



وزارة التعليم العالي والبحث العلمي  
جهاز الإشراف والتقويم العلمي  
دائرة ضمان الجودة والاعتماد الأكاديمي  
قسم الاعتماد

# دليل وصف البرنامج الأكاديمي والمقرر

٢٠٢٦-٢٠٢٥

## المقدمة :

يُعد البرنامج التعليمي بمثابة حزمة منسقة ومنظمة من المقررات الدراسية التي تشتمل على إجراءات وخبرات تنظم بشكل مفردات دراسية الغرض الأساس منها بناء وصقل مهارات الخريجين مما يجعلهم مؤهلين لتلبية متطلبات سوق العمل يتم مراجعته وتقييمه سنوياً عبر إجراءات وبرامج التدقيق الداخلي أو الخارجي مثل برنامج الممتحن الخارجي .

يقدم وصف البرنامج الأكاديمي ملخص موجز للسمات الرئيسة للبرنامج ومقرراته مبيناً المهارات التي يتم العمل على إكسابها للطلبة مبنية على وفق أهداف البرنامج الأكاديمي وتتجلى أهمية هذا الوصف لكونه يمثل الحجر الأساس في الحصول على الاعتماد البرامجي ويشترك في كتابته الملاكات التدريسية بإشراف اللجان العلمية في الأقسام العلمية .

ويتضمن هذا الدليل بنسخته الثانية وصفاً للبرنامج الأكاديمي بعد تحديث مفردات وفقرات الدليل السابق في ضوء مستجدات وتطورات النظام التعليمي في العراق والذي تضمن وصف البرنامج الأكاديمي بشكلها التقليدي نظام (سنوي، فصلي) فضلاً عن اعتماد وصف البرنامج الأكاديمي المعمم بموجب كتاب دائرة الدراسات ت م ٣/٢٩٠٦ في ٣/٥/٢٠٢٣ فيما يخص البرامج التي تعتمد مسار بولونيا أساساً لعملها .

وفي هذا المجال لا يسعنا إلا أن نؤكد على أهمية كتابة وصف البرامج الأكاديمية والمقررات الدراسية لضمان حسن سير العملية التعليمية .

## مفاهيم ومصطلحات:

وصف البرنامج الأكاديمي: يوفر وصف البرنامج الأكاديمي إيجازاً مقتضباً لرؤيته ورسالته وأهدافه متضمناً وصفاً دقيقاً لمخرجات التعلم المستهدفة على وفق استراتيجيات تعلم محددة .

وصف المقرر: يوفر إيجازاً مقتضباً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنناً عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ويكون مشتق من وصف البرنامج .

رؤية البرنامج: صورة طموحة لمستقبل البرنامج الأكاديمي ليكون برنامجاً متطوراً وملهماً ومحفزاً وواقعياً وقابلاً للتطبيق.

رسالة البرنامج: توضح الأهداف والأنشطة اللازمة لتحقيقها بشكل موجز كما يحدد مسارات تطور البرنامج واتجاهاته .

اهداف البرنامج: هي عبارات تصف ما ينوي البرنامج الأكاديمي تحقيقه خلال فترة زمنية محددة وتكون قابلة للقياس والملاحظة .

هيكلية المنهج كافة المقررات الدراسية / المواد الدراسية التي يتضمنها البرنامج الأكاديمي على وفق نظام التعلم المعتمد (فصلي سنوي، مسار (بولونيا سواء كانت متطلب (وزارة، جامعة كلية وقسم علمي) مع عدد الوحدات الدراسية .

مخرجات التعلم: مجموعة متوافقة من المعارف والمهارات والقيم التي اكتسبها الطالب بعد انتهاء البرنامج الأكاديمي بنجاح ويجب أن يُحدد مخرجات التعلم لكل مقرر بالشكل الذي يحقق أهداف البرنامج .

استراتيجيات التعليم والتعلم: بأنها الاستراتيجيات المستخدمة من قبل عضو هيئة التدريس لتطوير تعليم وتعلم الطالب وهي خطط يتم إتباعها للوصول إلى أهداف التعلم أي تصف جميع الأنشطة الصفية واللاصفية لتحقيق نتائج التعلم للبرنامج.

## نموذج وصف البرنامج الأكاديمي

اسم الجامعة: جامعة البصرة

الكلية/المعهد: كلية علوم الحاسوب وتكنولوجيا المعلومات

القسم العلمي: قسم الامن السيبراني

اسم البرنامج الأكاديمي او المهني: بكالوريوس / علوم الامن السيبراني

اسم الشهادة النهائية: بكالوريوس في علوم الامن السيبراني

النظام الدراسي : بولونيا

تاريخ اعداد الوصف : ٢٠٢٥/١١/٢٠

تاريخ ملء الملف: ٢٠٢٥/١١/٢٧



التوقيع:

اسم المعاون العلمي: د. احمد سالم فهد

التاريخ: ٢٠٢٦/٩/٢١

التوقيع:

اسم رئيس القسم: معالي محمد فهد

التاريخ: ٢٠٢٦/٩/٢١



دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي

التاريخ: ٢٠٢٦/٩/٢١

التوقيع

التوقيع



## ١. رؤية البرنامج

طموح القسم المحافظة على السمعة العلمية المتميزة المتأتية من امتلاك خريجي القسم المعرفة والمهارة والقدرة على التحليل في مجتمع المعلوماتية.

## ٢. رسالة البرنامج

ان يكون قسم الامن السيبراني مركزاً ريادياً في التعليم العالي والبحث العلمي، وان يكون مساهماً في رفد المجتمع بكوادر علمية مؤهلة تأهيلاً عالياً في اكتساب المعرفة.

## ٣. أهداف البرنامج

- 1-التطلع المستمر نحو التفوق المعرفي في التعليم والبحث العلمي والخدمة الاحترافية في مختلف العلوم
- 2-اعداد الطلبة لسوق العمل وتنمية قدراتهم على التفاعل والتواصل مع الاخرين من خلالالمشاركة الفعالة في برنامج التدريب الميداني.
- 3اكتساب المهارات لعرض الافكار والعمل ضمن فريق واحد وذلك من خلال مشاريع التخرج.
- 4-تأهيل الطلبة للدراسات العليا في مجال الامن السيبراني .
- 5-اعداد القيادات العلمية المتخصصة من خلال برنامج الدراسات العليا.

## ٤. الاعتماد البرامجي

## ٦. هيكلية البرنامج

| هيكل البرنامج   | عدد المقررات | وحدة دراسية | النسبة المئوية | ملاحظات * |
|-----------------|--------------|-------------|----------------|-----------|
| متطلبات المؤسسة | ٤            | ٨           | ١٦%            |           |
| متطلبات الكلية  | ٢            | ٤           | ٨%             |           |
| متطلبات القسم   | ٤٤           | ٣           | ٨٨%            |           |
| التدريب الصيفي  | ٤٠           | ٢           | ١٠٠%           |           |
| أخرى            |              |             |                |           |

\*ممكن أن تتضمن الملاحظات فيما إذا كان المقرر أساسي او اختياري.

| ٧. وصف البرنامج              |                      |                                    |                  |      |
|------------------------------|----------------------|------------------------------------|------------------|------|
| السنة/المستوى                | رمز المقرر أو المساق | اسم المقرر أو المساق               | الساعات المعتمدة |      |
|                              |                      |                                    | نظري             | عملي |
| السنة الاولى / الفصل الاول   | CyB101               | اساسيات البرمجة ١                  | 2                | 2    |
|                              | CyB102               | الهياكل المتقطعة                   | 3                |      |
|                              | CyB103               | تنظيم الحواسيب                     | 2                | 2    |
|                              | CyB104               | مبادئ امنية البيانات               | 3                |      |
|                              | UOB102               | اللغة الانكليزية ١                 | 2                |      |
|                              | CyB106               | الرياضيات                          | 3                |      |
|                              | UOB101               | الديمقراطية وحقوق الانسان          | 2                |      |
| السنة الاولى / الفصل الثاني  | CyB107               | اساسيات البرمجة ٢                  | 2                | 2    |
|                              | CyB108               | تصميم المنطق الرقمي                | 2                | 2    |
|                              | CyB109               | مبادئ الامن السيبراني              | 3                |      |
|                              | CyB110               | الترميز ونظرية المعلومات           | 2                |      |
|                              | UOB104               | اللغة العربية ١                    | 2                |      |
|                              | CyB112               | الاحتمالية والاحصاء                | 3                |      |
|                              | CyB201               | البرمجة الكيانية ١                 | 2                | 2    |
| السنة الثانية / الفصل الاول  | CyB202               | هياكل البيانات                     | 2                | 2    |
|                              | CyB203               | النظرية الاحتمالية                 | 3                |      |
|                              | CyB204               | اساسيات قواعد البيانات             | 2                | 2    |
|                              | CyB205               | برمجة المواقع الالكترونية الثابته  | 2                | 2    |
|                              | UOB204               | اللغة العربية ٢                    | 2                |      |
|                              | CyB206               | البرمجة الكيانية ٢                 | 2                | 2    |
|                              | CyB207               | تصميم وتحليل الخوارزميات           | 3                |      |
| السنة الثانية / الفصل الثاني | CyB208               | برمجة المواقع الالكترونية المتغيرة | 2                | 2    |
|                              | CyB209               | اساسيات التشفير                    | 3                |      |
|                              | UOB202               | جرائم البعث                        | 2                |      |
|                              | UOB201               | اللغة الانكليزية ٢                 | 2                |      |
|                              | CyB301               | التشفير المتقدم                    | 3                |      |
|                              | CyB302               | تطبيقات الهواتف النقالة            | 2                | 2    |
|                              | CyB303               | شبكات الحاسوب                      | 2                | 2    |
| السنة الثالثة / الفصل الاول  | CyB304               | أمنية المواقع الثابتة              | 2                | 2    |
|                              | CyB305               | الذكاء الاصطناعي                   | 3                |      |
|                              | CyB306               | التجارة الالكترونية و امنها        | 3                |      |
|                              | CyB307               | أمنية الهواتف النقالة              | 2                | 2    |
|                              | CyB308               | امنية شبكات الحاسوب                | 2                | 2    |
|                              | CyB309               | مبادئ الحوسبة السحابية             | 3                |      |
|                              | CyB310               | ادارة مخاطر المعلومات              | 3                |      |
| السنة الثالثة / الفصل الثاني | Cyb311               | بروتوكولات الاتصالات الامنة        | 3                |      |
|                              | CyB312               | شفرات خبيثة                        | 2                | 2    |

| ٨. مخرجات التعلم المتوقعة للبرنامج |
|------------------------------------|
| المعرفة                            |

### الاهداف المعرفية

١. اكساب الطلبة المعرفة والمهارات والسلوكيات اللازمة لتحليل مشاكل الامن السيبراني وتصميم الحلول المناسبة من خلال افضل الممارسات لتمكينهم من التميز والابداع وتأهيلهم لتبوء افضل المناصب في سوق العمل.
٢. القدرة على الابتكار مع الالتزام بالاطار المهني والقانوني والاخلاقي والعمل بفاعلية ضمن فرق عمل متعدد الاختصاصات.
٣. تمكين الطالب من التعلم الذاتي المستمر لمواصلة تعزيز مهاراتهم والتعرف على المستجدات المؤثرة في صناعة تقنيات الامن السيبراني وتبني تقنيات واساليب جديدة.
٤. تمكين الطلبة من تحليل ومناقشة النتائج باستعمال المعارف التي اكتسبها.
٥. زيادة خبرة الطلبة في كيفية التأكد من صحة التي وصلت اليه في البحث العلمي والاستنتاج.
٦. زيادة الخبرة المهنية للطلبة من خلال تطبيق المعارف والمهارات التي زودوا بها اثناء مدة التعليم.
٧. القدرة على الالتحاق في برامج الدراسات العليا في موضوعات الامن السيبراني وفي موضوعات اخرى.

### المهارات

#### الاهداف المهارتية الخاصة بالبرنامج

١. اكتساب المهارات الخاصة باساسيات البرمجة والشفير والامن الالكتروني.
٢. القدرة على اجراء الابحاث.

### القيم

#### الاهداف الوجدانية والقيمية

١. اكتساب المهارات الخاصة باسس علوم الحاسوب والتعاون وتشجيع روح العمل الجماعي.
٢. تعزيز القيم الاخلاقية لدى الطلبة فيما يتعلق بالانتماء واحترام النظام ومراعاة اللوائح والضوابط الادارية.
٣. غرس روح المبادرة والايجابية لدى الطلبة بما يناسب عملهم في المستقبل.
٤. تشجيع الطلبة على المشاركة في الانشطة اللاصفية والتطوعية والمجتمعية.
٥. تعزيز قيم المواطنة والهوية والايثار

### ٩. استراتيجيات التعليم والتعلم

١. لقاء المحاضرات النظرية والتطبيقية . واستعمال الكتب المنهجية. والكتب المساعدة. والوسائل الحديثة في التعلم.
٢. اكتساب الطلبة مهارات اساسية في الحاسوب والتعلم الالكتروني. وتوظيف الاجهزة الاحديثة في عملية التعلم.
٣. اعطاء الطلبة الحرية الكافية في اختيار موضوعات بحوث التخرج. لاستخراج طاقاتهم الفكرية. والكشف عن اهتماماتهم و ميولهم العلمية.
٤. منح الطلبة الفرصة في طرح الافكار اثناء الحاضرات. وافساح المجال امامهم للمناقشة وابداء الرأي. وتحليل البيانات والتوصل الى الاستنتاجات.

### ١٠. طرائق التقييم

١. الامتحانات الالكترونية.
٢. الامتحانات المركزية والشهرية.

٣. الامتحانات اليومية.
٤. الواجبات اليومية.
٥. التقارير العلمية.
٦. الامتحانات المختبرية الحاسوبية.
٧. مشاريع التخرج.

## ١١. الهيئة التدريسية

### أعضاء هيئة التدريس

| الرتبة العلمية |             | التخصص              |     | المتطلبات/ المهارات<br>الخاصة (ان وجدت) |  | اعداد الهيئة التدريسية |       |
|----------------|-------------|---------------------|-----|-----------------------------------------|--|------------------------|-------|
|                |             | عام                 | خاص |                                         |  | ملاك                   | محاضر |
| استاذ          | علوم حاسبات | امنية الشبكات       |     |                                         |  | 1                      |       |
| استاذ          | علوم حاسبات | تشفير البيانات      |     |                                         |  | 1                      |       |
| استاذ          | علوم حاسبات | هندسة البرمجيات     |     |                                         |  | 1                      |       |
| استاذ مساعد    | علوم حاسبات | شبكات حاسوب         |     |                                         |  | 1                      |       |
| استاذ مساعد    | علوم حاسبات | امنية بيانات        |     |                                         |  | 1                      |       |
| استاذ مساعد    | علوم حاسبات | مكامن وتنقيب بيانات |     |                                         |  | 1                      |       |
| مدرس           | علوم حاسبات | شبكات حاسوب         |     |                                         |  | 3                      |       |
| مدرس مساعد     | علوم حاسبات | -                   |     |                                         |  | 7                      |       |

### التطوير المهني

#### توجيه أعضاء هيئة التدريس الجدد

١. التعليم الالكتروني.
٢. استخدام وسائل الانترنت.
٣. استخدام وسائل التواصل الحديثة.
٤. استخدام وسائل الاتصال الحديثة. ٥. نشاطات لا صفية.
٥. دورات تدريبية متطورة في تعلم البرامج الحديثة.
٦. الاستشارات العلمية وسبل تطورها وتطبيقها في مختلف المجالات.

#### التطوير المهني لأعضاء هيئة التدريس

تصف بايجاز خطة وترتيبات التطور الاكاديمي والمهني لأعضاء هيئة التدريس كأستراتيجيات التدريس والتعلم، وتقييم نتائج التعلم، التطوير المهني وما الى ذلك

## ١٢. معيار القبول

١. القبول المركزي في وزارة التعليم العالي والبحث العلمي.
٢. معدل الطالب ضمن قوائم القبول المركزي باستثناء أبناء التدريسيين وأبناء الشهداء والامتيازات التي تنص عليها التعليمات الخاصة بالوزارة حيث يتم قبولهم حسب الرغبة لتوزيعهم على الأقسام العلمية.

### ١٣. أهم مصادر المعلومات عن البرنامج

مصادر وزارة التعليم العالي والبحث العلمي. مصادر الجامعات المحلية والعالمية.

### ١٤. خطة تطوير البرنامج

تنمية قدرات الطلبة في البحث والتقصي من خلال حضور المناقشات. وكتابة البحوث العلمية التخصصية. وتنمية قدرات الاستنتاج. والحث على زيارة المكتبة اسبوعياً. للاطلاع على المصادر والكتب والمجلات العلمية, بوصفها جميعاً مواتر للحصول على المعلومات , فضلاً عن استعانة الطلبة بشبكات الانترنت والتعليم الالكتروني والحاسوبي , والمراجع الالكترونية , والمواقع العلمية المتخصصة.

| مخطط مهارات البرنامج               |    |    |    |          |    |    |    |         |    |    |    |                  |                           |            |                                |
|------------------------------------|----|----|----|----------|----|----|----|---------|----|----|----|------------------|---------------------------|------------|--------------------------------|
| مخرجات التعلم المطلوبة من البرنامج |    |    |    |          |    |    |    |         |    |    |    |                  |                           |            |                                |
| القيم                              |    |    |    | المهارات |    |    |    | المعرفة |    |    |    | أساسي أم اختياري | اسم المقرر                | رمز المقرر | السنة/المستوى                  |
| ج٤                                 | ج٣ | ج٢ | ج١ | ب٤       | ب٣ | ب٢ | ب١ | أ٤      | أ٣ | أ٢ | أ١ |                  |                           |            |                                |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | رئيسي            | اساسيات البرمجة ١         | CyB101     | السنة الاولى /<br>الفصل الاول  |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | اساسي            | الهياكل المتقطعة          | CyB102     |                                |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | اساسي            | تنظيم الحواسيب            | CyB103     |                                |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | اساسي            | مبادئ امنية البيانات      | CyB104     |                                |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | اساسي            | اللغة الانكليزية ١        | UOB102     |                                |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | داعم             | الرياضيات                 | CyB106     |                                |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | اختياري          | الديمقراطية وحقوق الانسان | UOB101     |                                |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | رئيسي            | اساسيات البرمجة ٢         | CyB107     | السنة الاولى /<br>الفصل الثاني |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | اساسي            | تصميم المنطق الرقمي       | CyB108     |                                |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | اساسي            | مبادئ الامن السيبراني     | CyB109     |                                |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | اساسي            | الترميز ونظرية المعلومات  | CyB110     |                                |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | اساسي            | اللغة العربية ١           | UOB104     |                                |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | داعم             | الاحتمالية والاحصاء       | CyB112     |                                |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | رئيسي            | البرمجة الكيانية ١        | CyB201     | السنة الثانية /<br>الفصل الاول |
| ✓                                  | ✓  | ✓  | ✓  | ✓        | ✓  | ✓  | ✓  | ✓       | ✓  | ✓  | ✓  | اساسي            | هياكل البيانات            | CyB202     |                                |

|   |   |   |   |   |   |   |   |   |   |   |   |       |                                    |        |                                 |
|---|---|---|---|---|---|---|---|---|---|---|---|-------|------------------------------------|--------|---------------------------------|
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | النظرية الاحتمالية                 | CyB203 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | اساسيات قواعد البيانات             | CyB204 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | برمجة المواقع الالكترونية الثابتة  | CyB205 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | اللغة العربية ٢                    | UOB204 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | رئيسي | البرمجة الكيانية ٢                 | CyB206 | السنة الثانية /<br>الفصل الثاني |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | تصميم وتحليل الخوارزميات           | CyB207 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | برمجة المواقع الالكترونية المتغيرة | CyB208 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | اساسيات التشفير                    | CyB209 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | جرائم البعث                        | UOB202 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | اللغة الانكليزية ٢                 | UOB201 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | رئيسي | التشفير المتقدم                    | CyB301 | السنة الثالثة /<br>الفصل الاول  |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | تطبيقات الهواتف النقالة            | CyB302 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | شيكات الحاسوب                      | CyB303 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | أمنية المواقع الثابتة              | CyB304 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | الذكاء الاصطناعي                   | CyB305 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | التجارة الالكترونية و امنها        | CyB306 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | أمنية الهواتف النقالة              | CyB307 | السنة الثالثة /<br>الفصل الثاني |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | امنية شبكات الحاسوب                | CyB308 |                                 |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | مبادئ الحوسبة السحابية             | CyB309 |                                 |

|   |   |   |   |   |   |   |   |   |   |   |   |       |                             |        |  |
|---|---|---|---|---|---|---|---|---|---|---|---|-------|-----------------------------|--------|--|
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | ادارة مخاطر المعلومات       | CyB310 |  |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | بروتوكولات الاتصالات الامنة | Cyb311 |  |
| ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | اساسي | شفرات خبيثة                 | CyB312 |  |

● يرجى وضع أشاره في المربعات المقابلة لمخرجات التعلم الفردية من البرنامج الخاضعة للتقييم



# Curriculum for the first Year, First Semester.

## Module 1

### MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

| <b>Module Information</b><br>معلومات المادة الدراسية |                               |              |  |                                                                                                                                                                                                                                                                         |        |
|------------------------------------------------------|-------------------------------|--------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| <b>Module Title</b>                                  | <b>Computer Programming I</b> |              |  | <b>Module Delivery</b>                                                                                                                                                                                                                                                  |        |
| <b>Module Type</b>                                   | Core                          |              |  | <input checked="" type="checkbox"/> Theory<br><br><input type="checkbox"/> Lecture<br><br><input checked="" type="checkbox"/> Lab<br><br><input checked="" type="checkbox"/> Tutorial<br><br><input type="checkbox"/> Practical<br><br><input type="checkbox"/> Seminar |        |
| <b>Module Code</b>                                   | CyB 101                       |              |  |                                                                                                                                                                                                                                                                         |        |
| <b>ECTS Credits</b>                                  | 7                             |              |  |                                                                                                                                                                                                                                                                         |        |
| <b>SWL (hr/sem)</b>                                  | 175                           |              |  |                                                                                                                                                                                                                                                                         |        |
| <b>Module Level</b>                                  |                               | UC           |  | <b>Semester of Delivery</b>                                                                                                                                                                                                                                             |        |
| <b>Administering Department</b>                      |                               | CyB          |  | <b>College</b>                                                                                                                                                                                                                                                          | CSIS   |
| <b>Module Leader</b>                                 | Dr. Haider                    |              |  | <b>e-mail</b>                                                                                                                                                                                                                                                           |        |
| <b>Module Leader's Acad. Title</b>                   |                               | Assist Proff |  | <b>Module Leader's Qualification</b>                                                                                                                                                                                                                                    |        |
|                                                      |                               |              |  | PHD                                                                                                                                                                                                                                                                     |        |
| <b>Module Tutor</b>                                  | Name (if available)           |              |  | <b>e-mail</b>                                                                                                                                                                                                                                                           | E-mail |
| <b>Peer Reviewer Name</b>                            |                               | Name         |  | <b>e-mail</b>                                                                                                                                                                                                                                                           | E-mail |
| <b>Scientific Committee Approval Date</b>            |                               |              |  | <b>Version Number</b>                                                                                                                                                                                                                                                   | 1.0    |

| <b>Relation with other Modules</b><br>العلاقة مع المواد الدراسية الأخرى |      |  |                 |
|-------------------------------------------------------------------------|------|--|-----------------|
| <b>Prerequisite module</b>                                              | None |  | <b>Semester</b> |
|                                                                         |      |  |                 |

|                      |                                |          |           |
|----------------------|--------------------------------|----------|-----------|
| Co-requisites module | CyB107 Computer Programming II | Semester | 2/Level 1 |
|----------------------|--------------------------------|----------|-----------|

| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br><b>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b><br><b>أهداف المادة الدراسية</b>                                                                         | <p>1. Gaining knowledge of programming languages offers valuable insights into various other domains and disciplines..</p> <p>2. Acquiring proficiency in the effective and responsible utilization and administration of programming languages is crucial for managers and other professionals in today's interconnected global information-driven society.</p> <p>3. Learn that people must understand the components of programming language and how all of these components work together to bring value to an organization.</p> <p>4. We need to direct our attention to the role that programming languages play in today's interconnected global information society.</p> <p>5. The competitiveness of many companies relies significantly on the efficient utilization of information systems. Consequently, we need to consider the potential benefits and drawbacks that integrating information systems can bring to both businesses and society.</p> <p>6. what is a programming language ? A language is a group of interrelated statement working together toward a common goal by accepting inputs and producing outputs in an organized transformation process</p> <p>7. why learning algorithm?</p> <p>8. why learning Flow chart?</p> <p>9. Why learn about Basic input/output?</p> <p>10. Why learn about loop type?<br/>- for..loop<br/>- while..loop</p> <p>11. Why Learn about functions?<br/>- Defining a Function, Calling a Function, Function Arguments(Call by value, Call by Reference)</p> |
| <b>Module Learning Outcomes</b>                                                                                                  | <p>1- Provide the student with the essential skills required to excel in the Python programming language. Python power users possess a comprehensive grasp of the language and can discern the most appropriate tools or functions for specific situations.</p> <p>2- Acquire crucial skills for working with both basic 'if' statements and</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

|                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| مخرجات التعلم للمادة الدراسية                                | <p>nested 'if' statements.</p> <p>Gain essential skills for handling 'for' statements and nested 'for' statements, which are types of loops. -3</p> <p>Acquire proficiency in writing and utilizing the essential functions. -4</p>                                                                                                                                                                                                                                                        |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p> | <p>Indicative content includes the following.</p> <p><u>Principles of Python Language</u> -</p> <p>How can use Python program , entering of variable types , basic input/output statement, and type of operators.</p> <p>IF TYPE -</p> <p>If statement,nested if statement.</p> <p><u>LOOP TYPES</u> -</p> <p>For loop,nested for loop ,while,do while .</p> <p><u>Function</u> -</p> <p>Defining a Function, Calling a Function, Function Arguments(Call by value, Call by Reference)</p> |

| Learning and Teaching Strategies        |                                                                                                                                                                                                                                                                                                                                                                                                            |                                      |   |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---|
| استراتيجيات التعلم والتعليم             |                                                                                                                                                                                                                                                                                                                                                                                                            |                                      |   |
| Strategies                              | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and the lab, interactive tutorials, and by considering types of simple experiments involving some sampling activities that are interesting to the students. |                                      |   |
| Student Workload (SWL)                  |                                                                                                                                                                                                                                                                                                                                                                                                            |                                      |   |
| الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا |                                                                                                                                                                                                                                                                                                                                                                                                            |                                      |   |
| Structured SWL (h/sem)                  |                                                                                                                                                                                                                                                                                                                                                                                                            | Structured SWL (h/w)                 |   |
| الحمل الدراسي المنتظم للطالب خلال الفصل | 79                                                                                                                                                                                                                                                                                                                                                                                                         | الحمل الدراسي المنتظم للطالب أسبوعيا | 5 |

|                                                                                |            |                                                                           |     |
|--------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------|-----|
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 96         | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 6.4 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | <b>175</b> |                                                                           |     |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                        |             |                  |            |                           |
|---------------------------------------------------|------------------------|-------------|------------------|------------|---------------------------|
|                                                   |                        | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | <b>Quizzes</b>         | 2           | 10% (10)         | 5 and 10   | LO #1, #2 and #10, #11    |
|                                                   | <b>Assignments</b>     | 2           | 10% (10)         | 2 and 12   | LO #3, #4 and #6, #7      |
|                                                   | <b>Projects / Lab.</b> | 1           | 10% (10)         | Continuous | All                       |
|                                                   | <b>Report</b>          | 1           | 10% (10)         | 13         | LO #5, #8 and #10         |
| <b>Summative assessment</b>                       | <b>Midterm Exam</b>    | 2hr         | 10% (10)         | 7          | LO #1 - #7                |
|                                                   | <b>Final Exam</b>      | 3hr         | 50% (50)         | 16         | All                       |
| <b>Total assessment</b>                           |                        |             | 100% (100 Marks) |            |                           |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                               |
|-------------------------------------------------------------------|-----------------------------------------------|
|                                                                   | <b>Material Covered</b>                       |
| <b>Week 1</b>                                                     | Introduction to Computer Programming language |
| <b>Week 2</b>                                                     | Algorithm Design                              |
| <b>Week 3</b>                                                     | Flowcharts                                    |
| <b>Week 4</b>                                                     | COMMENTS                                      |
| <b>Week 5</b>                                                     | DATA TYPES                                    |

|                |                            |
|----------------|----------------------------|
| <b>Week 6</b>  | VARIABLE TYPES             |
| <b>Week 7</b>  | CONSTANTS/LITERALS         |
| <b>Week 8</b>  | BASIC INPUT/OUTPUT         |
| <b>Week 9</b>  | OPERATORS                  |
| <b>Week 10</b> | DECISION-MAKING STATEMENTS |
| <b>Week 11</b> | LOOP TYPES (for ..loop)    |
| <b>Week 12</b> | LOOP TYPES(while..loop)    |
| <b>Week 13</b> | LOOP TYPES(Do..while loop) |
| <b>Week 14</b> | FUNCTIONS                  |
| <b>Week 15</b> | FUNCTIONS(void)            |
| <b>Week 16</b> | Exam                       |

| Delivery Plan (Weekly Lab. Syllabus) |                                                               |
|--------------------------------------|---------------------------------------------------------------|
| المنهاج الاسبوعي للمختبر             |                                                               |
|                                      | Material Covered                                              |
| <b>Week 1</b>                        | Lab 1: learning how can use program Python                    |
| <b>Week 2</b>                        | Lab 2: execute many examples of statements BASIC INPUT/OUTPUT |
| <b>Week 3</b>                        | Lab 3: execute many examples of VARIABLE TYPES                |
| <b>Week 4</b>                        | Lab 4: execute many examples of if statement                  |
| <b>Week 5</b>                        | Lab 5: execute many examples of nested if statement           |
| <b>Week 6</b>                        | Lab 6: execute many examples of switch statement              |
| <b>Week 7</b>                        | Lab 7: execute many examples of for..loop statement           |
| <b>Week 8</b>                        | Lab 8 execute many examples of for..loop statement            |
| <b>Week 9</b>                        | Lab9: execute many examples of nested for..loop statement     |

|                |                                                             |
|----------------|-------------------------------------------------------------|
| <b>Week 10</b> | Lab 10: execute many examples of nested for..loop statement |
| <b>Week 11</b> | Lab 11: execute many examples of While..loop statement      |
| <b>Week 12</b> | Lab 12: execute many examples of Do..While..loop statement  |
| <b>Week 13</b> | Lab 13:execute many examples of functions                   |
| <b>Week 14</b> | Lab 14: execute many examples of functions(void)            |
| <b>Week 15</b> | Lab15: execute many examples of functions(void)             |

### Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                                                    | Available in the Library? |
|--------------------------|---------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | <b>Python Programming</b> by Adam Steward - 2022                                                        | No                        |
| <b>Recommended Texts</b> | <b>Python Programming</b> : An Introduction to Computer Science : Second Edition 2009                   | No                        |
| <b>Websites</b>          | <a href="https://www.guru99.com/python-tutorials.html">https://www.guru99.com/python-tutorials.html</a> |                           |

### Grading Scheme

مخطط الدرجات

| Group                              | Grade                   | التقدير             | Marks %  | Definition                            |
|------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| <b>Success Group</b><br>(50 - 100) | <b>A – Excellent</b>    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                    | <b>B - Very Good</b>    | جيد جدا             | 80 – 89  | Above average with some errors        |
|                                    | <b>C – Good</b>         | جيد                 | 70 – 79  | Sound work with notable errors        |
|                                    | <b>D - Satisfactory</b> | متوسط               | 60 – 69  | Fair but with major shortcomings      |
|                                    | <b>E – Sufficient</b>   | مقبول               | 50 – 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)      | <b>FX – Fail</b>        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                    | <b>F – Fail</b>         | راسب                | (0-44)   | Considerable amount of work required  |
|                                    |                         |                     |          |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 2

### MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية |                     |                      |                                                                                                                                                                                                                                          |        |
|-----------------------------------------------|---------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Module Title                                  | Discrete Structures |                      | Module Delivery                                                                                                                                                                                                                          |        |
| Module Type                                   | Core                |                      | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |        |
| Module Code                                   | CyS102              |                      |                                                                                                                                                                                                                                          |        |
| ECTS Credits                                  | 5                   |                      |                                                                                                                                                                                                                                          |        |
| SWL (hr/sem)                                  | 125                 |                      |                                                                                                                                                                                                                                          |        |
| Module Level                                  | UGx11 1             | Semester of Delivery |                                                                                                                                                                                                                                          |        |
| Administering Department                      | CyS                 | College              | College of Computer Science and Information Technology                                                                                                                                                                                   |        |
| Module Leader                                 |                     |                      | e-mail                                                                                                                                                                                                                                   |        |
| Module Leader's Acad. Title                   |                     |                      | Module Leader's Qualification                                                                                                                                                                                                            |        |
| Module Tutor                                  | Name (if available) |                      | e-mail                                                                                                                                                                                                                                   | E-mail |
| Peer Reviewer Name                            | Name                |                      | e-mail                                                                                                                                                                                                                                   | E-mail |
| Scientific Committee Approval Date            | 01/10/2023          | Version Number       | 1.0                                                                                                                                                                                                                                      |        |

### Relation with other Modules

| العلاقة مع المواد الدراسية الأخرى |      |          |  |
|-----------------------------------|------|----------|--|
| Prerequisite module               | None | Semester |  |
| Co-requisites module              | None | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Module Objectives</b><br>أهداف المادة الدراسية                | This course aims at teaching students how to think mathematically. Students will learn a set of mathematical facts and techniques as well as some major discrete structures that related with computers. They will also learn how to use these facts, techniques and discrete structures to design computer-based solutions for real life problems.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <ol style="list-style-type: none"> <li>Developing the acquisition of some acquired skills from inflammation <ol style="list-style-type: none"> <li>Everyday life.</li> </ol> </li> <li>Developing mathematical skills (skills that help form mathematical sense) skills Estimation, mental calculation, judging the reasonableness of the results, etc.).</li> <li>Acquiring various methods of conducting operations.</li> <li>Develop the ability to seriously classify and collect numerous data, tabulate and read them representation and interpretation.</li> <li>Students should understand relations, equivalence relations, and partial orders.</li> <li>Students should develop problem-solving skills related to the design and analysis of algorithms.</li> </ol>                                                                                                                                                            |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | <ol style="list-style-type: none"> <li>Understanding of Fundamental Concepts: <ul style="list-style-type: none"> <li>Demonstrating a solid understanding of foundational concepts in discrete mathematics, such as set theory, propositional and first-order logic, and mathematical proof techniques.</li> </ul> </li> <li>Combinatorial Problem Solving: <ul style="list-style-type: none"> <li>Solving combinatorial problems by applying techniques like permutations, combinations, binomial coefficients, and counting principles.</li> <li>Analyzing and solving problems using the Pigeonhole Principle and the principle of Inclusion-Exclusion.</li> </ul> </li> <li>Mastery of Graph Theory: <ul style="list-style-type: none"> <li>Demonstrating proficiency in graph theory, including the ability to define and work with graphs, trees, paths, cycles, connectivity, and various graph algorithms.</li> </ul> </li> </ol> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>○ Solving real-world problems using graph theory, like network design, shortest path algorithms, and matching problems.</li> </ul> <p>4. Application to Computer Science:</p> <ul style="list-style-type: none"> <li>○ Applying discrete structures concepts to computer science, such as understanding finite state machines, formal languages, regular expressions, and context-free grammars.</li> <li>○ Designing and analyzing algorithms based on discrete mathematics principles.</li> </ul> <p>5. Relations and Functions:</p> <ul style="list-style-type: none"> <li>○ Understanding relations, equivalence relations, and partial orders, and being able to apply them to solve problems.</li> <li>○ Working with functions, including injective, surjective, and bijective functions, and understanding their properties.</li> </ul> <p>6. Proof and Mathematical Rigor:</p> <ul style="list-style-type: none"> <li>○ Demonstrating the ability to construct clear and rigorous mathematical proofs using techniques like mathematical induction, proof by contradiction, and direct proof.</li> </ul> <p>7. Algorithm Analysis:</p> <ul style="list-style-type: none"> <li>○ Analyzing the time and space complexity of algorithms.</li> <li>○ Understanding the basics of computational complexity theory, such as classifying problems into P, NP, and NP-complete.</li> </ul> <p>8. Problem-Solving Skills:</p> <ul style="list-style-type: none"> <li>○ Developing problem-solving skills by applying discrete mathematics concepts to a wide range of practical and theoretical problems.</li> <li>○ Formulating and solving mathematical and algorithmic problems.</li> </ul> <p>9. Application to Diverse Fields:</p> <ul style="list-style-type: none"> <li>○ Recognizing how discrete structures are applied in various fields, such as computer science, cryptography, network design, and operations research.</li> </ul> <p>10. Mathematical Modeling:</p> <ul style="list-style-type: none"> <li>○ Using discrete structures to model and analyze real-world scenarios, including optimization problems, scheduling, and decision-making.</li> </ul> <p>11. Critical Thinking and Abstraction:</p> <ul style="list-style-type: none"> <li>○ Developing critical thinking skills and the ability to abstract complex problems into simpler, discrete structures for analysis.</li> <li>○ These indicative outcomes reflect the knowledge and skills that students typically gain from a course in discrete structures. Depending on the course's depth and specific focus, these outcomes may be adjusted or expanded to suit the learning objectives of the program or institution.</li> </ul> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by solving exercises. |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Student Workload (SWL)

### الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا

|                                                                                |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       | 64  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       | 4.2 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 61  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 4   |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | 125 |                                                                           |     |

## Module Evaluation

### تقييم المادة الدراسية

|                             |                     | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|-----------------------------|---------------------|-------------|------------------|----------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>      | 2           | 20% (10)         | 5 and 10 | LO #1, #2 and #4          |
|                             | <b>Assignments</b>  | 2           | 20% (10)         | 2 and 12 | LO #1, #3                 |
| <b>Summative assessment</b> | <b>Midterm Exam</b> | 2hr         | 10% (10)         | 7        | LO #1 - #5                |
|                             | <b>Final Exam</b>   | 3hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>     |                     |             | 100% (100 Marks) |          |                           |

## Delivery Plan (Weekly Syllabus)

|        | Material Covered                                                                                                                                                                                              |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Week 1 | <ul style="list-style-type: none"> <li>• Sets</li> <li>• Subsets</li> <li>• Operations on sets</li> <li>• Computer Representation of Sets</li> </ul>                                                          |
| Week 2 | <ul style="list-style-type: none"> <li>• Cartesian product</li> <li>• Sequences</li> <li>• Properties of Integers</li> </ul>                                                                                  |
| Week 3 | <ul style="list-style-type: none"> <li>• Matrices</li> <li>• Propositional and Logical Operations</li> <li>• Conditional Statements</li> </ul>                                                                |
| Week 4 | <ul style="list-style-type: none"> <li>• Conditional Statements</li> <li>• Mathematical Induction</li> <li>• Product sets and Partitions</li> </ul>                                                           |
| Week 5 | <ul style="list-style-type: none"> <li>• Methods of Proving Theorems</li> <li>• Recursive</li> <li>• Relations</li> </ul>                                                                                     |
| Week 6 | <ul style="list-style-type: none"> <li>• Properties of Relations</li> <li>• Operations Relations</li> <li>• Computer Representation of Relations</li> </ul>                                                   |
| Week 7 | <ul style="list-style-type: none"> <li>• Properties of Relations</li> <li>• Equivalence Relations</li> <li>• Computer Representation of Relations and Digraphs</li> <li>• Operations and Relations</li> </ul> |
| Week 8 | <ul style="list-style-type: none"> <li>• Functions</li> <li>• Functions for Computer Science</li> <li>• Domain and codomain of the function</li> </ul>                                                        |

|                |                                                                                                                                                               |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 9</b>  | <ul style="list-style-type: none"> <li>• Range of the function</li> <li>• Graph of function</li> <li>• Functions types</li> </ul>                             |
| <b>Week 10</b> | <ul style="list-style-type: none"> <li>• Permutation Functions</li> <li>• Graph</li> <li>• The types of graphs</li> </ul>                                     |
| <b>Week 11</b> | <ul style="list-style-type: none"> <li>• Some Special Simple Graphs</li> <li>• Representing Graphs</li> <li>• Isomorphism and Isomorphic of graphs</li> </ul> |
| <b>Week 12</b> | <ul style="list-style-type: none"> <li>• Common graphs</li> <li>• Some important concepts</li> </ul>                                                          |
| <b>Week 13</b> | <ul style="list-style-type: none"> <li>• Kinds of graphs</li> <li>• More graphs</li> </ul>                                                                    |
| <b>Week 14</b> | <ul style="list-style-type: none"> <li>• Trees</li> <li>• Labeled Trees</li> </ul>                                                                            |
| <b>Week 15</b> | <ul style="list-style-type: none"> <li>• Tree Searching</li> <li>• Undirected Trees</li> </ul>                                                                |
| <b>Week 16</b> | <ul style="list-style-type: none"> <li>• Tree Traversal</li> <li>• Traversal Algorithms</li> <li>• Infix, Prefix, and Postfix Notation</li> </ul>             |

| Learning and Teaching Resources |                                                                                          |                           |
|---------------------------------|------------------------------------------------------------------------------------------|---------------------------|
| مصادر التعلم والتدريس           |                                                                                          |                           |
|                                 | Text                                                                                     | Available in the Library? |
| <b>Required Texts</b>           | Kolman, Busby, and Ross (2008). Discrete Mathematical Structures, 6th ed. Prentice Hall. | Yes                       |
| <b>Recommended Texts</b>        | Kenneth Rosen (2012). Discrete Mathematics and Its Applications, 7th ed. Mc-Graw Hill.   | No                        |

|          |  |
|----------|--|
| Websites |  |
|----------|--|

| Grading Scheme<br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                              |                         |                     |          |                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                       | Grade                   | التقدير             | Marks %  | Definition                            |
| <b>Success Group</b><br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                          | <b>A</b> - Excellent    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>B</b> - Very Good    | جيد جدا             | 80 – 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>C</b> - Good         | جيد                 | 70 – 79  | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>D</b> - Satisfactory | متوسط               | 60 – 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>E</b> - Sufficient   | مقبول               | 50 – 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                               | <b>FX</b> – Fail        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>F</b> – Fail         | راسب                | (0-44)   | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                         |                     |          |                                       |
| <p><b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.</p> |                         |                     |          |                                       |

## Module 3

### MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية |                              |                 |
|-----------------------------------------------|------------------------------|-----------------|
| Module Title                                  | <b>Computer Organization</b> | Module Delivery |

|                                    |                     |                               |                                                                                                                                                                                                                                                     |  |
|------------------------------------|---------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Module Type                        | Basic               |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input checked="" type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Code                        | CyS103              |                               |                                                                                                                                                                                                                                                     |  |
| ECTS Credits                       | 5                   |                               |                                                                                                                                                                                                                                                     |  |
| SWL (hr/sem)                       | 125                 |                               |                                                                                                                                                                                                                                                     |  |
| Module Level                       | 1                   | Semester of Delivery          | 1                                                                                                                                                                                                                                                   |  |
| Administering Department           | CyS                 | College                       | College of Computer Science and Information Technology                                                                                                                                                                                              |  |
| Module Leader                      |                     |                               | e-mail                                                                                                                                                                                                                                              |  |
| Module Leader's Acad. Title        | Assist Proff        | Module Leader's Qualification | PHD                                                                                                                                                                                                                                                 |  |
| Module Tutor                       | Name (if available) | e-mail                        | E-mail                                                                                                                                                                                                                                              |  |
| Peer Reviewer Name                 | Name                | e-mail                        | E-mail                                                                                                                                                                                                                                              |  |
| Scientific Committee Approval Date | 1/10/2023           | Version Number                | 1.0                                                                                                                                                                                                                                                 |  |

|                                                                                                                           |      |          |  |
|---------------------------------------------------------------------------------------------------------------------------|------|----------|--|
| <b>Relation with other Modules</b><br>العلاقة مع المواد الدراسية الأخرى                                                   |      |          |  |
| Prerequisite module                                                                                                       | None | Semester |  |
| Co-requisites module                                                                                                      |      | Semester |  |
| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |      |          |  |

|                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Objectives</b><br/>أهداف المادة الدراسية</p>                | <ol style="list-style-type: none"> <li>1. Understand Computer Organization: Explain the significance of computer organization in the context of computing systems and recognize its historical development.</li> <li>2. Central Processing Unit (CPU): Identify the key components of a CPU, describe the CPU instruction execution cycle, and utilize Python for simulating CPU behavior.</li> <li>3. Memory Systems: Analyze memory hierarchy, comprehend memory organization and addressing modes, and create simulations of memory systems using Python.</li> <li>4. Assembly Language Programming: Familiarize themselves with assembly language, particularly MIPS assembly, and develop proficiency in writing, debugging, and simulating assembly programs using Python.</li> <li>5. Input/Output (I/O) and Peripherals: Examine I/O organization, device controllers, and communication mechanisms, and simulate I/O operations using Python.</li> <li>6. Computer Arithmetic: Understand binary and floating-point arithmetic, explore arithmetic operations in the Arithmetic and Logic Unit (ALU), and implement basic arithmetic operations using Python.</li> <li>7. Software-Hardware Interface: Analyze the interface between software and hardware, interpret software instructions' execution on hardware, and conduct Python-based simulations of hardware interactions.</li> </ol> |
| <p><b>Module Learning Outcomes</b><br/>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>1. Explain the historical development and significance of computer organization.</li> <li>2. Describe the components of a CPU, including the ALU, control unit, and registers, and understand the CPU's instruction execution cycle.</li> <li>3. Create Python simulations to model CPU behavior.</li> <li>4. Define the memory hierarchy, address modes, and organization, and develop Python-based memory system simulations.</li> <li>5. Write, debug, and simulate assembly language programs, specifically in MIPS assembly, using Python.</li> <li>6. Simulate I/O operations and understand I/O organization and device communication mechanisms.</li> <li>7. Perform binary and floating-point arithmetic, implement basic arithmetic operations in Python, and comprehend the role of the ALU.</li> <li>8. Develop Python simulations to illustrate software-hardware interactions.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p><b>Indicative Contents</b><br/>المحتويات الإرشادية</p>                | <p>Indicative content includes the following.</p> <ul style="list-style-type: none"> <li>- <u>Principles of about low level Programming</u><br/>How can Python program be used simulate low level programming.</li> <li>- How Hardware interacts with software during operation</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

|  |                                                                                                                                                    |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>- The difference between Processes</li> <li>- How programming designers improve the performance.</li> </ul> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------|

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and the lab, interactive tutorials, and by considering types of simple experiments involving some sampling activities that are interesting to the students. |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

|                                                                                |            |                                                                           |     |
|--------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 64         | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4.2 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 61         | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4   |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | <b>125</b> |                                                                           |     |

## Module Evaluation

تقييم المادة الدراسية

|                             |                     | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
|-----------------------------|---------------------|-------------|------------------|------------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>      | 2           | 10% (10)         | 5 and 10   | LO #1, #2 and #10, #11    |
|                             | <b>Assignments</b>  | 2           | 10% (10)         | 2 and 12   | LO #2-#8                  |
|                             | <b>Lab</b>          | 1           | 10% (10)         | Continuous | All                       |
|                             | <b>Report</b>       | 1           | 10% (10)         | 13         | LO #1, #2, #3             |
| <b>Summative assessment</b> | <b>Midterm Exam</b> | 2hr         | 10% (10)         | 7          | LO #1 - #7                |
|                             | <b>Final Exam</b>   | 3hr         | 50% (50)         | 16         | All                       |
| <b>Total assessment</b>     |                     |             | 100% (100 Marks) |            |                           |

## Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

|                | Material Covered                                                                                            |
|----------------|-------------------------------------------------------------------------------------------------------------|
| <b>Week 1</b>  | Introduction to Computer Organization                                                                       |
| <b>Week 2</b>  | Historical development of computer architecture and the role of computer organization in computing systems. |
| <b>Week 3</b>  | Components of the CPU: ALU, control unit, registers, CPU operation and the instruction execution cycle.     |
| <b>Week 4</b>  | Introduction to Python and its role in simulating CPU behavior.                                             |
| <b>Week 5</b>  | Memory hierarchy: primary (RAM, ROM), cache, secondary storage, memory organization and addressing modes.   |
| <b>Week 6</b>  | Simulating memory systems using Python.                                                                     |
| <b>Week 7</b>  | Introduction to assembly language. MIPS assembly language: syntax, instructions, addressing modes.          |
| <b>Week 8</b>  | Writing and debugging simple assembly programs using Python.                                                |
| <b>Week 9</b>  | Input/Output (I/O) and Peripherals: I/O organization and interfacing. Device controllers and communication. |
| <b>Week 10</b> | Simulating I/O operations using Python.                                                                     |
| <b>Week 11</b> | Computer Arithmetic                                                                                         |
| <b>Week 12</b> | Computer Arithmetic Cont.                                                                                   |
| <b>Week 13</b> | Software-Hardware Interface                                                                                 |
| <b>Week 14</b> | Python-based simulations of hardware interactions.                                                          |
| <b>Week 15</b> | Review and Final Exam                                                                                       |
| <b>Week 16</b> | Exam                                                                                                        |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|               | Material Covered                                                                                                                                       |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 1</b> | Lab 1: Introduction to Assembly Language: Writing and executing simple assembly programs. Understanding the syntax and structure of assembly language. |
| <b>Week 2</b> | Lab 2: Memory Systems and Addressing: Exploring memory hierarchy through simulations. Practicing memory addressing modes and calculations.             |
| <b>Week 3</b> | Lab 3: CPU Operation and Registers: Simulating CPU operation and instruction execution.                                                                |
|               | Working with CPU registers and flags.                                                                                                                  |

|                |                                                                                                                                                                                           |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 4</b>  | Lab 4: Assembly Language Programming: Writing more complex assembly programs to solve specific tasks.<br>Debugging assembly code using tools and simulators.                              |
| <b>Week 5</b>  | Lab 5: I/O Operations: Simulating input and output operations using Python.<br>Interfacing with devices and device controllers.                                                           |
| <b>Week 6</b>  | Lab 6: Computer Arithmetic: Implementing basic arithmetic operations in assembly language.<br>Simulating fixed-point and floating-point arithmetic.                                       |
| <b>Week 7</b>  | Lab 7: pelining and Parallel Processing: Understanding pipelining concepts through practical examples.<br>Exploring parallel programming using multicore processors.                      |
| <b>Week 8</b>  | Lab 8 Memory Management and Virtual Memory: Simulating memory allocation and deallocation.<br>Exploring virtual memory concepts and page replacement algorithms.                          |
| <b>Week 9</b>  | Lab9: Hardware Simulations: Creating hardware simulations in Python.<br>Simulating CPU behavior, memory systems, and I/O operations.                                                      |
| <b>Week 10</b> | Lab 10: Assembly Language Projects: Undertaking more extensive assembly language projects.<br>Developing practical solutions to real-world problems.                                      |
| <b>Week 11</b> | Lab 11: Benchmarking and Performance Analysis: Measuring and analyzing the performance of different architectures.<br>Comparing the efficiency of assembly code vs. high-level languages. |
| <b>Week 12</b> | Lab 12: Operating System Interaction:                                                                                                                                                     |
| <b>Week 13</b> | Lab 13: Interacting with the operating system through assembly language.                                                                                                                  |
| <b>Week 14</b> | Lab 14: Understanding system calls and their impact on hardware.                                                                                                                          |
| <b>Week 15</b> | Lab15: Final Project                                                                                                                                                                      |
|                |                                                                                                                                                                                           |

### Learning and Teaching Resources

مصادر التعلم والتدريس

|  | Text | Available in the Library? |
|--|------|---------------------------|
|--|------|---------------------------|

|                   |                                                                                            |    |
|-------------------|--------------------------------------------------------------------------------------------|----|
| Required Texts    | Computer Organization and Design" by David A. Patterson and John L. Hennessy".             | No |
| Recommended Texts | Computer Systems: A Programmer's Perspective" by Randal E. Bryant and David R. O'Hallaron" | No |
| Websites          |                                                                                            |    |

| Grading Scheme<br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                       |                  |                     |          |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks %  | Definition                            |
| Success Group<br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                          | A – Excellent    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | B - Very Good    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | C – Good         | جيد                 | 70 - 79  | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | D - Satisfactory | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | E – Sufficient   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                               | FX – Fail        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | F – Fail         | راسب                | (0-44)   | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                  |                     |          |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                  |                     |          |                                       |

## Module 4

### MODULE DESCRIPTION FORM

#### نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية |                                 |                                                                                                                           |
|-----------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Module Title                                  | <b>Data Security Principles</b> | Module Delivery                                                                                                           |
| Module Type                                   | Core                            | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab |
| Module Code                                   | CyS104                          |                                                                                                                           |
| ECTS Credits                                  | 5                               |                                                                                                                           |

|                                    |                     |                                                                                                                        |                                                        |
|------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| SWL (hr/sem)                       | 125                 | <input checked="" type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                        |
| Module Level                       | UC                  | Semester of Delivery                                                                                                   | 1                                                      |
| Administering Department           | CyS                 | College                                                                                                                | College of Computer Science and Information Technology |
| Module Leader                      |                     | e-mail                                                                                                                 |                                                        |
| Module Leader's Acad. Title        | Assist Proff        | Module Leader's Qualification                                                                                          | PHD                                                    |
| Module Tutor                       | Name (if available) | e-mail                                                                                                                 | E-mail                                                 |
| Peer Reviewer Name                 | Name                | e-mail                                                                                                                 | E-mail                                                 |
| Scientific Committee Approval Date | 1/10/2023           | Version Number                                                                                                         | 1.0                                                    |

|                                                                         |      |          |  |
|-------------------------------------------------------------------------|------|----------|--|
| <b>Relation with other Modules</b><br>العلاقة مع المواد الدراسية الأخرى |      |          |  |
| Prerequisite module                                                     | None | Semester |  |
| Co-requisites module                                                    |      | Semester |  |

|                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Module Objectives</b><br>أهداف المادة الدراسية                                                                         | 12. Understand the core principles of data security, including confidentiality, integrity, and availability.<br>13. Recognize common security threats and vulnerabilities in digital environments.<br>14. Apply best practices for protecting personal data, devices, and online activities.<br>15. Identify social engineering tactics and scams and employ strategies to avoid them. |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                             | <p>16. Gain practical skills for securing passwords, email communication, and social media accounts.</p> <p>17. Learn about malware and antivirus tools, and how to protect against them.</p> <p>18. Understand the importance of privacy and compliance with data protection regulations.</p> <p>19. Develop critical thinking skills to assess and respond to data security incidents.</p>                                                                                                                                                                                                                                                              |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>1. Understand core data security principles: confidentiality, integrity, and availability.</li> <li>2. Identify common security threats and vulnerabilities.</li> <li>3. Explain encryption and access control mechanisms.</li> <li>4. Recognize and respond to social engineering tactics.</li> <li>5. Comprehend privacy regulations and compliance requirements.</li> <li>6. Apply practical skills in password management and device security.</li> <li>7. Evaluate real-world security scenarios and propose solutions.</li> <li>8. Develop ethical and security-conscious decision-making skills.</li> </ol> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <p>Indicative content includes the following.</p> <ul style="list-style-type: none"> <li>- Intro to Data Security</li> <li>- Encryption &amp; Access Control</li> <li>- Network Security Privacy &amp; Compliance</li> <li>- Social Engineering &amp; Response</li> <li>- Recognizing social engineering.</li> <li>- Responding to threats.</li> <li>- Secure Practices &amp; Review</li> </ul>                                                                                                                                                                                                                                                           |

## Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                       |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | The course employs various strategies, including lectures, discussions, hands-on activities, group projects, assessments, online resources, and guest speakers, to engage students and develop their understanding of data security principles. These strategies aim to create an interactive and comprehensive learning environment. |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 64  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4.2 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 61  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4   |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 125 |                                                                           |     |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                     |             |                |            |                           |
|---------------------------------------------------|---------------------|-------------|----------------|------------|---------------------------|
|                                                   |                     | Time/Number | Weight (Marks) | Week Due   | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | <b>Quizzes</b>      | 2           | 10% (10)       | 5 and 10   | LO #1, #3, #5, #7         |
|                                                   | <b>Assignments</b>  | 2           | 10% (10)       | 2 and 12   | LO #2, #3, #6             |
|                                                   | <b>Lab</b>          | 1           | 10% (10)       | Continuous | All                       |
|                                                   | <b>Report</b>       | 1           | 10% (10)       | 13         | LO #1, #2, #5, #7         |
|                                                   | <b>Midterm Exam</b> | 2hr         | 10% (10)       | 7          | LO #1 - #7                |

|                             |                   |     |                  |    |     |
|-----------------------------|-------------------|-----|------------------|----|-----|
| <b>Summative assessment</b> | <b>Final Exam</b> | 3hr | 50% (50)         | 16 | All |
| <b>Total assessment</b>     |                   |     | 100% (100 Marks) |    |     |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                                                     |
|-------------------------------------------------------------------|---------------------------------------------------------------------|
|                                                                   | <b>Material Covered</b>                                             |
| <b>Week 1</b>                                                     | Introduction to Data Security : Understanding data security.        |
| <b>Week 2</b>                                                     | The importance of data security. Common security threats.           |
| <b>Week 3</b>                                                     | Protecting Your Data: Passwords and creating strong ones.           |
| <b>Week 4</b>                                                     | Securing your devices. Safe internet usage.                         |
| <b>Week 5</b>                                                     | Email and Social Media Safety: Recognizing phishing emails.         |
| <b>Week 6</b>                                                     | Protecting social media accounts.<br>Safe information sharing.      |
| <b>Week 7</b>                                                     | Online Shopping and Banking: Secure online shopping practices.      |
| <b>Week 8</b>                                                     | Protecting financial information.<br>Safeguarding personal data..   |
| <b>Week 9</b>                                                     | Privacy and Personal Information: Identifying personal information. |
| <b>Week 10</b>                                                    | Privacy settings and online profiles.<br>Risks of oversharing.      |
| <b>Week 11</b>                                                    | Malware and Viruses: Understanding malware.                         |
| <b>Week 12</b>                                                    | Recognizing and avoiding malware.                                   |

|                |                                                                         |
|----------------|-------------------------------------------------------------------------|
|                | Introduction to antivirus software.                                     |
| <b>Week 13</b> | Social Engineering and Scams: What is social engineering?               |
| <b>Week 14</b> | Common scams and how to avoid them.<br>Reporting suspicious activities. |
| <b>Week 15</b> | Review and Final Assessment                                             |
| <b>Week 16</b> | <b>Exam</b>                                                             |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                                                                                                                                                                                            |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                         | <b>Material Covered</b>                                                                                                                                                                                    |
| <b>Week 1</b>                                                           | Lab 1: Orientation and Introduction to Encryption: Lab orientation, safety guidelines, and expectations.<br>Introduction to encryption concepts.<br>Lab tool: VeraCrypt - Setting up encrypted containers. |
| <b>Week 2</b>                                                           | Lab 2: Encryption Practices: Practical encryption exercises using VeraCrypt.<br>Secure file storage and retrieval.                                                                                         |
| <b>Week 3</b>                                                           | Lab 3: Access Control Configuration: Introduction to access control.<br>Lab tool: Windows Security Policies - Configuring access control lists (ACLs).                                                     |
| <b>Week 4</b>                                                           | Lab 4: User Authentication:<br>Implementing user authentication and access policies.<br>Testing and validating access control measures.                                                                    |
| <b>Week 5</b>                                                           | Lab 5 Threat Recognition and Response:<br>Understanding network traffic analysis.                                                                                                                          |

|                |                                                                                                                                                                                                       |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Lab tool: Wireshark - Analyzing network traffic for security threats.                                                                                                                                 |
| <b>Week 6</b>  | <p>Lab 6: Simulated Incident Response:</p> <p>Hands-on exercises in simulated incident response.</p> <p>Developing incident response plans. Simulating fixed-point and floating-point arithmetic.</p> |
| <b>Week 7</b>  | <p>Lab 7: Security Tool Utilization (Part 1):</p> <p>Lab tool: Wireshark - Advanced network traffic analysis.</p> <p>Identifying security incidents.</p>                                              |
| <b>Week 8</b>  | <p>Lab 8: Security Tool Utilization (Part 2):</p> <p>Lab tool: Snort - Configuring and using intrusion detection.</p> <p>Responding to detected intrusions.</p>                                       |
| <b>Week 9</b>  | <p>Lab9: Risk Assessment and Mitigation (Part 1):</p> <p>Introduction to vulnerability assessments.</p> <p>Lab tool: Nessus - Scanning for vulnerabilities.</p>                                       |
| <b>Week 10</b> | <p>Lab 10: Risk Assessment and Mitigation (Part 2):</p> <p>Analyzing vulnerability scan results.</p> <p>Proposing security measures based on findings.</p>                                            |
| <b>Week 11</b> | <p>Lab 11: Secure Communication:</p> <p>Introduction to secure communication.</p> <p>Lab tool: GnuPG (GPG) - Configuring email encryption using GPG.</p>                                              |
| <b>Week 12</b> | <p>Lab 12: Secure File Transfer:</p> <p>Secure file transfer using GPG.</p> <p>Ensuring confidentiality and integrity.</p>                                                                            |

|                |                                                                                                                                        |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 13</b> | <p>Lab 13: Final Project (Part 1):</p> <p>Introduction to the final project.</p> <p>Project selection and planning.</p>                |
| <b>Week 14</b> | <p>Lab 14: Final Project (Part 2):</p> <p>Project work and implementation.</p> <p>Troubleshooting and finalizing project outcomes.</p> |
| <b>Week 15</b> | Lab15: Project Presentations and Course Conclusion                                                                                     |
|                |                                                                                                                                        |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                                      | Available in the Library? |
|--------------------------|-------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | <b>Principles of Information Security" by Michael E. Whitman and Herbert J. Mattord</b>   | No                        |
| <b>Recommended Texts</b> | <b>"Computer Security: Principles and Practice" by William Stallings and Lawrie Brown</b> | No                        |
| <b>Websites</b>          | <a href="https://owasp.org">https://owasp.org</a>                                         |                           |

## Grading Scheme

مخطط الدرجات

| Group                               | Grade                | التقدير | Marks %  | Definition                     |
|-------------------------------------|----------------------|---------|----------|--------------------------------|
| <b>Success Group<br/>(50 - 100)</b> | <b>A – Excellent</b> | امتياز  | 90 - 100 | Outstanding Performance        |
|                                     | <b>B - Very Good</b> | جيد جدا | 80 - 89  | Above average with some errors |
|                                     | <b>C – Good</b>      | جيد     | 70 - 79  | Sound work with notable errors |

|            |                  |                     |         |                                       |
|------------|------------------|---------------------|---------|---------------------------------------|
|            | D – Satisfactory | متوسط               | 60 - 69 | Fair but with major shortcomings      |
|            | E – Sufficient   | مقبول               | 50 - 59 | Work meets minimum criteria           |
| Fail Group | FX – Fail        | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| (0 – 49)   | F – Fail         | راسب                | (0-44)  | Considerable amount of work required  |
|            |                  |                     |         |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 5

### MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| Module Information          |                     |                               |                                                                                            |  |
|-----------------------------|---------------------|-------------------------------|--------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية     |                     |                               |                                                                                            |  |
| Module Title                | Calculus            |                               | Module Delivery                                                                            |  |
| Module Type                 | Core                |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lectures |  |
| Module Code                 | CyB 106             |                               |                                                                                            |  |
| ECTS Credits                | 5                   |                               |                                                                                            |  |
| SWL (hr/sem)                | 100                 |                               |                                                                                            |  |
| Module Level                | 1                   | Semester of Delivery          | 1                                                                                          |  |
| Administering Department    | Type Dept. Code     | College                       | Type College Code                                                                          |  |
| Module Leader               |                     | e-mail                        |                                                                                            |  |
| Module Leader's Acad. Title | Lecturer            | Module Leader's Qualification | Ph.D.                                                                                      |  |
| Module Tutor                | Name (if available) | e-mail                        | E-mail                                                                                     |  |
| Peer Reviewer Name          | Name                | e-mail                        | E-mail                                                                                     |  |

|                                    |  |                |     |
|------------------------------------|--|----------------|-----|
| Scientific Committee Approval Date |  | Version Number | 1.0 |
|------------------------------------|--|----------------|-----|

| Relation with other Modules       |          |          |  |
|-----------------------------------|----------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |          |          |  |
| Prerequisite module               | Calculus | Semester |  |
| Co-requisites module              | None     | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Module Objectives</b><br>أهداف المادة الدراسية        | <p>-Cognitive Goals</p> <ol style="list-style-type: none"> <li>1. Upon Successful completion of this subject, students should :</li> <li>2. Be able to use algebra accurately;</li> <li>3. Be able to plot and interpret graphs</li> <li>4. Be able to use exponential, logarithm, and trigonometric functions in applications;</li> <li>5. Be able to calculate the sums of arithmetic and geometric series and use them in simple financial calculations;</li> <li>6. Be able to use basic rules of differentiation and calculate derivatives of simple functions;</li> <li>7. Be able to use matrix in solving linear system of equations;</li> </ol> <p>-Skill goals</p> <ol style="list-style-type: none"> <li>1. Enable the student to refer the mathematical problem to a program and find a solution through the computer.</li> <li>2. Student realization of the close relationship between mathematical problems and computer programs</li> </ol> |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | <p>Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.</p> <ol style="list-style-type: none"> <li>1. This subject is designed for students who enter university without a strong background in mathematics</li> <li>2. It is also for students who are planning to enroll in subjects requiring basic numeracy skills such as sciences, computing and information technology.</li> <li>3. The subject reinforces calculation skills, basic algebra .</li> <li>4. This subject is designed to work with formula.</li> <li>5. It is also to use applications of exponential and logarithmic functions.</li> <li>6. It is designed how applying matrix to solve linear system of equations.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | <p>Indicative content includes the following.</p> <p>Part A – Sequences and series</p> <p><u>Sequence</u> is a function whose domain is the set of natural numbers. The terms of the sequence are the function values. There will be studied two types of sequences: arithmetic and geometric sequences with their partial sums. While series means that the infinite sum of geometric sequence. [12 hrs]</p> <p>Part B – Matrices</p> <p>Matrices are simply a rectangular array of numbers with <b>m</b> rows and <b>n</b> columns . There will be studied some: types of matrices, algebra of matrices. It is also studied how to find inverse of matrix, how to use matrix and its inverse to solve linear system of equations, how to find determinant of matrix and use it to solve linear system of equations. [12 hrs]</p> <p>Part C – Derivatives and integrals</p> <p>Derivatives mean that if <math>f: x \rightarrow y</math> is a function, the derivative of a function <math>f</math> at a point <math>x_0</math> written <math>f'(x_0)</math>; is given by</p> $f'(x_0) = \lim_{x \rightarrow x_0} \frac{f(x) - f(x_0)}{x - x_0},$ <p>If this limit exists and finite. There will be studied the derivatives of usual functions, implicit derivatives, derivatives of trigonometric</p> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>functions, derivatives of exponential and logarithm functions. Graphical of exponential and logarithm functions. While integrals means that if <math>f(x)</math> function defined at some interval, let <math>F(x)</math> be another function such that <math>F'(x) = f(x)</math>, <math>F(x)</math> called an infinite integral of <math>f(x)</math> and is written as the following form <math>\int f(x)dx = F(x) + C</math>. [12 hrs].</p> <p>Part D – Interest</p> <p>Interest is the rental fee charged by a lender to a business or an individual for the use of money . There will be studied simple and compound interests. Simple interest means that the interest is calculated <i>only once</i> for the entire time period of the loan. At the end of the time period, the borrower repays the principal plus the Interest . while compound interest means that means that the interest is calculated more than once during the time period of the loan. [9 hrs].</p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <ol style="list-style-type: none"> <li>1.Explain the topic in detail by the teacher by writing the topic and explaining it on the board and other teaching aids</li> <li>2. Discussion during the lecture period</li> <li>3. Doing homework</li> <li>4. See the websites of the subject</li> </ol> |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا |    |                                                                     |     |
|--------------------------------------------------------------------------|----|---------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل | 64 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا | 4.2 |
| <b>Unstructured SWL (h/sem)</b>                                          | 61 | <b>Unstructured SWL (h/w)</b>                                       | 4   |

|                                                                   |            |                                          |  |
|-------------------------------------------------------------------|------------|------------------------------------------|--|
| الحمل الدراسي غير المنتظم للطلاب خلال الفصل                       |            | الحمل الدراسي غير المنتظم للطلاب أسبوعيا |  |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل | <b>125</b> |                                          |  |

| Module Evaluation     |                 |             |                  |            |                           |
|-----------------------|-----------------|-------------|------------------|------------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |            |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 10% (10)         | 5 and 10   | LO #1, #2 and #10, #11    |
|                       | Assignments     | 2           | 10% (10)         | 2 and 12   | LO #3, #4 and #6, #7      |
|                       | Projects / Lab. | 1           | 10% (10)         | Continuous | All                       |
|                       | Report          | 1           | 10% (10)         | 13         | LO #5, #8 and #10         |
| Summative assessment  | Midterm Exam    | 2hr         | 10% (10)         | 7          | LO #1 - #7                |
|                       | Final Exam      | 3hr         | 50% (50)         | 16         | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |            |                           |

| Delivery Plan (Weekly Syllabus) |                                             |
|---------------------------------|---------------------------------------------|
| المنهاج الاسبوعي النظري         |                                             |
|                                 | Material Covered                            |
| Week 1                          | Introduction – Sequences                    |
| Week 2                          | Arithmetic sequences and their partial sums |
| Week 3                          | Geometric sequences and their partial sums  |
| Week 4                          | Series                                      |

|                |                                                                 |
|----------------|-----------------------------------------------------------------|
| <b>Week 5</b>  | Matrices and algebra of matrices                                |
| <b>Week 6</b>  | Inverse of matrices                                             |
| <b>Week 7</b>  | Solving linear system of equations by using inverse of matrices |
| <b>Week 8</b>  | Determinant and using it to solve linear system of equations    |
| <b>Week 9</b>  | Derivatives                                                     |
| <b>Week 10</b> | Derivatives of trigonometric, exponential, logarithm functions  |
| <b>Week 11</b> | Integrals                                                       |
| <b>Week 12</b> | Integral of trigonometric, exponential, logarithm functions     |
| <b>Week 13</b> | Interest and simple interest                                    |
| <b>Week 14</b> | Compound interest                                               |
| <b>Week 15</b> | Present and future values of an annuity                         |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>                   |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                                   | Available in the Library? |
|--------------------------|----------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | Cheryl Cleaves, Margie Hobbs and Jeffry Noble                                          | Yes                       |
| <b>Recommended Texts</b> | James Stewart , Lothar Redlin and Saleem Watson<br>Robert Brechner and George Bergeman | Yes                       |
| <b>Websites</b>          |                                                                                        |                           |

## Grading Scheme

مخطط الدرجات

| Group                              | Grade                   | التقدير             | Marks %  | Definition                            |
|------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| <b>Success Group</b><br>(50 - 100) | <b>A – Excellent</b>    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                    | <b>B - Very Good</b>    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                                    | <b>C – Good</b>         | جيد                 | 70 - 79  | Sound work with notable errors        |
|                                    | <b>D – Satisfactory</b> | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                                    | <b>E – Sufficient</b>   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)      | <b>FX – Fail</b>        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                    | <b>F – Fail</b>         | راسب                | (0-44)   | Considerable amount of work required  |
|                                    |                         |                     |          |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 6

### MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| Module Information      |           |                                            |
|-------------------------|-----------|--------------------------------------------|
| معلومات المادة الدراسية |           |                                            |
| Module Title            | English I | Module Delivery                            |
| Module Type             | Support   | <input checked="" type="checkbox"/> Theory |
| Module Code             | UOB102    | <input type="checkbox"/> Lecture           |
| ECTS Credits            | 2         | <input type="checkbox"/> Lab               |
| SWL (hr/sem)            | 50        | <input type="checkbox"/> Tutorial          |
|                         |           | <input type="checkbox"/> Practical         |

|                                    |           |                               |                                  |
|------------------------------------|-----------|-------------------------------|----------------------------------|
|                                    |           |                               | <input type="checkbox"/> Seminar |
| Module Level                       | 1         | Semester of Delivery          | 2                                |
| Administering Department           | CyB       | College                       | CSIT                             |
| Module Leader                      |           | e-mail                        |                                  |
| Module Leader's Acad. Title        | Professor | Module Leader's Qualification | Ph.D.                            |
| Module Tutor                       |           | e-mail                        |                                  |
| Peer Reviewer Name                 |           | e-mail                        |                                  |
| Scientific Committee Approval Date | / /2023   | Version Number                | 1.0                              |

### Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

|                      |        |          |  |
|----------------------|--------|----------|--|
| Prerequisite module  | CyB105 | Semester |  |
| Co-requisites module | None   | Semester |  |

### Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b><br>أهداف المادة الدراسية                | 1. Developing communication approaches.<br>2. Enhancing total physical response (TPR).<br>3. Establishing multi-outcome learning (English and science knowledge for instance).                                                                                                                                                                                                                                                   |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | 1. <b>Improved Communication Skills:</b> Students should be able to communicate more effectively in English, expressing themselves with greater fluency and accuracy. They can participate in everyday conversations, express opinions, and discuss various topics.<br>2. <b>Expanded Vocabulary:</b> Learners should have developed a broader range of vocabulary, allowing them to understand and use a wider variety of words |

|                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                              | <p>and expressions.</p> <ol style="list-style-type: none"> <li>3. <b>Grammar Proficiency:</b> Students are expected to have a better grasp of English grammar, allowing them to construct more complex sentences and convey different tenses and aspects more accurately.</li> <li>4. <b>Reading Comprehension:</b> Learners should be able to read and comprehend a variety of texts, such as articles, short stories, and excerpts from novels, with a reasonable level of understanding.</li> <li>5. <b>Writing Skills:</b> Students should be able to write coherent paragraphs and short texts, such as emails, letters, and simple essays, demonstrating improved sentence structure and organization.</li> <li>6. <b>Listening Skills:</b> Learners should have developed better listening skills, allowing them to understand and follow conversations, interviews, and media in English with less difficulty.</li> <li>7. <b>Cultural Awareness:</b> At this level, students may have been exposed to various cultural aspects of English-speaking countries, leading to a better understanding of cultural norms and customs.</li> <li>8. <b>Independent Learning:</b> Students should be more confident and independent in their language learning journey, taking initiatives to practice and learn outside of the classroom.</li> <li>9. <b>Preparation for Advanced Levels:</b> English Level II usually serves as a foundation for more advanced language courses. After completing this level, students should be ready to progress to higher-level language studies.</li> </ol> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p> | <p>International student:</p> <p>READING: Going abroad to study.</p> <ul style="list-style-type: none"> <li>• Following instructions: filling in forms</li> <li>• Reading methods: skim; scan; intensive reading; extensive reading</li> </ul> <p>WRITING: A host family</p> <ul style="list-style-type: none"> <li>• Checking your writing: error correction - punctuation and spelling</li> <li>• Writing an informal email</li> </ul> <p>Where in the world:</p> <p>READING: Three countries</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Skimming and scanning: reading for the general idea, and for particular information</li> </ul> <p>WRITING: My country</p> <ul style="list-style-type: none"> <li>• Brain storming ideas: topic areas and examples;</li> <li>• completing a paragraph</li> <li>• Linking ideas (1): but, however, although</li> <li>• Writing a description of my country</li> </ul> <p>Newspaper articles:</p> <p>READING: An unexpected journey</p> <ul style="list-style-type: none"> <li>• Predicting content: using the title and the pictures</li> <li>• Meaning from context: guessing the meaning of new words</li> </ul> <p>WRITING My country</p> <ul style="list-style-type: none"> <li>• Brainstorming ideas: topic areas and examples; completing a paragraph</li> <li>• Linking ideas (1): but, however, although Writing a description of my country</li> </ul> <p>Modern technology:</p> <p>READING Innovation</p> <ul style="list-style-type: none"> <li>• Purpose and audience (1 and 2): using visual and written clues</li> </ul> <p>WRITING Mistaken identity</p> <ul style="list-style-type: none"> <li>• Sentences/Paragraphs; helping your writing flow</li> <li>• Varying the structure: making writing interesting Writing an article</li> </ul> <p>Conferences and visits</p> <p>READING: A conference in Istanbul</p> <ul style="list-style-type: none"> <li>• Purpose and audience (1 and 2): using visual and written clues</li> </ul> <p>WRITING Invitations</p> <ul style="list-style-type: none"> <li>• Using formal expressions: writing academic emails and letters</li> <li>• Writing a formal email</li> </ul> <p>Science and our world:</p> <p>READING: Air pollution</p> |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- Making notes: organizing recording, and remembering important information
- Interpreting meaning; recognizing fact and speculation

WRITING Technology - good or bad?

- Organizing ideas (1): planning the arguments for and against
- Linking ideas (2): first, for instance, in conclusion ... Writing a discursive essay

People: past and present

READING: Three famous writers

- Using original sources: dealing with difficult language and unknown vocabulary

WRITING: Trends

- Paraphrasing and summarizing: using other sources
- Writing a summary

The world of IT:

READING: Computers

- Rephrasing and explaining; dealing with difficult scientific and technological words
- Avoiding repetition (2): pronouns and what they refer to

WRITING: IT - benefits and drawbacks

- Linking ideas (3): cause and result Coherent writing; writing up notes
- Writing from notes

Inventions, discoveries, and processes:

READING: How things work

- Intensive reading: strategies for focusing your reading
- Linking ideas (4); sequencing words to describe a process

WRITING How things are made

- The passive voice; writing in neutral style
- Clarifying a sequence: describing a process

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Writing a description of a process</li> </ul> <p>Travel and tourism:</p> <p>READING: International tourism</p> <ul style="list-style-type: none"> <li>• Interpreting data: statistical information in graphs, charts, and texts</li> </ul> <p>VOCABULARY DEVELOPMENT Varying vocabulary (2)</p> <ul style="list-style-type: none"> <li>• A voiding repetition (3): describing graphs using synonyms, adjectives + nouns, verbs + adverbs</li> </ul> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>For Teachers:</p> <ol style="list-style-type: none"> <li>1. <b>Interactive and Communicative Approach:</b> Encourage students to engage in meaningful conversations, discussions, and role-plays. This approach emphasizes real-life communication and helps students practice using English in different contexts.</li> <li>2. <b>Error Correction:</b> Provide constructive feedback on students' errors without discouraging them. Focus on correcting essential mistakes that hinder communication while praising their efforts to build confidence.</li> <li>3. <b>Contextual Learning:</b> Use authentic materials like articles, videos, and short stories to introduce new vocabulary and grammar in relevant contexts. This helps students understand language usage in real-life situations.</li> <li>4. <b>Task-Based Learning:</b> Design activities and tasks that require students to use English to complete meaningful projects or solve problems. This approach fosters critical thinking and language application skills.</li> <li>5. <b>Grammar in Context:</b> Teach grammar points within the context of authentic texts or dialogues. This helps students see how grammar functions in real communication rather than just learning rules in isolation.</li> </ol> |

6. **Encourage Reading:** Assign reading materials suited to the students' proficiency level. Reading improves vocabulary, comprehension, and exposes students to different writing styles.
7. **Listening Practice:** Provide opportunities for listening exercises, such as watching English-language videos, movies, or podcasts. This enhances listening skills and exposes students to different accents and speech patterns.
8. **Writing Practice:** Assign writing tasks like essays, emails, or short stories. Provide feedback on their writing to improve their skills gradually.

For Students:

1. **Consistent Practice:** Regularly practice reading, writing, listening, and speaking in English. Consistency is crucial for improvement.
2. **Use Language Apps and Online Resources:** Utilize language learning apps and online resources to reinforce learning, expand vocabulary, and improve grammar.
3. **Join Language Exchange Groups:** Engage in language exchange programs or groups where you can practice speaking English with native speakers or other learners.
4. **Set Goals:** Establish clear language learning goals and track your progress. Celebrate achievements and milestones.
5. **Immerse Yourself:** Surround yourself with English as much as possible. Watch English movies, TV shows, and listen to English music or podcasts.
6. **Keep a Language Journal:** Write down new words, expressions, and grammar rules you learn. Review and practice them regularly.
7. **Practice with Different Media:** Practice English through various mediums like reading books, watching documentaries, listening to news, or participating in online forums.
8. **Be Patient and Persistent:** Language learning takes time and effort. Stay motivated and persistent even if you encounter challenges.

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعاً

|                                                                                |    |                                                                           |     |
|--------------------------------------------------------------------------------|----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 33 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 2   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 42 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 2.8 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 75 |                                                                           |     |

| <b>Module Evaluation</b>    |                     |             |                  |          |                           |
|-----------------------------|---------------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية       |                     |             |                  |          |                           |
|                             |                     | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| <b>Formative assessment</b> | <b>Quizzes</b>      | 2           | 10% (10)         | 5 and 10 | LO #1, #2 and #10,        |
|                             | <b>Assignments</b>  | 2           | 10% (10)         | 2 and 12 | LO #3, #4 and #6, #7      |
|                             | <b>Report</b>       | 1           | 20% (10)         | 13       | LO #5, #8 and #10         |
| <b>Summative assessment</b> | <b>Midterm Exam</b> | 2hr         | 10% (10)         | 7        | LO #1 - #7                |
|                             | <b>Final Exam</b>   | 3hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>     |                     |             | 100% (100 Marks) |          |                           |

| <b>Delivery Plan (Weekly Syllabus)</b> |                       |
|----------------------------------------|-----------------------|
| المناهج الاسبوعي النظري                |                       |
|                                        | Material Covered      |
| <b>Week 1</b>                          | International student |

|                |                                        |
|----------------|----------------------------------------|
| <b>Week 2</b>  | Where in the world                     |
| <b>Week 3</b>  | Newspaper articles                     |
| <b>Week 4</b>  | Conferences and visits                 |
| <b>Week 5</b>  | Science and our world                  |
| <b>Week 6</b>  | Midterm exam                           |
| <b>Week 7</b>  | People: past and present               |
| <b>Week 8</b>  | The world of IT                        |
| <b>Week 9</b>  | Inventions, discoveries, and processes |
| <b>Week 10</b> | Travel and tourism                     |
| <b>Week 11</b> | Final exam                             |

| Learning and Teaching Resources |                                                                                                              |                           |
|---------------------------------|--------------------------------------------------------------------------------------------------------------|---------------------------|
| مصادر التعلم والتدريس           |                                                                                                              |                           |
|                                 | Text                                                                                                         | Available in the Library? |
| <b>Required Texts</b>           | Sarah Philpot. Headway: Academic skills- reading, writing, and study skills. LEVEL 2 Student's Book. Oxford. | Yes                       |
| <b>Recommended Texts</b>        |                                                                                                              |                           |
| <b>Websites</b>                 |                                                                                                              |                           |

| Grading Scheme |       |         |         |            |
|----------------|-------|---------|---------|------------|
| مخطط الدرجات   |       |         |         |            |
| Group          | Grade | التقدير | Marks % | Definition |

|                                                                                                                                                                                                                                                                                                                                                                                             |                         |                     |          |                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| <b>Success Group</b><br><b>(50 - 100)</b>                                                                                                                                                                                                                                                                                                                                                   | <b>A - Excellent</b>    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>B - Very Good</b>    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>C - Good</b>         | جيد                 | 70 - 79  | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>D - Satisfactory</b> | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>E - Sufficient</b>   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br><b>(0 – 49)</b>                                                                                                                                                                                                                                                                                                                                                        | <b>FX – Fail</b>        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>F – Fail</b>         | راسب                | (0-44)   | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                         |                     |          |                                       |
| <p><b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.</p> |                         |                     |          |                                       |

## Curriculum for the first Year, Second Semester.

### Module 1

#### MODULE DESCRIPTION FORM

#### نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية |                        |                                                                                                                           |
|-----------------------------------------------|------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Module Title                                  | Computer ProgrammingII | Module Delivery                                                                                                           |
| Module Type                                   | Core                   | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab |
| Module Code                                   | CyS107                 |                                                                                                                           |

|                                    |                     |                                                                                                                        |                                                        |
|------------------------------------|---------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| ECTS Credits                       | 7                   | <input checked="" type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                        |
| SWL (hr/sem)                       | 175                 |                                                                                                                        |                                                        |
| Module Level                       | 1                   | Semester of Delivery                                                                                                   | 2                                                      |
| Administering Department           | CyS                 | College                                                                                                                | College of Computer Science and Information Technology |
| Module Leader                      |                     | e-mail                                                                                                                 |                                                        |
| Module Leader's Acad. Title        |                     | Module Leader's Qualification                                                                                          |                                                        |
| Module Tutor                       | Name (if available) | e-mail                                                                                                                 | E-mail                                                 |
| Peer Reviewer Name                 | Name                | e-mail                                                                                                                 | E-mail                                                 |
| Scientific Committee Approval Date | 1/10/2023           | Version Number                                                                                                         | 1.0                                                    |

### Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

|                      |                               |          |           |
|----------------------|-------------------------------|----------|-----------|
| Prerequisite module  | CyS101 Computer Programming I | Semester | 1/Level 1 |
| Co-requisites module | None                          | Semester |           |

### Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                   |                                                                                                                                                                                                                                                                            |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b><br>أهداف المادة الدراسية | 1. Learn of programming languages provides added insight into other fields.<br>2. Understanding the practical and responsible use and management of program language is important for managers and other business knowledge workers in today's global information Society. |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                             | <p>3. ensure the student understood the components of programming language and how all of these components work together to bring value to an organization.</p> <p>4. turn students attention to the role that programming language plays in global information Society.</p> <p>6. in this course we will cover basic concepts and techniques for programming including arrays and strings.</p> <p>7. Why learn about loop types?</p> <ul style="list-style-type: none"> <li>- For..loop.</li> <li>- While..loop.</li> <li>- Do while loop.</li> <li>- Nested loop.</li> </ul> <p>8. Why learn about series?</p> <p>9. Why learn about Shape?</p> <p>10. Why learn about strings?</p> <p>11. Why Learn about functions?</p> <ul style="list-style-type: none"> <li>- Defining a Function, Function Declarations, Calling a Function, Function Arguments(Call by value, Call by Reference)</li> </ul> <p>12. Why learn about Array?</p> <ul style="list-style-type: none"> <li>- One and Two-dimensional array.</li> </ul>                                                                         |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>1. Give the student the most important skills to become a Python power users have a broad understanding of Python language and they know which tool or function is best used in a given situation.</li> <li>2. At the end of this course, students should be able to design, write and test a Python program to implement a working solution to a given problem.</li> <li>3. Learn the most important skills to deal with loop types, functions, strings.</li> <li>4. Students should be able to solve more complex and multifaceted problems using programming. This includes the ability to analyze problems, break them down into smaller components, and design and implement solutions.</li> <li>5. Students should have a solid understanding of data structures (e.g., arrays, linked lists, trees, graphs) and algorithms (e.g., sorting, searching, recursion) and be able to apply them to solve a variety of programming challenges.</li> <li>6. The students should be able to write clean, maintainable, and well-documented code.</li> </ol> |

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Indicative Contents</b><br>المحتويات الإرشادية | <p>Indicative content includes the following:</p> <ul style="list-style-type: none"> <li>- <u>Principles of electronic</u><br/>How can use a Python program, entering of variable types, basic input/output the statement, and type of operators.</li> <li>- <u>Shapes</u><br/>If statement, nested if statement, For loop, nested for loop, while, and do while.</li> <li>- <u>Series</u><br/>If statement, nested if statement, For loop, nested for loop, while, and do while.</li> <li>- <u>Function</u><br/>Defining a Function, Calling a Function, Function Arguments(Call by value, Call by Reference)</li> <li>- <u>Strings</u> <ul style="list-style-type: none"> <li>• Declaration, String function, Array of string</li> </ul> </li> <li>- <u>Arrays</u> <ul style="list-style-type: none"> <li>• One-dimensional array</li> <li>• Two-dimensional array</li> </ul> </li> </ul> |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <ul style="list-style-type: none"> <li>• The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills.</li> <li>• Assess your students' prerequisite knowledge to ensure they have a solid understanding of programming fundamentals, which they should have acquired in a previous course.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Provide in-depth lectures on advanced programming topics. Encourage interactive discussions to explore the complexities of the subject matter. Use examples and code snippets to illustrate key concepts.</li> <li>• Incorporate coding exercises and projects that challenge students to apply advanced programming concepts, data structures, and algorithms.</li> <li>• Emphasize good software development practices, including code documentation, version control systems (e.g., Git), unit testing, and debugging techniques.</li> <li>• Assign both individual and group programming projects that require students to design and implement complex software applications. These projects should reflect real-world scenarios.</li> </ul> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 79  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 5.2 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 96  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6.4 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 175 |                                                                           |     |

| Module Evaluation     |             |                |          |                           |
|-----------------------|-------------|----------------|----------|---------------------------|
| تقييم المادة الدراسية |             |                |          |                           |
|                       | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|                       |             |                |          |                           |

|                             |                        |     |                  |            |                  |
|-----------------------------|------------------------|-----|------------------|------------|------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>         | 2   | 10% (10)         | 5 and 10   | LO #1, #2 and #3 |
|                             | <b>Assignments</b>     | 2   | 10% (10)         | 2 and 12   | LO #3, #4 and #6 |
|                             | <b>Projects / Lab.</b> | 1   | 10% (10)         | Continuous | All              |
|                             | <b>Report</b>          | 1   | 10% (10)         | 13         | LO #5, #6        |
| <b>Summative assessment</b> | <b>Midterm Exam</b>    | 2hr | 10% (10)         | 7          | LO #1 - #6       |
|                             | <b>Final Exam</b>      | 3hr | 50% (50)         | 16         | All              |
| <b>Total assessment</b>     |                        |     | 100% (100 Marks) |            |                  |

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

|                | <b>Material Covered</b>                 |
|----------------|-----------------------------------------|
| <b>Week 1</b>  | Introduction to Computer Programming II |
| <b>Week 2</b>  | Loop type (break with continue)         |
| <b>Week 3</b>  | Series in Python                        |
| <b>Week 4</b>  | Use Function with Series in Python      |
| <b>Week 5</b>  | Shape in Python                         |
| <b>Week 6</b>  | Function with Shape in Python           |
| <b>Week 7</b>  | String in Python                        |
| <b>Week 8</b>  | String function                         |
| <b>Week 9</b>  | One dimension array                     |
| <b>Week 10</b> | One dimension array with search         |

|                |                                                |
|----------------|------------------------------------------------|
| <b>Week 11</b> | One dimension array with Sort                  |
| <b>Week 12</b> | One dimension array with Function              |
| <b>Week 13</b> | Two-dimension array                            |
| <b>Week 14</b> | Two-dimension array with Array sort and search |
| <b>Week 15</b> | Two-dimension array with Function              |
| <b>Week 16</b> | <b>Exam</b>                                    |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                                                    |
|-------------------------------------------------------------------------|--------------------------------------------------------------------|
|                                                                         | <b>Material Covered</b>                                            |
| <b>Week 1</b>                                                           | Lab 1: execute many examples of Loop type                          |
| <b>Week 2</b>                                                           | Lab 2: execute many examples of Loop type (break with continue)    |
| <b>Week 3</b>                                                           | Lab 3: execute many examples of Use Series in Python               |
| <b>Week 4</b>                                                           | Lab 4: execute many examples of Use Series in Python               |
| <b>Week 5</b>                                                           | Lab 5: execute many examples of Use Function with Series in Python |
| <b>Week 6</b>                                                           | Lab 7: execute many examples of Shape in Python                    |
| <b>Week 7</b>                                                           | Lab 8 execute many examples of Function with Shape in Python       |
| <b>Week 8</b>                                                           | Lab 6: execute many examples of String                             |
| <b>Week 9</b>                                                           | Lab9: execute many examples of One dimension array                 |
| <b>Week 10</b>                                                          | Lab 10: execute many examples of One dimension array with a search |
| <b>Week 11</b>                                                          | Lab 11: execute many examples of One dimension array with a sort   |
| <b>Week 12</b>                                                          | Lab 12: execute many examples of One dimension array with Function |

|                |                                                                             |
|----------------|-----------------------------------------------------------------------------|
| <b>Week 13</b> | Lab 13:execute many examples of two dimension                               |
| <b>Week 14</b> | Lab 14: execute many examples of Two dimension array with a sort and search |
| <b>Week 15</b> | Lab15: execute many examples of Two dimension array with Function           |
|                |                                                                             |

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

|                          | Text                                                                                                                                                                                              | Available in the Library? |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | <b>Python Programming</b> by Adam Steward - 2022                                                                                                                                                  | No                        |
| <b>Recommended Texts</b> | Python Programming : An Introduction to Computer Science<br>: Second Edition 2009                                                                                                                 | No                        |
| <b>Websites</b>          | <a href="https://mrcet.com/downloads/digital_notes/CSE/III%20Year/PYTHON%20PROGRAMMING%20NOTES.pdf">https://mrcet.com/downloads/digital_notes/CSE/III%20Year/PYTHON%20PROGRAMMING%20NOTES.pdf</a> |                           |

### Grading Scheme

#### مخطط الدرجات

| Group                              | Grade                   | التقدير             | Marks %  | Definition                            |
|------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| <b>Success Group</b><br>(50 - 100) | <b>A – Excellent</b>    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                    | <b>B - Very Good</b>    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                                    | <b>C – Good</b>         | جيد                 | 70 - 79  | Sound work with notable errors        |
|                                    | <b>D - Satisfactory</b> | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                                    | <b>E – Sufficient</b>   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)      | <b>FX – Fail</b>        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                    | <b>F – Fail</b>         | راسب                | (0-44)   | Considerable amount of work required  |
|                                    |                         |                     |          |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 2

### MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| Module Information                 |                     |                               |                                                                                                                                                                                                                                                     |  |
|------------------------------------|---------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية            |                     |                               |                                                                                                                                                                                                                                                     |  |
| Module Title                       | Logic Design        |                               | Module Delivery                                                                                                                                                                                                                                     |  |
| Module Type                        | Core                |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Code                        | CyB 108             |                               |                                                                                                                                                                                                                                                     |  |
| ECTS Credits                       | 4                   |                               |                                                                                                                                                                                                                                                     |  |
| SWL (hr/sem)                       | 105                 |                               |                                                                                                                                                                                                                                                     |  |
| Module Level                       | U                   | Semester of Delivery          |                                                                                                                                                                                                                                                     |  |
| Administering Department           | CyB                 | College                       | CSIT                                                                                                                                                                                                                                                |  |
| Module Leader                      |                     | e-mail                        |                                                                                                                                                                                                                                                     |  |
| Module Leader's Acad. Title        |                     | Module Leader's Qualification |                                                                                                                                                                                                                                                     |  |
| Module Tutor                       | Name (if available) | e-mail                        | E-mail                                                                                                                                                                                                                                              |  |
| Peer Reviewer Name                 | Name                | e-mail                        | E-mail                                                                                                                                                                                                                                              |  |
| Scientific Committee Approval Date | / /2023             | Version Number                | 1.0                                                                                                                                                                                                                                                 |  |

### Relation with other Modules

| العلاقة مع المواد الدراسية الأخرى |      |          |  |
|-----------------------------------|------|----------|--|
| Prerequisite module               |      | Semester |  |
| Co-requisites module              | None | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Module Objectives</b><br>أهداف المادة الدراسية                | <p>This course contributes primarily to the students' knowledge for working professionally in these areas of logic design. Students should be able to apply knowledge of science and engineering, as well as the techniques, skills, and modern engineering tools to analyze, design and optimize logic circuits. In addition, this course provides a modern introduction to logical design and the basic building blocks used in digital systems, in particular digital computers. The students will be introduced to introductory logic design, their principle of operation, analysis, and design. In sum, they will learn how to use this knowledge more easily tailor the degree of technology coverage, accommodating both electrical and computer engineering and computer science audiences.</p>                                                                                                                                                                                                                                                                                                                                |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <p>At the completion of the course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Using number systems and it applies to the material of logic systems.</li> <li>2. Be familiar with truth tables and how to use them for analysis and design.</li> <li>3. Using switching algebra and the implementation of switching functions using the common gates AND, OR, NOT, NAND, NOR, Exclusive-OR, and Exclusive-NOR.</li> <li>4. Simplification combinational logic circuits by using Karnaugh map.</li> <li>5. Analyze and design combinational larger logic circuits.</li> <li>6. Analyze sequential logic circuits.</li> <li>7. Ability to analyze and design a system, component, or process to meet desired needs.</li> <li>8. Ability to analyze, design and conduct experiments.</li> <li>9. In addition to the measurable student learning outcomes listed above, the students will be able to demonstrate their knowledge of the course material by Analyze real problems through laboratory experiments.</li> <li>10. The ability to apply their skills in a variety of practical sciences.</li> </ol> |

## Indicative Contents

المحتويات الإرشادية

### 1. Number systems

- Positional number system.
- Binary digits(bits).
- Convert from binary to decimal.
- Decimal to binary.
- Hexadecimal (hex).
- Octal numbering systems.
- Converting between the four numbering systems (decimal, binary, Hex and octal).
- Fraction of number system.
- Signed and unsigned binary numbers.
- Two's complement, binary addition.
- Subtraction.
- Binary coded decimal (BCD) codes.
- ASCII code.
- Gray code.

### 2. Combinational Logic Circuits and switching algebra.

- Switching algebra.
- Properties of switching algebra.
- Development of a truth table.
- Manipulating algebraic functions.
- Sum of products (SOP).
- Product of sum (POS).

### 3. Switching algebra and logic gates.

- Implementation of switching functions using networks of AND gates.
- OR gates.
- NOT gates.
- DeMorgan's theorem.
- From truth table to algebraic expression.
- Exclusive-OR gates
- Simplifying algebraic expressions.
- Consensus operator.

### 4. Karnaugh map.

- Two, three, and four-variable Karnaugh map.
- Minimum SOP expressions using the Karnaugh map.
- Finding a minimum product of sums (POS) expression.

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Five and six-variable Karnaugh map.</li> <li>• Economize by sharing gates.</li> </ul> <p><b>5. Designing Combinational system.</b></p> <ul style="list-style-type: none"> <li>• Design 1-bit and 2-bits full adder design 1-bit subtractor.</li> <li>• Subtractor/ adder.</li> <li>• Comparators.</li> <li>• Binary decoders.</li> <li>• Binary encoder.</li> <li>• Multiplexe and Demultiplexe.</li> </ul> <p><b>6. Analysis of sequential systems.</b></p> <ul style="list-style-type: none"> <li>• D, S-R, T.</li> <li>• J-K flip flops.</li> <li>• flip flop with clear and present inputs, timing for flip flop.</li> <li>• Moore model circuit.</li> <li>• Mealy model analysis.</li> </ul> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises through class and laboratory experiments. The objective of this module is to serve as a cornerstone for the learning of logic design, digital system design, and computer design by students. At the same time, discussion of combinational logic: logic gates, minimization techniques, arithmetic circuits, and modern logic devices such as field programmable logic gates. This will be accomplished through group discussions, classes, reports, feedback, assignments, and interactive tutorials and by considering types of simple experiments, and exercises that are interesting to the students.</p> |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

|                                         |    |                                      |   |
|-----------------------------------------|----|--------------------------------------|---|
| <b>Structured SWL (h/sem)</b>           |    | <b>Structured SWL (h/w)</b>          |   |
| الحمل الدراسي المنتظم للطالب خلال الفصل | 79 | الحمل الدراسي المنتظم للطالب أسبوعيا | 5 |

|                                                                                |            |                                                                           |     |
|--------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------|-----|
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 63         | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | <b>125</b> |                                                                           |     |

## Module Evaluation

### تقييم المادة الدراسية

|                             |                        | Time/Number | Weight (Marks)   | Week Due        | Relevant Learning Outcome |
|-----------------------------|------------------------|-------------|------------------|-----------------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>         | 4           | 10% (10)         | 2, 5, 8, and 12 | LO#1-5                    |
|                             | <b>Assignments</b>     | 2           | 10% (10)         | 2 and 12        | LO #1-6                   |
|                             | <b>Projects / Lab.</b> | 1           | 10% (10)         | Continuous      | All                       |
|                             | <b>Report</b>          | 1           | 10% (10)         | 13              | LO #3-5                   |
| <b>Summative assessment</b> | <b>Midterm Exam</b>    | 2hr         | 10% (10)         | 7               | LO #1 - #5                |
|                             | <b>Final Exam</b>      | 3hr         | 50% (50)         | 16              | All                       |
| <b>Total assessment</b>     |                        |             | 100% (100 Marks) |                 |                           |

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

|               | Material Covered |
|---------------|------------------|
| <b>Week 1</b> | Number Systems.  |
| <b>Week 2</b> | Number Systems.  |
| <b>Week 3</b> | Number Systems.  |

|                |                                                     |
|----------------|-----------------------------------------------------|
| <b>Week 4</b>  | Number Systems.                                     |
| <b>Week 5</b>  | Combinational Logic Circuits and switching algebra. |
| <b>Week 6</b>  | Combinational Logic Circuits and switching algebra. |
| <b>Week 7</b>  | Switching algebra and logic gates.                  |
| <b>Week 8</b>  | Switching algebra and logic gates.                  |
| <b>Week 9</b>  | Switching algebra and logic gates.                  |
| <b>Week 10</b> | <b>Mid-term Exam.</b>                               |
| <b>Week 11</b> | Karnaugh map.                                       |
| <b>Week 12</b> | Karnaugh map.                                       |
| <b>Week 13</b> | Designing Combinational system.                     |
| <b>Week 14</b> | Designing Combinational system.                     |
| <b>Week 15</b> | Designing Combinational system.                     |
| <b>Week 16</b> | <b>Preparatory week before the final Exam</b>       |

### Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي للمختبر

|               | <b>Material Covered</b>                                                                                                                                                                           |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 1</b> | Introduction to Logic circuit design software and installation method.                                                                                                                            |
| <b>Week 2</b> | Learning how to choose the appropriate software of in logic circuits design that are easy to use and have sustainability.<br><br>Learning how to use interfaces of logic circuits design program. |
| <b>Week 3</b> | Introduction Logic Gates.<br><br>AND Gate and Logic Diagram.<br><br>Examples with Exercises.                                                                                                      |

|                |                                                                                                                                                                                                                         |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 4</b>  | OR Gate and Logic Diagram.<br>Examples with Exercises.                                                                                                                                                                  |
| <b>Week 5</b>  | NOT Gate and Logic Diagram.<br>Examples with Exercises.                                                                                                                                                                 |
| <b>Week 6</b>  | NAND Gate and Logic Diagram.<br>Examples with Exercises.                                                                                                                                                                |
| <b>Week 7</b>  | NOR Gate and Logic Diagram.<br>Examples with Exercises.                                                                                                                                                                 |
| <b>Week 8</b>  | XOR Gate and Logic Diagram.<br>Examples with Exercises.                                                                                                                                                                 |
| <b>Week 9</b>  | XNOR Gate and Logic Diagram.<br>Examples with Exercises.                                                                                                                                                                |
| <b>Week 10</b> | Logic circuits and solving problems.<br>Drawing the truth table from a given logic circuit.<br>Designing a logic circuit from a given problem and testing it by also drawing a truth table.<br>Examples with Exercises. |
| <b>Week 11</b> | Boolean Algebra.<br>Distributive Law.<br>Rules of Boolean Algebra.<br>Boolean Expression/Function.<br>Examples with Exercises.                                                                                          |
| <b>Week 12</b> | De Morgan's Theorems.<br>Examples: using Boolean Algebra techniques<br>Learn how to Work in groups.<br>Examples with Exercises.                                                                                         |
| <b>Week 13</b> | Standard Form of Boolean Expressions<br>All Boolean expressions, regardless of their form, can be converted into two standard forms:                                                                                    |

|                |                                                                                                                                                         |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | <ul style="list-style-type: none"> <li>▪ The sum- of – products form.</li> <li>▪ The product –of- sums form.</li> </ul> <p>Examples with Exercises.</p> |
| <b>Week 14</b> | <p>How to construct Full -Adder from two Half –Adders with Logic circuit</p> <p>Examples with Exercises.</p>                                            |
| <b>Week 15</b> | <p>Exercises in general.</p> <ul style="list-style-type: none"> <li>• Work in groups</li> </ul>                                                         |
| <b>Week 16</b> | <b>Preparatory week before the final Exam through test students.</b>                                                                                    |

## Learning and Teaching Resources

### مصادر التعلم والتدريس

|                       | Text                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Available in the Library? |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b> | <ol style="list-style-type: none"> <li>1. Textbook 1: M. Morris Mano.,” Digital Design”, Published by McGraw-Hill, 3rd edition (2004)</li> <li>2. Morris Mano M, “Digital Logic and Computer Design”, Prentice Hall, New Delhi (2006).</li> <li>3. Alan B. Marcovitz - Introduction to Logic Design, 3rd Edition -McGraw-Hill (2009).</li> <li>4. Charles H. Roth Jr., Larry L Kinney - Fundamentals of Logic Design, 6th Edition-CL Engineering (2009).</li> </ol> | Yes                       |

## Grading Scheme

### مخطط الدرجات

| Group                               | Grade                | التقدير | Marks %  | Definition                     |
|-------------------------------------|----------------------|---------|----------|--------------------------------|
| <b>Success Group<br/>(50 - 100)</b> | <b>A - Excellent</b> | امتياز  | 90 - 100 | Outstanding Performance        |
|                                     | <b>B - Very Good</b> | جيد جدا | 80 - 89  | Above average with some errors |
|                                     | <b>C - Good</b>      | جيد     | 70 - 79  | Sound work with notable errors |

|                   |                         |                     |         |                                       |
|-------------------|-------------------------|---------------------|---------|---------------------------------------|
|                   | <b>D - Satisfactory</b> | متوسط               | 60 - 69 | Fair but with major shortcomings      |
|                   | <b>E - Sufficient</b>   | مقبول               | 50 - 59 | Work meets minimum criteria           |
| <b>Fail Group</b> | <b>FX – Fail</b>        | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| <b>(0 – 49)</b>   | <b>F – Fail</b>         | راسب                | (0-44)  | Considerable amount of work required  |
|                   |                         |                     |         |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 3

### MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

|                             |                                                               |                               |                                                                                                                                                                                                                                                     |
|-----------------------------|---------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Information</b>   |                                                               |                               |                                                                                                                                                                                                                                                     |
| معلومات المادة الدراسية     |                                                               |                               |                                                                                                                                                                                                                                                     |
| Module Title                | <b>Coding and Information Theory</b><br>نظرية معلومات و ترميز |                               | Module Delivery                                                                                                                                                                                                                                     |
| Module Type                 | Core                                                          |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                 | CyS109                                                        |                               |                                                                                                                                                                                                                                                     |
| ECTS Credits                | 6                                                             |                               |                                                                                                                                                                                                                                                     |
| SWL (hr/sem)                | 150                                                           |                               |                                                                                                                                                                                                                                                     |
| Module Level                | 1                                                             | Semester of Delivery          | 2                                                                                                                                                                                                                                                   |
| Administering Department    | CyS                                                           | College                       | College of Computer Science and information Technology                                                                                                                                                                                              |
| Module Leader               | Name                                                          | e-mail                        | E-mail                                                                                                                                                                                                                                              |
| Module Leader's Acad. Title | Professor                                                     | Module Leader's Qualification | Ph.D.                                                                                                                                                                                                                                               |

|                                    |                     |                |        |
|------------------------------------|---------------------|----------------|--------|
| Module Tutor                       | Name (if available) | e-mail         | E-mail |
| Peer Reviewer Name                 | Name                | e-mail         | E-mail |
| Scientific Committee Approval Date | 1/10/2023           | Version Number | 1.0    |

## Module 4

### MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

|                                    |                                                    |                               |                                                                                                                                                                                                                                                     |
|------------------------------------|----------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Information                 |                                                    |                               |                                                                                                                                                                                                                                                     |
| معلومات المادة الدراسية            |                                                    |                               |                                                                                                                                                                                                                                                     |
| Module Title                       | Cyber Security Principles<br>مبادئ الامن السيبراني |                               | Module Delivery                                                                                                                                                                                                                                     |
| Module Type                        | Core                                               |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | CyS109                                             |                               |                                                                                                                                                                                                                                                     |
| ECTS Credits                       | 6                                                  |                               |                                                                                                                                                                                                                                                     |
| SWL (hr/sem)                       | 150                                                |                               |                                                                                                                                                                                                                                                     |
| Module Level                       | 1                                                  | Semester of Delivery          | 1                                                                                                                                                                                                                                                   |
| Administering Department           | CyS                                                | College                       | College of Computer Science and Information Technology                                                                                                                                                                                              |
| Module Leader                      | Name                                               | e-mail                        | E-mail                                                                                                                                                                                                                                              |
| Module Leader's Acad. Title        | Professor                                          | Module Leader's Qualification | Ph.D.                                                                                                                                                                                                                                               |
| Module Tutor                       | Name (if available)                                | e-mail                        | E-mail                                                                                                                                                                                                                                              |
| Peer Reviewer Name                 | Name                                               | e-mail                        | E-mail                                                                                                                                                                                                                                              |
| Scientific Committee Approval Date | 01/10/2023                                         | Version Number                | 1.0                                                                                                                                                                                                                                                 |

Relation with other Modules

| العلاقة مع المواد الدراسية الأخرى |      |          |  |
|-----------------------------------|------|----------|--|
| Prerequisite module               | None | Semester |  |
| Co-requisites module              | None | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | The aim of this course is to equip students with a strong foundation in cybersecurity principles and practices. By the end of the course, students will have a deep understanding of cybersecurity concepts, be able to recognize and mitigate common security threats, and appreciate the ethical and legal aspects of cybersecurity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <p>By the end of this course, students will:</p> <ol style="list-style-type: none"> <li>1. Understand Cybersecurity Fundamentals: Gain a strong foundation in cybersecurity principles, terminologies, and concepts.</li> <li>2. Identify Security Threats: Recognize common cybersecurity threats and vulnerabilities.</li> <li>3. Implement Security Measures: Learn practical strategies and tools to secure digital systems and networks.</li> <li>4. Analyze Security Incidents: Develop skills to investigate and respond to security incidents.</li> <li>5. Promote Cybersecurity Awareness: Understand the importance of cybersecurity in today's digital world and promote best practices.</li> <li>6. Incident Response and Recovery: Students should be capable of developing and implementing an incident response plan, as well as understanding the steps involved in responding to and recovering from cybersecurity incidents.</li> <li>7. Legal and Ethical Considerations: Students should have an awareness of the legal and ethical aspects of cybersecurity, including compliance with relevant laws and regulations, ethical hacking, and the consequences of cybercrimes.</li> </ol> |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | The indicative contents of the "Cyber Security Principles" course include an introduction to cybersecurity fundamentals, exploration of the cyber threat landscape, information security principles, network security, cryptography, access control and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

|  |                                                                                                                                                                                            |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | authentication, incident response, and legal and ethical considerations. These topics collectively provide students with a holistic understanding of cybersecurity concepts and practices. |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | The course employs a combination of teaching strategies, including lectures, interactive discussions, hands-on labs, and group projects. These strategies foster active engagement and practical application of cybersecurity principles, ensuring students grasp theoretical concepts while gaining valuable real-world experience. Additionally, guest lectures by industry experts and participation in cybersecurity-related events enhance students' exposure to current industry practices and challenges. |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Student Workload (SWL)

### الحمل الدراسي للطالب

|                                                                                |     |                                                                            |     |
|--------------------------------------------------------------------------------|-----|----------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 49  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعياً       | 3.2 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 76  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعياً | 5   |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 125 |                                                                            |     |

## Module Evaluation

### تقييم المادة الدراسية

|                      |                 | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
|----------------------|-----------------|-------------|------------------|------------|---------------------------|
| Formative assessment | Quizzes         | 2           | 10% (10)         | 5, 10      | LO #1, 2, 3               |
|                      | Assignments     | 2           | 10% (10)         | 2, 12      | LO # 3, 4, 6              |
|                      | Projects / Lab. | 1           | 10% (10)         | Continuous | All                       |
|                      | Report          | 1           | 10% (10)         | 13         | LO # 5, 7                 |
| Summative assessment | Midterm Exam    | 2 hr        | 10% (10)         | 7          | LO # 1-7                  |
|                      | Final Exam      | 2 hr        | 50% (50)         | 16         | All                       |
| Total assessment     |                 |             | 100% (100 Marks) |            |                           |

## Delivery Plan (Weekly Syllabus)

### المنهاج الأسبوعي النظري

|         | Material Covered                                                                                                 |
|---------|------------------------------------------------------------------------------------------------------------------|
| Week 1  | Introduction to Cyber Security<br>Definition and importance of cybersecurity.                                    |
| Week 2  | Historical development and evolution of cyber threats.<br>Ethical and legal considerations in cybersecurity.     |
| Week 3  | Cyber Threat Landscape<br>Types of cyber threats (e.g., malware, phishing, DDoS attacks).                        |
| Week 4  | Understanding threat actors and motivations.                                                                     |
| Week 5  | Information Security Principles<br>Confidentiality, integrity, and availability (CIA triad).                     |
| Week 6  | Security policies, standards, and guidelines.                                                                    |
| Week 7  | Network Security<br>Network security basics.                                                                     |
| Week 8  | Firewalls, intrusion detection systems (IDS), and intrusion prevention systems (IPS).                            |
| Week 9  | Cryptography<br>Principles of encryption and decryption.                                                         |
| Week 10 | Cryptographic algorithms and protocols.                                                                          |
| Week 11 | Access Control and Authentication<br>User authentication methods (e.g., passwords, multi-factor authentication). |
| Week 12 | Role-based access control (RBAC) and permissions.                                                                |
| Week 13 | Security Incidents and Response<br>Identifying and responding to security incidents.                             |
| Week 14 | Developing an incident response plan.                                                                            |
| Week 15 | Final Review and Examination                                                                                     |

## Delivery Plan (Weekly Lab. Syllabus)

### المنهاج الاسبوعي للمختبر

|        | Material Covered                                                        |
|--------|-------------------------------------------------------------------------|
| Week 1 | Lab1: Introduction to Lab Environment<br>Setting up the lab environment |
| Week 2 | Lab 2: introduction to lab tools and resources.                         |
| Week 3 | Lab 3: Vulnerability Assessment (Aligned with Cyber Threat Landscape)   |

|         |                                                                                                                                                             |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | Conducting vulnerability scans.                                                                                                                             |
| Week 4  | Lab 4: Identifying and prioritizing vulnerabilities.                                                                                                        |
| Week 5  | Lab 5: Network Monitoring (Aligned with Network Security)<br>Monitoring network traffic and anomalies.                                                      |
| Week 6  | Lab 6: Analyzing network logs and events.                                                                                                                   |
| Week 7  | Lab 7: Ethical Hacking (Aligned with Ethical Hacking)<br>Introduction to ethical hacking.                                                                   |
| Week 8  | Lab8: Performing ethical hacking exercises.                                                                                                                 |
| Week 9  | Lab9: Incident Response (Aligned with Security Incidents and Response)<br>Developing an incident response plan.                                             |
| Week 10 | Lab10: Identifying, analyzing, and mitigating security incidents.                                                                                           |
| Week 11 | Lab11: Security Solutions (Aligned with Security Solutions)<br>Configuring and deploying security solutions (e.g., firewalls, intrusion detection systems). |
| Week 12 | Lab12: Conducting security assessments.                                                                                                                     |
| Week 13 | Lab13: Group Projects (Aligned with Various Topics)                                                                                                         |
| Week 14 | Lab14: Collaborative group projects on cybersecurity scenarios.                                                                                             |
| Week 15 | Lab15: Final Lab Review and Assessment (Aligned with Final Review and Examination)                                                                          |

## Learning and Teaching Resources

### مصادر التعلم والتدريس

|                   | Text                                                                                                                       | Available in the Library? |
|-------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Required Texts    | <b>"Cybersecurity: Principles and Practice" by William Stallings and Lawrie Brown</b>                                      | No                        |
| Recommended Texts | <b>"Introduction to Computer and Network Security: Navigating Shades of Gray" by Timothy Shimeall and Jonathan Spring:</b> | No                        |
| Websites          |                                                                                                                            |                           |

## Grading Scheme

### مخطط الدرجات

| Group                       | Grade         | التقدير | Marks (%) | Definition                     |
|-----------------------------|---------------|---------|-----------|--------------------------------|
| Success Group<br>(50 - 100) | A - Excellent | امتياز  | 90 – 100  | Outstanding Performance        |
|                             | B - Very Good | جيد جدا | 80 – 89   | Above average with some errors |

|                        |                  |                     |         |                                       |
|------------------------|------------------|---------------------|---------|---------------------------------------|
|                        | C - Good         | جيد                 | 70 – 79 | Sound work with notable errors        |
|                        | D - Satisfactory | متوسط               | 60 – 69 | Fair but with major shortcomings      |
|                        | E - Sufficient   | مقبول               | 50 – 59 | Work meets minimum criteria           |
| Fail Group<br>(0 – 49) | FX – Fail        | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
|                        | F – Fail         | راسب                | (0-44)  | Considerable amount of work required  |
|                        |                  |                     |         |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 5

### MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| Module Information          |                       |                               |                                                                                                                                                                                                                               |  |
|-----------------------------|-----------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية     |                       |                               |                                                                                                                                                                                                                               |  |
| Module Title                | English II<br>إنكليزي |                               | Module Delivery                                                                                                                                                                                                               |  |
| Module Type                 | Basic                 |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Code                 | CyB 111               |                               |                                                                                                                                                                                                                               |  |
| ECTS Credits                | 3                     |                               |                                                                                                                                                                                                                               |  |
| SWL (hr/sem)                | 75                    |                               |                                                                                                                                                                                                                               |  |
| Module Level                | 1                     | Semester of Delivery          | 2                                                                                                                                                                                                                             |  |
| Administering Department    | CyB                   | College                       | CSIT                                                                                                                                                                                                                          |  |
| Module Leader               |                       | e-mail                        |                                                                                                                                                                                                                               |  |
| Module Leader's Acad. Title | Professor             | Module Leader's Qualification | Ph.D.                                                                                                                                                                                                                         |  |

|                                           |         |                       |     |
|-------------------------------------------|---------|-----------------------|-----|
| <b>Module Tutor</b>                       |         | <b>e-mail</b>         |     |
| <b>Peer Reviewer Name</b>                 |         | <b>e-mail</b>         |     |
| <b>Scientific Committee Approval Date</b> | / /2023 | <b>Version Number</b> | 1.0 |

|                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                 |  |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--|
| <b>Relation with other Modules</b><br>العلاقة مع المواد الدراسية الأخرى                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                 |  |
| <b>Prerequisite module</b>                                                                                                | CyB105                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Semester</b> |  |
| <b>Co-requisites module</b>                                                                                               | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Semester</b> |  |
| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                 |  |
| <b>Module Objectives</b><br>أهداف المادة الدراسية                                                                         | 4. Developing communication approaches.<br>5. Enhancing total physical response (TPR).<br>6. Establishing multi-outcome learning (English and science knowledge for instance).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                 |  |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية                                                          | 10. <b>Improved Communication Skills:</b> Students should be able to communicate more effectively in English, expressing themselves with greater fluency and accuracy. They can participate in everyday conversations, express opinions, and discuss various topics.<br>11. <b>Expanded Vocabulary:</b> Learners should have developed a broader range of vocabulary, allowing them to understand and use a wider variety of words and expressions.<br>12. <b>Grammar Proficiency:</b> Students are expected to have a better grasp of English grammar, allowing them to construct more complex sentences and convey different tenses and aspects more accurately.<br>13. <b>Reading Comprehension:</b> Learners should be able to read and comprehend a variety of texts, such as articles, short stories, and excerpts from novels, with |                 |  |

|                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                              | <p>a reasonable level of understanding.</p> <p>14. <b>Writing Skills:</b> Students should be able to write coherent paragraphs and short texts, such as emails, letters, and simple essays, demonstrating improved sentence structure and organization.</p> <p>15. <b>Listening Skills:</b> Learners should have developed better listening skills, allowing them to understand and follow conversations, interviews, and media in English with less difficulty.</p> <p>16. <b>Cultural Awareness:</b> At this level, students may have been exposed to various cultural aspects of English-speaking countries, leading to a better understanding of cultural norms and customs.</p> <p>17. <b>Independent Learning:</b> Students should be more confident and independent in their language learning journey, taking initiatives to practice and learn outside of the classroom.</p> <p>18. <b>Preparation for Advanced Levels:</b> English Level II usually serves as a foundation for more advanced language courses. After completing this level, students should be ready to progress to higher-level language studies.</p> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p> | <p>International student:</p> <p>READING: Going abroad to study.</p> <ul style="list-style-type: none"> <li>• Following instructions: filling in forms</li> <li>• Reading methods: skim; scan; intensive reading; extensive reading</li> </ul> <p>WRITING: A host family</p> <ul style="list-style-type: none"> <li>• Checking your writing: error correction - punctuation and spelling</li> <li>• Writing an informal email</li> </ul> <p>Where in the world:</p> <p>READING: Three countries</p> <ul style="list-style-type: none"> <li>• Skimming and scanning: reading for the general idea, and for particular information</li> </ul> <p>WRITING: My country</p> <ul style="list-style-type: none"> <li>• Brain storming ideas: topic areas and examples;</li> <li>• completing a paragraph</li> <li>• Linking ideas (1): but, however, although</li> </ul>                                                                                                                                                                                                                                                                |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Writing a description of my country</li> </ul> <p>Newspaper articles:</p> <p>READING: An unexpected journey</p> <ul style="list-style-type: none"> <li>• Predicting content: using the title and the pictures</li> <li>• Meaning from context: guessing the meaning of new words</li> </ul> <p>WRITING My country</p> <ul style="list-style-type: none"> <li>• Brainstorming ideas: topic areas and examples; completing a paragraph</li> <li>• Linking ideas (1): but, however, although Writing a description of my country</li> </ul> <p>Modern technology:</p> <p>READING Innovation</p> <ul style="list-style-type: none"> <li>• Purpose and audience (1 and 2): using visual and written clues</li> </ul> <p>WRITING Mistaken identity</p> <ul style="list-style-type: none"> <li>• Sentences/Paragraphs; helping your writing flow</li> <li>• Varying the structure: making writing interesting Writing an article</li> </ul> <p>Conferences and visits</p> <p>READING: A conference in Istanbul</p> <ul style="list-style-type: none"> <li>• Purpose and audience (1 and 2): using visual and written clues</li> </ul> <p>WRITING Invitations</p> <ul style="list-style-type: none"> <li>• Using formal expressions: writing academic emails and letters</li> <li>• Writing a formal email</li> </ul> <p>Science and our world:</p> <p>READING: Air pollution</p> <ul style="list-style-type: none"> <li>• Making notes: organizing recording, and remembering important information</li> <li>• Interpreting meaning; recognizing fact and speculation</li> </ul> <p>WRITING Technology - good or bad?</p> <ul style="list-style-type: none"> <li>• Organizing ideas (1): planning the arguments for and against</li> </ul> |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- Linking ideas (2): first, for instance, in conclusion ... Writing a discursive essay

People: past and present

READING: Three famous writers

- Using original sources: dealing with difficult language and
- unknown vocabulary

WRITING: Trends

- Paraphrasing and summarizing: using other sources
- Writing a summary

The world of IT:

READING: Computers

- Rephrasing and explaining; dealing with difficult scientific and
- technological words
- Avoiding repetition (2): pronouns and what they refer to

WRITING: IT - benefits and drawbacks

- Linking ideas (3): cause and result Coherent writing; writing up notes
- Writing from notes

Inventions, discoveries, and processes:

READING: How things work

- Intensive reading: strategies for focusing your reading
- Linking ideas (4); sequencing words to describe a process

WRITING How things are made

- The passive voice; writing in neutral style
- Clarifying a sequence: describing a process
- Writing a description of a process

Travel and tourism:

READING: International tourism

- Interpreting data: statistical information in graphs, charts, and texts

VOCABULARY DEVELOPMENT Varying vocabulary (2)

|  |                                                                                                                                                     |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• A voiding repetition (3): describing graphs using synonyms, adjectives + nouns, verbs + adverbs</li> </ul> |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>For Teachers:</p> <ol style="list-style-type: none"> <li>9. <b>Interactive and Communicative Approach:</b> Encourage students to engage in meaningful conversations, discussions, and role-plays. This approach emphasizes real-life communication and helps students practice using English in different contexts.</li> <li>10. <b>Error Correction:</b> Provide constructive feedback on students' errors without discouraging them. Focus on correcting essential mistakes that hinder communication while praising their efforts to build confidence.</li> <li>11. <b>Contextual Learning:</b> Use authentic materials like articles, videos, and short stories to introduce new vocabulary and grammar in relevant contexts. This helps students understand language usage in real-life situations.</li> <li>12. <b>Task-Based Learning:</b> Design activities and tasks that require students to use English to complete meaningful projects or solve problems. This approach fosters critical thinking and language application skills.</li> <li>13. <b>Grammar in Context:</b> Teach grammar points within the context of authentic texts or dialogues. This helps students see how grammar functions in real communication rather than just learning rules in isolation.</li> <li>14. <b>Encourage Reading:</b> Assign reading materials suited to the students' proficiency level. Reading improves vocabulary, comprehension, and exposes students to different writing styles.</li> <li>15. <b>Listening Practice:</b> Provide opportunities for listening exercises, such as watching English-language videos, movies, or podcasts. This enhances listening skills and exposes students to different accents and speech patterns.</li> <li>16. <b>Writing Practice:</b> Assign writing tasks like essays, emails, or short stories. Provide feedback on their writing to improve their skills gradually.</li> </ol> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>For Students:</p> <ol style="list-style-type: none"> <li><b>Consistent Practice:</b> Regularly practice reading, writing, listening, and speaking in English. Consistency is crucial for improvement.</li> <li><b>Use Language Apps and Online Resources:</b> Utilize language learning apps and online resources to reinforce learning, expand vocabulary, and improve grammar.</li> <li><b>Join Language Exchange Groups:</b> Engage in language exchange programs or groups where you can practice speaking English with native speakers or other learners.</li> <li><b>Set Goals:</b> Establish clear language learning goals and track your progress. Celebrate achievements and milestones.</li> <li><b>Immerse Yourself:</b> Surround yourself with English as much as possible. Watch English movies, TV shows, and listen to English music or podcasts.</li> <li><b>Keep a Language Journal:</b> Write down new words, expressions, and grammar rules you learn. Review and practice them regularly.</li> <li><b>Practice with Different Media:</b> Practice English through various mediums like reading books, watching documentaries, listening to news, or participating in online forums.</li> <li><b>Be Patient and Persistent:</b> Language learning takes time and effort. Stay motivated and persistent even if you encounter challenges</li> </ol> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                  |    |                                                                    |     |
|-------------------------------------------------------------------------|----|--------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا                                 |    |                                                                    |     |
| Structured SWL (h/sem)<br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 33 | Structured SWL (h/w)<br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 2   |
| Unstructured SWL (h/sem)<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 42 | Unstructured SWL (h/w)<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 2.8 |
| Total SWL (h/sem)                                                       | 75 |                                                                    |     |

|                                       |  |
|---------------------------------------|--|
| الحمل الدراسي الكلي للطالب خلال الفصل |  |
|---------------------------------------|--|

| Module Evaluation     |              |             |                  |          |                           |
|-----------------------|--------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية |              |             |                  |          |                           |
|                       |              | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment  | Quizzes      | 2           | 10% (10)         | 5 and 10 | LO #1, #2 and #10,        |
|                       | Assignments  | 2           | 10% (10)         | 2 and 12 | LO #3, #4 and #6, #7      |
|                       | Report       | 1           | 20% (10)         | 13       | LO #5, #8 and #10         |
| Summative assessment  | Midterm Exam | 2hr         | 10% (10)         | 7        | LO #1 - #7                |
|                       | Final Exam   | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment      |              |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                          |
|---------------------------------|--------------------------|
| المنهاج الاسبوعي النظري         |                          |
|                                 | Material Covered         |
| Week 1                          | International student    |
| Week 2                          | Where in the world       |
| Week 3                          | Newspaper articles       |
| Week 4                          | Conferences and visits   |
| Week 5                          | Science and our world    |
| Week 6                          | Midterm exam             |
| Week 7                          | People: past and present |

|                |                                        |
|----------------|----------------------------------------|
| <b>Week 8</b>  | The world of IT                        |
| <b>Week 9</b>  | Inventions, discoveries, and processes |
| <b>Week 10</b> | Travel and tourism                     |
| <b>Week 11</b> | Final exam                             |

## Learning and Teaching Resources

### مصادر التعلم والتدريس

|                          | <b>Text</b>                                                                                                  | <b>Available in the Library?</b> |
|--------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------|
| <b>Required Texts</b>    | Sarah Philpot. Headway: Academic skills- reading, writing, and study skills. LEVEL 2 Student's Book. Oxford. | Yes                              |
| <b>Recommended Texts</b> |                                                                                                              |                                  |
| <b>Websites</b>          |                                                                                                              |                                  |

## Grading Scheme

### مخطط الدرجات

| <b>Group</b>                        | <b>Grade</b>            | <b>التقدير</b>      | <b>Marks %</b> | <b>Definition</b>                     |
|-------------------------------------|-------------------------|---------------------|----------------|---------------------------------------|
| <b>Success Group<br/>(50 - 100)</b> | <b>A - Excellent</b>    | امتياز              | 90 - 100       | Outstanding Performance               |
|                                     | <b>B - Very Good</b>    | جيد جدا             | 80 - 89        | Above average with some errors        |
|                                     | <b>C - Good</b>         | جيد                 | 70 - 79        | Sound work with notable errors        |
|                                     | <b>D - Satisfactory</b> | متوسط               | 60 - 69        | Fair but with major shortcomings      |
|                                     | <b>E - Sufficient</b>   | مقبول               | 50 - 59        | Work meets minimum criteria           |
| <b>Fail Group<br/>(0 – 49)</b>      | <b>FX – Fail</b>        | راسب (قيد المعالجة) | (45-49)        | More work required but credit awarded |
|                                     | <b>F – Fail</b>         | راسب                | (0-44)         | Considerable amount of work required  |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 6

### MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| Module Information                 |                            |                               |                                                                                                                                                                                                          |
|------------------------------------|----------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                            |                               |                                                                                                                                                                                                          |
| Module Title                       | Probability and Statistics |                               | Module Delivery                                                                                                                                                                                          |
| Module Type                        | Basic                      |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | CyB112                     |                               |                                                                                                                                                                                                          |
| ECTS Credits                       | 5                          |                               |                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 125                        |                               |                                                                                                                                                                                                          |
| Module Level                       | 1                          | Semester of Delivery          | 2                                                                                                                                                                                                        |
| Administering Department           | CyS                        | College                       | College of Computer Science and Information Technology                                                                                                                                                   |
| Module Leader                      |                            | e-mail                        |                                                                                                                                                                                                          |
| Module Leader's Acad. Title        |                            | Module Leader's Qualification | Ph.D.                                                                                                                                                                                                    |
| Module Tutor                       | Name (if available)        | e-mail                        | E-mail                                                                                                                                                                                                   |
| Peer Reviewer Name                 | Name                       | e-mail                        | E-mail                                                                                                                                                                                                   |
| Scientific Committee Approval Date | 01/06/2023                 | Version Number                | 1.0                                                                                                                                                                                                      |

## Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

|                            |          |                 |   |
|----------------------------|----------|-----------------|---|
| <b>Prerequisite module</b> | Calculus | <b>Semester</b> | 1 |
|----------------------------|----------|-----------------|---|

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية                      | <ol style="list-style-type: none"> <li>1. It gives the student a broader idea of the possibility of things happening.</li> <li>2. The probability of things gives more opportunity for imagination.</li> <li>3. The moment- generating function gives him more opportunity to deal with the derivative of the moment- generating function.</li> <li>4. The student will be qualified in the next stage to deal with probability and statistics, especially in the subject of simulation.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | <ol style="list-style-type: none"> <li>1. Understand the vocabulary of probability and statistics.</li> <li>2. Understanding the nature of statistics as an integrated system of knowledge.</li> <li>3. The ability to solve complex statistical problems.</li> <li>4. Be able to choose appropriate statistical tests and methods based on the characteristics of the data and research questions.</li> <li>5. Develop a solid understanding of probability theory, including the rules of probability, probability distributions, random variables, and the concept of expected value.</li> <li>6. Learn to interpret and visualize data effectively through techniques like graphs, charts, and summary statistics.</li> <li>7. Apply probability concepts to real-world situations, such as understanding uncertainty in various contexts.</li> <li>8. Apply these principles to make inferences about populations based on sample data, such as estimating population parameters and testing hypotheses.</li> <li>9. Develop critical thinking skills to assess the validity and relevance of statistical analyses and their implications.</li> <li>10. Apply statistical reasoning to make informed decisions in various fields, such as business, science, social sciences, and healthcare.</li> </ol> |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | Indicative content includes the following.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Part A – permutations and combinations</p> <p>Permutations mean dealing with ordered things, but harmonics, the order is unimportant.</p> <p>Part B- Probability</p> <p>Probability is a measure of the possibility of an event occurring. Probability is measured as a number between zero and one, where zero indicates impossibility and one indicates certainty. The higher the probability of an event, the greater the possibility of that event occurring.</p> <p>Part C- Distributions</p> <p>Connected and discrete distributions and how to deal with them.</p> |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br><b>استراتيجيات التعلم والتعليم</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                             | <p>Teaching a course in probability and statistics can be challenging due to the abstract nature of the subject and the need to engage students in both theory and practical applications. Here's a strategy for effectively teaching a probability and statistics course:</p> <ul style="list-style-type: none"> <li>• <b>Set Clear Learning Objectives:</b><br/>Begin by defining specific learning objectives for the course. What should students be able to understand and do by the end of the course? Clearly communicate these objectives to students.</li> <li>• <b>Use Real-Life Examples:</b><br/>Start with relatable, real-world examples to introduce concepts. Relating statistics to everyday situations helps students see the practical relevance of the subject.</li> <li>• <b>Build a Strong Foundation:</b><br/>Begin with the fundamentals. Ensure that students have a solid grasp of basic probability theory and concepts before moving on to more advanced topics in statistics.</li> <li>• <b>Encourage Active Learning:</b><br/>Engage students actively through problem-solving, group discussions, and hands-on activities. Encourage them to explore and experiment with data.</li> </ul> |

- **Provide Context:**

Give context to statistical methods by showing their relevance in various fields, such as business, science, healthcare, and social sciences.

- **Use Technology:**

Leverage statistical software (e.g., R, Python, Excel) for practical data analysis. Teach students how to use these tools to analyze and visualize data.

- **Emphasize Critical Thinking:**

Encourage students to think critically about statistical claims and interpretations. Teach them how to assess the validity and reliability of statistical results.

- **Teach Data Visualization:**

Emphasize the importance of data visualization. Show students how to create clear and informative graphs and charts to communicate data effectively.

- **Assess Progress:**

Use a variety of assessment methods, including quizzes, assignments, projects, and exams, to evaluate students' understanding and application of statistical concepts.

- **Provide Feedback:**

Offer constructive feedback on assignments and assessments. Encourage self-assessment and reflection to support continuous improvement.

- **Encourage Collaboration:**

Promote collaboration among students by assigning group projects and facilitating peer-to-peer learning. Encourage them to discuss and solve problems together.

- **Relate to Research:**

Highlight the role of statistics in research, emphasizing the importance of designing experiments, collecting data, and drawing valid conclusions.

- **Solve Real-World Problems:**

Present students with real-world problems or case studies that require the application of statistical methods to find solutions. This can help them see the practical utility of statistics.

- **Foster Ethical Data Handling:**

|  |                                                                                                                                                                                                                                                                                                                                                                                                       |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Discuss ethical issues related to data collection, analysis, and reporting. Teach students the importance of respecting privacy and transparency in statistical work.</p> <ul style="list-style-type: none"> <li>Adapt to Student Needs:<br/>Be flexible and adapt to the needs of the students. Encourage questions and provide additional support for students who may be struggling.</li> </ul> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب                          |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 64  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 4.2 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 86  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 5.7 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 150 |                                                                           |     |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |              |             |                  |            |                           |
|---------------------------------------------------|--------------|-------------|------------------|------------|---------------------------|
|                                                   |              | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | Quizzes      | 2           | 10% (10)         | 5, 10      | LO #1, 2, 10              |
|                                                   | Assignments  | 2           | 10% (10)         | 2, 12      | LO # 3, 4, 6              |
|                                                   | Projects     | 1           | 10% (10)         | Continuous |                           |
|                                                   | Report       | 1           | 10% (10)         | 13         | LO # 5, 8 and 10          |
| <b>Summative assessment</b>                       | Midterm Exam | 2 hr        | 10% (10)         | 7          | LO # 1-10                 |
|                                                   | Final Exam   | 2hr         | 50% (50)         | 16         | All                       |
| <b>Total assessment</b>                           |              |             | 100% (100 Marks) |            |                           |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الأسبوعي النظري |
|-------------------------------------------------------------------|
|-------------------------------------------------------------------|

|         | Material Covered                               |
|---------|------------------------------------------------|
| Week 1  | Introduction - permutations and combinations   |
| Week 2  | Probability                                    |
| Week 3  | Conditional probability and bay's theorem      |
| Week 4  | Connected random variables                     |
| Week 5  | Discrete random variables                      |
| Week 6  | Functions of random variables                  |
| Week 7  | Expectations                                   |
| Week 8  | Variances                                      |
| Week 9  | Moment – generating function                   |
| Week 10 | Joint distributions and marginal distributions |
| Week 11 | Discrete distributions                         |
| Week 12 | Continuous distributions                       |
| Week 13 | First exam                                     |
| Week 14 | Second exam                                    |
| Week 15 | Review important topics                        |
| Week 16 | Preparatory week before the final Exam         |

| Learning and Teaching Resources |                                                                                         |                           |
|---------------------------------|-----------------------------------------------------------------------------------------|---------------------------|
| مصادر التعلم والتدريس           |                                                                                         |                           |
|                                 | Text                                                                                    | Available in the Library? |
| Required Texts                  | كتاب سلسلة من الاحتمالات تأليف سيمور ليبشتز                                             | Yes                       |
| Recommended Texts               | كتاب مقدمة في الإحصاء الرياضي تأليف الدكتور صباح داود سليم                              | yes                       |
| Websites                        | Adobe reader-[simue-pdf]<br>Probability et statistique cours et problemes series schaum |                           |

## Grading Scheme

| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                                         |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                          | A - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | B - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | C - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | D - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | E - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                               | FX – Fail        | راسب (قيد المعالجة) | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | F – Fail         | راسب                | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                  |                     |           |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                  |                     |           |                                       |

## Curriculum for the second Year, First Semester.

### Module 1

#### MODULE DESCRIPTION FORM

#### نموذج وصف المادة الدراسية

| Module Information      |                                               |                                                                                                                                      |
|-------------------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية |                                               |                                                                                                                                      |
| Module Title            | <b>هياكل بيانات</b><br><b>Data Structures</b> | Module Delivery                                                                                                                      |
| Module Type             | Core                                          | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab |
| Module Code             | CyB 202                                       |                                                                                                                                      |
| ECTS Credits            | 6                                             |                                                                                                                                      |

|                                    |                        |                               |                                                                                                                        |  |
|------------------------------------|------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------|--|
| SWL (hr/sem)                       | 175                    |                               | <input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Level                       | 2                      | Semester of Delivery          | 1                                                                                                                      |  |
| Administering Department           | CyB                    | College                       | CSIS                                                                                                                   |  |
| Module Leader                      |                        | e-mail                        |                                                                                                                        |  |
| Module Leader's Acad. Title        | Assist lec.            | Module Leader's Qualification | PHD                                                                                                                    |  |
| Module Tutor                       | Atman Dhiya Abdulsatar | e-mail                        | Athman.dhiya@uobasrah.edu.iq                                                                                           |  |
| Peer Reviewer Name                 | Name                   | e-mail                        | E-mail                                                                                                                 |  |
| Scientific Committee Approval Date | /0/2023                | Version Number                | 1.0                                                                                                                    |  |

|                                                                         |      |          |  |
|-------------------------------------------------------------------------|------|----------|--|
| <b>Relation with other Modules</b><br>العلاقة مع المواد الدراسية الأخرى |      |          |  |
| Prerequisite module                                                     | None | Semester |  |
| Co-requisites module                                                    |      | Semester |  |

|                                                                                                                           |                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                              |
| <b>Module Objectives</b><br>أهداف المادة الدراسية                                                                         | 20. To know what meaning of data structures in computer science and its classification.<br>21. To understand how each data structure store in memory.<br>22. To understand how access to each data structure that store in memory.<br>23. To perform basic operation on each data structure. |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | 24. To implemented each data structure by using any programming language.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | <ol style="list-style-type: none"> <li>1. It provides what mean of data type and data structures.</li> <li>2. Identify classification of data structures and the main operation of them.</li> <li>3. Identify on arrays and discuss the features, main operations, how access to each element and how implementation in java.</li> <li>4. Identify on how representation strings and how create string object in pyhon.</li> <li>5. Identify on linked lists and discuss the features, main operations, types and how implementation in java.</li> <li>6. Identify on stacks and discuss the features, main operations, applications, how implementation in pyhon using arrays and linked lists.</li> <li>7. Discuss how conversation and evaluation the expression using stack.</li> <li>8. Learn how write implantation recursion function by using stack.</li> <li>9. Identify on queues and discuss the features, main operations, applications, how implementation in python using arrays and linked lists.</li> </ol>                                                                                                                                                                                         |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | <p>Many points will be covered such as:</p> <ol style="list-style-type: none"> <li>1. Introduction to Data Structures (Definition and importance of data structures, Basic terminology: data, information, algorithm, etc. , Overview of different types of data structures).</li> <li>2. Arrays (Definition and properties, Array operations: access, insertion, deletion, Multi-dimensional arrays).</li> <li>3. Linked Lists ( Singly linked lists, doubly linked lists, circular linked lists, Basic operations: insertion, deletion, traversal, Applications of linked lists).</li> <li>4. Stacks (Definition and properties, Operations: push, pop, peek, Implementation using arrays and linked lists, Applications of stacks).</li> <li>5. Queues (Definition and properties, Operations: enqueue, dequeue, front, rear, Implementation using arrays and linked lists, Types of queues (e.g., circular queue, priority queue).</li> <li>6. Trees (Binary trees, binary search trees (BST), Tree traversal: in-order, pre-order, post-order, Operations on binary trees: insertion, deletion, searching).</li> <li>7. Graphs (Definition and basic terminology (vertices, edges), Types of graphs</li> </ol> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>(directed, undirected, weighted), Graph representation , (adjacency matrix, adjacency list).</p> <p>8. Hashing ( Hash functions and their properties, Collision resolution techniques, Applications of hashing).</p> <p>9. Sorting ( Comparison-based sorting algorithms (e.g., bubble sort, selection sort, insertion sort, merge sort, quicksort), Non-comparison-based sorting (e.g., counting sort, radix sort).</p> <p>10. Searching ( Linear search, binary search, Searching in trees and graphs).</p> <p>11. Advanced Data Structures (Heaps and priority queues, Disjoint-set data structure (Union-Find), Trie data structure, B-trees).</p> <p>12. Algorithm Analysis (Time complexity and space complexity analysis, Big-O notation, Best, average, and worst-case analysis).</p> <p>13. Dynamic Programming ( Principles of dynamic programming, Memoization and tabulation, Examples of dynamic programming problems).</p> <p>14. Greedy Algorithms ( Principles of greedy algorithms, Examples of greedy algorithmic problems).</p> <p>15. Graph Algorithms ( Shortest path algorithms (Dijkstra's, Bellman-Ford). , Minimum spanning tree algorithms (Prim's, Kruskal's).</p> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and the lab, interactive tutorials, and by considering types of simple experiments involving some sampling activities that are interesting to the students.</p> <p>Different strategies will be utilized to encourage students participation and enhance learning abilities such as (class participation, quizzes, projects, and presentations).</p> |

| Student Workload (SWL)                                                  |     |                                                                    |      |
|-------------------------------------------------------------------------|-----|--------------------------------------------------------------------|------|
| الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا                                 |     |                                                                    |      |
| Structured SWL (h/sem)<br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 77  | Structured SWL (h/w)<br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 5.13 |
| Unstructured SWL (h/sem)<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 73  | Unstructured SWL (h/w)<br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4.86 |
| Total SWL (h/sem)<br>الحمل الدراسي الكلي للطالب خلال الفصل              | 175 |                                                                    |      |

| Module Evaluation     |                 |             |                  |          |                           |
|-----------------------|-----------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |          |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 1           | 10% (10)         | 5        | LO #3- #5 and #7          |
|                       | Assignments     | 2           | 10% (10)         | 3 and 7  | LO #8, #9                 |
|                       | Projects / Lab. | 1           | 10% (10)         | 14       | LO #3- #9                 |
|                       | Report          | 1           | 10% (10)         | -        |                           |
| Summative assessment  | Midterm Exam    | 2hr         | 10% (10)         | 7        | LO #1 - #6                |
|                       | Final Exam      | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |
|---------------------------------|
| المنهاج الاسبوعي النظري         |

|                | Material Covered                                                                                                                             |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 1</b>  | Introduction - Types of Data types, type of data structures                                                                                  |
| <b>Week 2</b>  | Arrays DS: definition, features, logic, physical structure, access equations of one dimensional array.                                       |
| <b>Week 3</b>  | Arrays DS: logic, physical structure, access equations of two dimensional arrays.                                                            |
| <b>Week 4</b>  | Arrays DS: logic, physical structure, access equation of three and multi-dimensional arrays and triangle arrays.                             |
| <b>Week 5</b>  | Strings DS: definition, basic representations in memory, create String object                                                                |
| <b>Week 6</b>  | Linked Lists DS: definition, advantage and disadvantage of arrays and linked lists, basic operations of linked lists, types of linked lists. |
| <b>Week 7</b>  | Mid-term Exam                                                                                                                                |
| <b>Week 8</b>  | Implementation of linked lists                                                                                                               |
| <b>Week 9</b>  | Stack DS: definition, features, implementation using linked lists and Arrays                                                                 |
| <b>Week 10</b> | Stack DS: Application-recursion                                                                                                              |
| <b>Week 11</b> | Stack DS: Application- Expression Conversion                                                                                                 |
| <b>Week 12</b> | Stack DS: Application- evaluating expressions                                                                                                |
| <b>Week 13</b> | Queue DS: definition, features, implementation using linked lists                                                                            |
| <b>Week 14</b> | Queue DS: definition, features, implementation using Arrays                                                                                  |
| <b>Week 15</b> | Queue DS: types of queues                                                                                                                    |
| <b>Week 16</b> | Preparatory week before the final Exam                                                                                                       |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|  | Material Covered |
|--|------------------|
|--|------------------|

|                |                                                                 |
|----------------|-----------------------------------------------------------------|
| <b>Week 1</b>  | Arrays classes in python package                                |
| <b>Week 2</b>  | Tasks in Arrays                                                 |
| <b>Week 3</b>  | Strings methods in python package                               |
| <b>Week 4</b>  | Tasks in Strings                                                |
| <b>Week 5</b>  | <b>1<sup>st</sup> Quiz</b>                                      |
| <b>Week 6</b>  | Linked Lists class in python package                            |
| <b>Week 7</b>  | Tasks in linked lists (single and circular linked lists)        |
| <b>Week 8</b>  | Tasks in linked lists (double and Circular Double Linked Lists) |
| <b>Week 9</b>  | Stack class in python package                                   |
| <b>Week 10</b> | Stack to evaluate expression                                    |
| <b>Week 11</b> | <b>2<sup>nd</sup> Quiz</b>                                      |
| <b>Week 12</b> | Stack class in python package                                   |
| <b>Week 13</b> | Implement queue using arrays                                    |
| <b>Week 14</b> | Implement queue using linked lists                              |
| <b>Week 15</b> | Excercises of queue                                             |
|                |                                                                 |

## Learning and Teaching Resources

### مصادر التعلم والتدريس

|                       | Text                                                                                                                                                        | Available in the Library? |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b> | 1. Data Structures and Algorithms in Java by Michael T. Goodrich, 2022.<br>2. A Textbook of Data Structures and Algorithms by G. A. Vijayalakshmi Pai, 2022 | <b>No</b>                 |

|                          |                                                                                                  |    |
|--------------------------|--------------------------------------------------------------------------------------------------|----|
| <b>Recommended Texts</b> | Hands-On Data Structures and Algorithms with Python by <a href="#">Dr. Basant Agarwal</a> , 2022 | No |
| <b>Websites</b>          |                                                                                                  |    |

| Grading Scheme                                                                                                                                                                                                                                                                                                                                                                              |                         |                     |          |                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                                                |                         |                     |          |                                       |
| Group                                                                                                                                                                                                                                                                                                                                                                                       | Grade                   | التقدير             | Marks %  | Definition                            |
| <b>Success Group</b><br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                          | <b>A – Excellent</b>    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>B - Very Good</b>    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>C – Good</b>         | جيد                 | 70 - 79  | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>D - Satisfactory</b> | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>E – Sufficient</b>   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                               | <b>FX – Fail</b>        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>F – Fail</b>         | راسب                | (0-44)   | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                         |                     |          |                                       |
| <p><b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.</p> |                         |                     |          |                                       |

## Module 2

### MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

|                                                                 |
|-----------------------------------------------------------------|
| <p><b>Module Information</b></p> <p>معلومات المادة الدراسية</p> |
|-----------------------------------------------------------------|

|                                    |                                      |          |                                                                                                                                                                                                                                                     |        |                      |
|------------------------------------|--------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----------------------|
| Module Title                       | <b>Object Oriented Programming I</b> |          | Module Delivery                                                                                                                                                                                                                                     |        |                      |
| Module Type                        | Core                                 |          | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input checked="" type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |        |                      |
| Module Code                        | CyB 201                              |          |                                                                                                                                                                                                                                                     |        |                      |
| ECTS Credits                       | 7                                    |          |                                                                                                                                                                                                                                                     |        |                      |
| SWL (hr/sem)                       | 175                                  |          |                                                                                                                                                                                                                                                     |        |                      |
| Module Level                       |                                      | 2        |                                                                                                                                                                                                                                                     |        | Semester of Delivery |
| Administering Department           |                                      | CyB      | College                                                                                                                                                                                                                                             | CSIS   |                      |
| Module Leader                      |                                      |          | e-mail                                                                                                                                                                                                                                              |        |                      |
| Module Leader's Acad. Title        |                                      | Lecturer | Module Leader's Qualification                                                                                                                                                                                                                       |        | MSc                  |
| Module Tutor                       | Name (if available)                  |          | e-mail                                                                                                                                                                                                                                              | E-mail |                      |
| Peer Reviewer Name                 |                                      | Name     | e-mail                                                                                                                                                                                                                                              | E-mail |                      |
| Scientific Committee Approval Date |                                      | 9/8/2024 | Version Number                                                                                                                                                                                                                                      | 2.0    |                      |

| Relation with other Modules       |                                |          |   |
|-----------------------------------|--------------------------------|----------|---|
| العلاقة مع المواد الدراسية الأخرى |                                |          |   |
| Prerequisite module               | Computer Programming II        | Semester | 2 |
| Co-requisites module              | Object Oriented Prpgramming II | Semester | 4 |

| Module Aims, Learning Outcomes and Indicative Contents   |
|----------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>                | <p>25. Introduce the concepts of object-oriented programming in a higher-level programming language, such Java, and Python.</p> <p>26. Analyze a problem statement to design a model of objects necessary to create software architecture.</p> <p>27. Gain skills in designing, and programming software for reuse of code.</p> <p>28. Establish development methods in object-oriented programming to qualify students for teaching the language in other settings.</p>                                                                                                                                                                                                                |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>1. Understanding the basic concepts of Object Oriented Programming.</li> <li>2. Developing the basic structures of Classes and Objects.</li> <li>3. Using Constructors and Deconstructors and methods in Python.</li> <li>4. Learning the basic concepts of Encapsulation.</li> <li>5. Implementing Polymorphisim in Python.</li> <li>6. Implementing Inheritance in Python.</li> <li>7. Learning the basic concepts of Abstraction.</li> <li>8. Manage object relationships.</li> <li>9. Understanding the basics about using magic methods.</li> <li>10. Understanding of Exceptions in OOP.</li> </ol>                                        |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <ol style="list-style-type: none"> <li>1. Introduction to OOP concepts. <ul style="list-style-type: none"> <li>- What is Object-Oriented Programming?</li> <li>- Key OOP principles: Encapsulation, Abstraction, Inheritance, and Polymorphism.</li> <li>- Benefits of OOP.</li> </ul> </li> <li>2. Classes and Objects. <ul style="list-style-type: none"> <li>- Understanding Classes and Objects.</li> <li>- Define a Class in Python.</li> <li>- Creating Objects (instances) from a class.</li> <li>- Using constructor.</li> </ul> </li> <li>3. Attributes and Methods. <ul style="list-style-type: none"> <li>- Instance Attributes and Class Attributes.</li> </ul> </li> </ol> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>- Using Methods.</li> </ul> <p>4. Encapsulation.</p> <ul style="list-style-type: none"> <li>- Public, Private, and Protected access modifiers.</li> <li>- Getter, and Setter methods.</li> </ul> <p>5. Inheritance.</p> <ul style="list-style-type: none"> <li>- The concepts of Inheritance (parent and child).</li> <li>- Overriding method.</li> <li>- Super() method.</li> </ul> <p>6. Polymorphisim.</p> <ul style="list-style-type: none"> <li>- Polymprphisim with inheritance.</li> <li>- Polymorphisim with functions and objects.</li> </ul> <p>7. Abstraction.</p> <ul style="list-style-type: none"> <li>- The concept of Abstraction.</li> </ul> <p>8. Magic Methods.</p> <ul style="list-style-type: none"> <li>- Understanding Magic methods.</li> </ul> <p>9. Error Handling in OOP.</p> <ul style="list-style-type: none"> <li>- Exception handing in Python.</li> </ul> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>The main strategy that will be adopted in this module through a series of lectures the theoretical underpinnings of meaning of object oriented programming language (such as java) and it concepts. This will be achieved through of theoretical lectures in classes and projects in lab, there many assessment that increase the activities and understanding of students:</p> <ol style="list-style-type: none"> <li>1. There are a number of quizzes that assess the student's competency in end of each topic.</li> <li>2. There is a midterm class test.</li> <li>3. There are take-home mini-projects by a team of 2 students.</li> </ol> |

4. There are end-of-semester exam test.

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

|                                                                                |            |                                                                           |     |
|--------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 79         | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 5.2 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 96         | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6.4 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | <b>175</b> |                                                                           |     |

### Module Evaluation

تقييم المادة الدراسية

|                             |                     | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|-----------------------------|---------------------|-------------|------------------|----------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>      | 2           | 10% (10)         | 4 and 8  | LO #1- #10                |
|                             | <b>Lab.</b>         | 2           | 10% (10)         | 6 and 10 | LO #1- #10                |
|                             | <b>Projects</b>     | 1           | 10% (10)         | 6 and 14 | LO #1- #10                |
|                             | <b>Discuss.</b>     | 1           | 10% (10)         | 5 and 12 | LO #1- #10                |
| <b>Summative assessment</b> | <b>Midterm Exam</b> | 2hr         | 10% (10)         | 8        | LO #1 - #6                |
|                             | <b>Final Exam</b>   | 3hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>     |                     |             | 100% (100 Marks) |          |                           |

## Delivery Plan (Weekly Syllabus)

### المنهاج الاسبوعي النظري

|               | Material Covered                                                                                                                                                                                                         |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 1</b> | <p>Introduction to Object-oriented programming (OOP).</p> <ul style="list-style-type: none"> <li>- Overview of OOP.</li> <li>- Basics of OOP (class and object).</li> <li>- First program based OOP.</li> </ul>          |
| <b>Week 2</b> | <p>Attributes and Methods.</p> <ul style="list-style-type: none"> <li>- Instance variables, and methods.</li> <li>- Constructor in Python.</li> </ul>                                                                    |
| <b>Week 3</b> | <p>Attributes and Methods.</p> <ul style="list-style-type: none"> <li>- Instance variables, and methods.</li> <li>- Constructor in Python.</li> <li>- Keyword (self).</li> </ul>                                         |
| <b>Week 4</b> | <p>Attributes and Methods.</p> <ul style="list-style-type: none"> <li>- Instance variables, and methods.</li> <li>- Constructor in Python.</li> <li>- Keyword (self).</li> <li>- Class variables and methods.</li> </ul> |
| <b>Week 5</b> | Encapsulation (private, protected, public access modifiers)                                                                                                                                                              |
| <b>Week 6</b> | Encapsulation (private, protected, public access modifiers)                                                                                                                                                              |
| <b>Week 7</b> | Abstraction (Abstraction and why it is important).                                                                                                                                                                       |
| <b>Week 8</b> | Mid-term Exam                                                                                                                                                                                                            |
| <b>Week 9</b> | Inheritance (Basic inheritance examples).                                                                                                                                                                                |

|                |                                                                                                                                                                                                                |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 10</b> | Inheritance (Overriding methods).                                                                                                                                                                              |
| <b>Week 11</b> | Polymorphism <ul style="list-style-type: none"> <li>- What is polymorphism?</li> <li>- Polymorphism (functions and objects).</li> </ul>                                                                        |
| <b>Week 12</b> | Introduction to magic methods <ul style="list-style-type: none"> <li>- (<code>__str__</code>, <code>__len__</code>, <code>__repr__</code>,....)</li> <li>- Customizing behavior with magic methods.</li> </ul> |
| <b>Week 13</b> | Composition and Aggregation <ul style="list-style-type: none"> <li>- Difference between composition and inheritance.</li> <li>- Using composition to reuse code.</li> </ul>                                    |
| <b>Week 14</b> | OOP: Abstract Classes and Interfaces <ul style="list-style-type: none"> <li>- Abstract classes and methods.</li> <li>- Defining and using interface.</li> </ul>                                                |
| <b>Week 15</b> | OOP: Abstract Classes and Interfaces (Abstract base classes versus interface).                                                                                                                                 |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                                                   |
|-------------------------------------------------------------------------|-------------------------------------------------------------------|
|                                                                         | <b>Material Covered</b>                                           |
| <b>Week 1</b>                                                           | Python class, and object creation, class attributes, and methods. |
| <b>Week 2</b>                                                           | Implement class (and instance) with attributes and methods.       |
| <b>Week 3</b>                                                           | Implement class (constructor).                                    |
| <b>Week 4</b>                                                           | Class with (self), and variables, and methods.                    |
| <b>Week 5</b>                                                           | <b>1<sup>st</sup> Quiz</b>                                        |

|                |                                                                           |
|----------------|---------------------------------------------------------------------------|
| <b>Week 6</b>  | Excercises on Encapsulation (private, protected, public access modifiers) |
| <b>Week 7</b>  | Excercises on Encapsulation (private, protected, public access modifiers) |
| <b>Week 8</b>  | Implementing Abstraction using property.                                  |
| <b>Week 9</b>  | Basic examples in inheritance.                                            |
| <b>Week 10</b> | Inheritance and overriding.                                               |
| <b>Week 11</b> | <b>2<sup>nd</sup> Quiz</b>                                                |
| <b>Week 12</b> | Examples about polymorphisim.                                             |
| <b>Week 13</b> | Simple examples using magic methods.                                      |
| <b>Week 14</b> | Examples about composition.                                               |
| <b>Week 15</b> | Abstract and interface.                                                   |

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                                                                                                                                                                       |                                  |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                                                 | <b>Text</b>                                                                                                                                                                           | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                           | Python Object-Oriented Programming - Fourth Edition, Steven F. Lott, Dusty Phillips, 2021.                                                                                            | No                               |
| <b>Recommended Texts</b>                                        | <ul style="list-style-type: none"> <li>- Fluent Python, Luciano Ramalho, 2015.</li> <li>- "Object-Oriented Python: Master OOP by Building Games and GUIs", Irv Kalb, 2022.</li> </ul> | No                               |
| <b>Websites</b>                                                 |                                                                                                                                                                                       |                                  |

| <b>Grading Scheme</b><br>مخطط الدرجات |
|---------------------------------------|
|---------------------------------------|

| Group                              | Grade                   | التقدير             | Marks %  | Definition                            |
|------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| <b>Success Group</b><br>(50 - 100) | <b>A</b> – Excellent    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                    | <b>B</b> - Very Good    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                                    | <b>C</b> – Good         | جيد                 | 70 - 79  | Sound work with notable errors        |
|                                    | <b>D</b> - Satisfactory | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                                    | <b>E</b> – Sufficient   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)      | <b>FX</b> – Fail        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                    | <b>F</b> – Fail         | راسب                | (0-44)   | Considerable amount of work required  |
|                                    |                         |                     |          |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 3

### MODULE DESCRIPTION FORM

#### نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية |                    |                                                                                                                                                                                                      |
|-----------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Title                                  | Computation Theory | Module Delivery                                                                                                                                                                                      |
| Module Type                                   | Core               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical |
| Module Code                                   | CyB 203            |                                                                                                                                                                                                      |
| ECTS Credits                                  | 5                  |                                                                                                                                                                                                      |
| SWL (hr/sem)                                  | 125                |                                                                                                                                                                                                      |

|                                    |                     |                                  |        |
|------------------------------------|---------------------|----------------------------------|--------|
|                                    |                     | <input type="checkbox"/> Seminar |        |
| Module Level                       | 2                   | Semester of Delivery             | 1      |
| Administering Department           | CyB                 | College                          | CSIS   |
| Module Leader                      |                     | e-mail                           |        |
| Module Leader's Acad. Title        | Assist Proff        | Module Leader's Qualification    | PHD    |
| Module Tutor                       | Name (if available) | e-mail                           | E-mail |
| Peer Reviewer Name                 | Name                | e-mail                           | E-mail |
| Scientific Committee Approval Date |                     | Version Number                   | 1.0    |

|                                                                         |      |          |  |
|-------------------------------------------------------------------------|------|----------|--|
| <b>Relation with other Modules</b><br>العلاقة مع المواد الدراسية الأخرى |      |          |  |
| Prerequisite module                                                     | None | Semester |  |
| Co-requisites module                                                    |      | Semester |  |

|                                                                                                                           |                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                             |
| <b>Module Objectives</b><br>أهداف المادة الدراسية                                                                         | 29. Understand the abstract model of computation.<br>30. Understand the formal reasoning and the ability to build a base for solving problems.<br>31. The ability to understand the problems and find if they can solved using computation.<br>32. Understand the computation models, and their properties. |

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                   | <p>33. Learn the necessary mathematical techniques to prove the attributes of the computation models.</p> <p>34. The ability to express the problems mathematically and find the proof to solve them.</p> <p>35. Explore different (current and future) topics in the field of computation theory.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p>       | <p>11. Explain the basic concepts in computational theory through a set of tools.</p> <p>12. Acquiring skills in addressing the mathematical problems and proof the solution.</p> <p>13. Acquiring basic skills as an introduction to language construction.</p> <p>14. Acquiring theoretical concepts to deal with (RE's, DFA's, NFA's, Stack's, Turing machines, and Grammars).</p> <p>15. The ability to design (FAs, NFAs, Grammars, language modeling, small compilers basics).</p> <p>16. The ability to think about addressing the problem according to certain rules.</p> <p>17. The ability to distinguish between Natural and Formal Languages.</p> <p>18. The logical thinking to formulate the problems and solutions.</p> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p><b>Strategies</b></p>                                                          | <p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through:</p> <ul style="list-style-type: none"> <li>- Readings, self-learning, discussion panels.</li> <li>- Exercises and activities in the classroom.</li> <li>- Directing students to some websites to benefit from them to develop their capabilities.</li> </ul>                                                                                                                                                                                                                                |

|  |                                                                                                                                                                                       |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>- Holding research seminars through which some problems are explained and analyzed and the mechanism for finding solutions to them.</li> </ul> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا

|                                                                                |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       | 62  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       | 4.1 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 63  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 4.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | 125 |                                                                           |     |

### Module Evaluation

تقييم المادة الدراسية

|                             |                        | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|-----------------------------|------------------------|-------------|------------------|----------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>         | 2           | 10% (10)         | 5 and 10 | All                       |
|                             | <b>Assignments</b>     | 2           | 20% (20)         | 2 and 12 | LO #2, #4 and #5, #8      |
|                             | <b>Projects / Lab.</b> | -           | -                | -        | -                         |
|                             | <b>Report</b>          | 1           | 10% (10)         | 13       | LO #1, #3, #6 and #7      |
| <b>Summative assessment</b> | <b>Midterm Exam</b>    | 2hr         | 10% (10)         | 7        | All                       |
|                             | <b>Final Exam</b>      | 3hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>     |                        |             | 100% (100 Marks) |          |                           |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

|                | Material Covered                                                                                   |
|----------------|----------------------------------------------------------------------------------------------------|
| <b>Week 1</b>  | Introduction to languages ( set,string,alphabets, language).                                       |
| <b>Week 2</b>  | Introduction to FAs (Finite state automata).                                                       |
| <b>Week 3</b>  | FAs (Types of NFAs,DFAs and equivalence between NFAs and DFAs, FAs with epsilon move).             |
| <b>Week 4</b>  | Introduction to Regular Expressions.                                                               |
| <b>Week 5</b>  | Regular Expressions (Pumping lemma on regular languages, closure properties of regular languages). |
| <b>Week 6</b>  | FAs with outputs (Finite State Automata with output(Mealy and Moore) Machine).                     |
| <b>Week 7</b>  | FAs with outputs (Equivalence between Moore and Mealy Machine).                                    |
| <b>Week 8</b>  | Represent REs, FAs, TGs (leens Theorem)                                                            |
| <b>Week 9</b>  | Introduction to CFGs (Context Free Grammar and Languages)                                          |
| <b>Week 10</b> | CFGs (Context Free Grammar without empty string).                                                  |
| <b>Week 11</b> | CFGs (Derivation Tree (LMD,RMD), Simplification of CFGs).                                          |
| <b>Week 12</b> | CFGs (Chomsky and Greibach normal form).                                                           |
| <b>Week 13</b> | CFGs (The ambiguous CFGs).                                                                         |
| <b>Week 14</b> | Pushdown automata and CFL, closure properties of CFL(union,concatenation,kleen closure)            |
| <b>Week 15</b> | Turing Machine                                                                                     |
| <b>Week 16</b> | <b>Exam</b>                                                                                        |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                                                                           | Available in the Library? |
|-------------------|--------------------------------------------------------------------------------|---------------------------|
| Required Texts    | Introduction to the Theory of Computation (3rd Edition), by Michael Sipser.    | No                        |
| Recommended Texts | An Introduction to Formal Languages and Automata (6th Edition), by Peter Linz. | No                        |
| Websites          |                                                                                |                           |

| Grading Scheme                                                                                                                                                                                                                                                                                                                                                                              |                  |                     |          |                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|----------|---------------------------------------|
| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                                                |                  |                     |          |                                       |
| Group                                                                                                                                                                                                                                                                                                                                                                                       | Grade            | التقدير             | Marks %  | Definition                            |
| Success Group<br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                                 | A – Excellent    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                             | B - Very Good    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | C – Good         | جيد                 | 70 - 79  | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | D - Satisfactory | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                             | E – Sufficient   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                                      | FX – Fail        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                             | F – Fail         | راسب                | (0-44)   | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                  |                     |          |                                       |
| <p><b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.</p> |                  |                     |          |                                       |

## Module 4

### MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

| Module Information                 |                           |                               |                                                                                                                                                                                                                                                                |  |
|------------------------------------|---------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية            |                           |                               |                                                                                                                                                                                                                                                                |  |
| Module Title                       | <b>Database Principle</b> |                               | Module Delivery                                                                                                                                                                                                                                                |  |
| Module Type                        | Core                      |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |
| Module Code                        | CyB 204                   |                               |                                                                                                                                                                                                                                                                |  |
| ECTS Credits                       | 6                         |                               |                                                                                                                                                                                                                                                                |  |
| SWL (hr/sem)                       | 150                       |                               |                                                                                                                                                                                                                                                                |  |
| Module Level                       | 2                         | Semester of Delivery          | 1                                                                                                                                                                                                                                                              |  |
| Administering Department           | CyB                       | College                       | CSIS                                                                                                                                                                                                                                                           |  |
| Module Leader                      |                           | e-mail                        |                                                                                                                                                                                                                                                                |  |
| Module Leader's Acad. Title        | Assist Proff              | Module Leader's Qualification | PHD                                                                                                                                                                                                                                                            |  |
| Module Tutor                       | Name (if available)       | e-mail                        | E-mail                                                                                                                                                                                                                                                         |  |
| Peer Reviewer Name                 | Name                      | e-mail                        | E-mail                                                                                                                                                                                                                                                         |  |
| Scientific Committee Approval Date | /0/2023                   | Version Number                | 1.0                                                                                                                                                                                                                                                            |  |

| Relation with other Modules       |      |          |  |
|-----------------------------------|------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |      |          |  |
| Prerequisite module               | None | Semester |  |
| Co-requisites module              |      | Semester |  |

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>                | <ol style="list-style-type: none"> <li>1. Understand the structure of Database and database users.</li> <li>2. Learning the Database concepts and database architecture.</li> <li>3. The ability to implement data modeling with ER model,</li> <li>4. Understand the relational model, database language and management systems.</li> <li>5. Learn the relational data model, constraints (integrity), and relational algebra.</li> <li>6. Learn the basics of SQL language.</li> <li>7. Understand the database design, theory and methodology.</li> <li>8. Learn different concepts such as (functional dependencies and normalization, relational database design algorithm).</li> </ol>                    |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>1. Describe database concepts and architecture including query processing and optimization, concurrency controls and database recovery.</li> <li>2. Identify database requirements and constraints to solve a business problem.</li> <li>3. Design logical and mathematical models to organize data within a database.</li> <li>4. Develop databases and execute queries using SQL.</li> <li>5. Analyze functional dependencies and apply normalization rules to minimize redundancy.</li> <li>6. Develop skills to work in a group project to produce quality deliverables.</li> <li>7. Develop skills to structure themselves to work in a cohesive manner.</li> </ol> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <ul style="list-style-type: none"> <li>• Introduction to Databases</li> <li>• Conceptual Database Design</li> <li>• Entity Relationship Diagram</li> <li>• Enhanced ER (EER) Model Concepts (ERD)</li> <li>• Relational Data Model and Relational Database Constraints</li> <li>• Relational Algebra</li> <li>• Normalization</li> <li>• Structured Query Language (SQL)</li> <li>• Advanced SQL</li> <li>• File Structure and Indexes</li> <li>• Database Performance Issues</li> </ul>                                                                                                                                                                                                                        |

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                              |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and the lab, interactive tutorials, and by considering types of projects, reports, quizzes and presentations. |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Student Workload (SWL)

### الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

|                                                                                |     |                                                                           |      |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|------|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 77  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 5.13 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 73  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4.68 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 150 |                                                                           |      |

## Module Evaluation

### تقييم المادة الدراسية

|                             |                        | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|-----------------------------|------------------------|-------------|----------------|----------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>         | 2           | 20% (20)       | 4 and 12 | LO #1- #4 and #7          |
|                             | <b>Assignments</b>     | 2           | 10% (10)       | 6 and 12 | LO #4, and #5             |
|                             | <b>Projects / Lab.</b> | 1           | 10% (10)       | 14       | LO #1- #7                 |
|                             | <b>Report</b>          | -           | -              | -        | -                         |

|                      |              |     |                  |    |            |
|----------------------|--------------|-----|------------------|----|------------|
| Summative assessment | Midterm Exam | 2hr | 10% (10)         | 9  | LO #1 - #7 |
|                      | Final Exam   | 3hr | 50% (50)         | 16 | All        |
| Total assessment     |              |     | 100% (100 Marks) |    |            |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                                           |
|-------------------------------------------------------------------|-----------------------------------------------------------|
|                                                                   | Material Covered                                          |
| <b>Week 1</b>                                                     | Introduction to Databases                                 |
| <b>Week 2</b>                                                     | Conceptual Database Design                                |
| <b>Week 3</b>                                                     | Entity Relationship Diagram (ERD)                         |
| <b>Week 4</b>                                                     | Enhanced ER (EER) Model Concepts                          |
| <b>Week 5</b>                                                     | Relational Data Model and Relational Database Constraints |
| <b>Week 6</b>                                                     | Relational Algebra-- <b>1<sup>st</sup> Assignment</b>     |
| <b>Week 7</b>                                                     | Structured Query Language (SQL)                           |
| <b>Week 8</b>                                                     | Advanced SQL                                              |
| <b>Week 9</b>                                                     | <b>Midterm Exam</b>                                       |
| <b>Week 10</b>                                                    | Normalization                                             |
| <b>Week 11</b>                                                    | File Structure and Indexes                                |
| <b>Week 12</b>                                                    | Database Performance Issues -                             |
| <b>Week 13</b>                                                    | <b>2<sup>nd</sup> Assignment</b>                          |
| <b>Week 14</b>                                                    | <b>Mini-project evaluation</b>                            |

|                |                                                                                                  |
|----------------|--------------------------------------------------------------------------------------------------|
| <b>Week 15</b> | Review and Exam Preparation: a review of key topics and concepts, exam practice, and preparation |
| <b>Week 16</b> | <b>Final Exam</b>                                                                                |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                                   |
|-------------------------------------------------------------------------|-----------------------------------|
|                                                                         | <b>Material Covered</b>           |
| <b>Week 1</b>                                                           | Introduction to MS-Access         |
| <b>Week 2</b>                                                           | Tables Design                     |
| <b>Week 3</b>                                                           | Tables Relationships              |
| <b>Week 4</b>                                                           | Forms                             |
| <b>Week 5</b>                                                           | <b>1<sup>st</sup> Quiz</b>        |
| <b>Week 6</b>                                                           | Queries1                          |
| <b>Week 7</b>                                                           | Queries2                          |
| <b>Week 8</b>                                                           | Mini-Project Projects Evaluation  |
| <b>Week 9</b>                                                           | Reports                           |
| <b>Week 10</b>                                                          | <b>2<sup>nd</sup> Quiz</b>        |
| <b>Week 11</b>                                                          | Switchboard and user interface    |
| <b>Week 12</b>                                                          | Macro's and VBA                   |
| <b>Week 13</b>                                                          | Finalizing Database System        |
| <b>Week 14</b>                                                          | Final-Project Projects Evaluation |
| <b>Week 15</b>                                                          |                                   |
|                                                                         |                                   |

## Learning and Teaching Resources

### مصادر التعلم والتدريس

|                          | Text                                                                                                                                                                                                                                                                                                                                                                                            | Available in the Library? |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | <p>[1] Kroenke, David, and David J. Auer. Database concepts. Prentice Hall, 2013.</p> <p>[2] Silberschatz, Abraham, Henry F. Korth, and S. Sudarshan. Database system concepts. 4th edition. Hightstown: McGraw-Hill, 2002 ISBN 0-07-255481-9.</p> <p>[3] Elmasri, Ramez., Fundamentals of database systems / Ramez Elmasri, Shamkant B. Navathe.—6th ed.,p. cm. ISBN-13: 978-0-136-08620-8</p> | No                        |
| <b>Recommended Texts</b> | Bagui, S. & Earp, R (2004). Learning SQL A Step-by-Step Guide Using Access®. Addison-Wesley Publishing. ISBN: 0-32-111904-5.                                                                                                                                                                                                                                                                    | No                        |
| <b>Websites</b>          |                                                                                                                                                                                                                                                                                                                                                                                                 |                           |

## Grading Scheme

### مخطط الدرجات

| Group                               | Grade                   | التقدير | Marks %  | Definition                       |
|-------------------------------------|-------------------------|---------|----------|----------------------------------|
| <b>Success Group<br/>(50 - 100)</b> | <b>A – Excellent</b>    | امتياز  | 90 - 100 | Outstanding Performance          |
|                                     | <b>B - Very Good</b>    | جيد جدا | 80 - 89  | Above average with some errors   |
|                                     | <b>C – Good</b>         | جيد     | 70 - 79  | Sound work with notable errors   |
|                                     | <b>D - Satisfactory</b> | متوسط   | 60 - 69  | Fair but with major shortcomings |
|                                     | <b>E – Sufficient</b>   | مقبول   | 50 - 59  | Work meets minimum criteria      |

|                   |                  |                     |         |                                       |
|-------------------|------------------|---------------------|---------|---------------------------------------|
| <b>Fail Group</b> | <b>FX – Fail</b> | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| <b>(0 – 49)</b>   | <b>F – Fail</b>  | راسب                | (0-44)  | Considerable amount of work required  |
|                   |                  |                     |         |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 5

### MODULE DESCRIPTION FORM

#### نموذج وصف المادة الدراسية

|                                                                     |                                        |
|---------------------------------------------------------------------|----------------------------------------|
| 1. Course Name:                                                     |                                        |
| Static Websites Programming                                         |                                        |
| 2. Course Code:                                                     |                                        |
| CyB 205                                                             |                                        |
| 3. Semester / Year:                                                 |                                        |
| 2 <sup>ND</sup> year                                                |                                        |
| 4. Description Preparation Date:                                    |                                        |
| 10/9/2025                                                           |                                        |
| 5. Available Attendance Forms:                                      |                                        |
| Daily Attendance Sheet                                              |                                        |
| 6. Number of Credit Hours (Total) / Number of Units (Total):15      |                                        |
|                                                                     |                                        |
| 7. Course administrator's name (mention all, if more than one name) |                                        |
| Name: Lamia Ali Abdulzahra<br>Email:lamia.ali@uobasrah.edu.iq       |                                        |
| 8. Email: Course Objectives                                         |                                        |
| <b>Course Objectives</b>                                            | The objectives of this program are to: |

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            | <ul style="list-style-type: none"> <li>• <b>Build Foundational Web Development Skills</b> <ul style="list-style-type: none"> <li>○ Provide students with a strong understanding of HTML, CSS, and JavaScript as the core building blocks of modern web development.</li> </ul> </li> <li>• <b>Enable Practical Application</b> <ul style="list-style-type: none"> <li>○ Equip students to design, develop, and publish functional, interactive, and visually appealing websites.</li> </ul> </li> <li>• <b>Promote Best Practices</b> <ul style="list-style-type: none"> <li>○ Develop awareness of web standards, accessibility guidelines, responsive design principles, and coding conventions.</li> </ul> </li> <li>• <b>Foster Problem-Solving and Creativity</b> <ul style="list-style-type: none"> <li>○ Encourage students to apply logical thinking and creativity in solving design and programming challenges.</li> </ul> </li> <li>• <b>Prepare for Advanced Learning and Careers</b> <ul style="list-style-type: none"> <li>○ Lay the groundwork for advanced courses in web technologies, software development, and related fields.</li> <li>○ Provide transferable skills relevant to the professional world, such as teamwork, critical thinking, and digital literacy.</li> </ul> </li> </ul> |
| <b>9. Teaching and Learning Strategies</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Strategy</b>                            | <p>The <i>Web Programming I</i> course adopts a variety of teaching and learning strategies to ensure students develop both theoretical understanding and practical skills:</p> <ol style="list-style-type: none"> <li>1. <b>Lectures (Theory Delivery)</b> <ul style="list-style-type: none"> <li>○ Provide foundational knowledge of HTML, CSS, and JavaScript.</li> <li>○ Use multimedia presentations and live coding demonstrations.</li> </ul> </li> <li>2. <b>Hands-On Laboratory Sessions</b> <ul style="list-style-type: none"> <li>○ Conduct practical exercises in computer labs to apply lecture concepts.</li> <li>○ Guide students through coding tasks, debugging, and small projects.</li> </ul> </li> <li>3. <b>Project-Based Learning (PBL)</b> <ul style="list-style-type: none"> <li>○ Assign individual and group projects (e.g., building a personal portfolio site).</li> <li>○ Encourage creativity, problem-solving, and application of best practices.</li> </ul> </li> </ol>                                                                                                                                                                                                                                                                                                        |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p><b>4. Active and Collaborative Learning</b></p> <ul style="list-style-type: none"> <li>○ Use pair programming, group discussions, and peer code reviews.</li> <li>○ Encourage teamwork and knowledge sharing.</li> </ul> <p><b>5. E-Learning and Online Resources</b></p> <ul style="list-style-type: none"> <li>○ Integrate Learning Management Systems (LMS) for assignments, quizzes, and resources.</li> <li>○ Provide supplementary tutorials, coding sandboxes (e.g., CodePen, JSFiddle), and video lessons.</li> </ul> <p><b>6. Formative Assessments and Feedback</b></p> <ul style="list-style-type: none"> <li>○ Use short quizzes, coding exercises, and in-class activities for continuous evaluation.</li> <li>○ Provide timely feedback to help students improve progressively.</li> </ul> <p><b>7. Self-Directed Learning</b></p> <ul style="list-style-type: none"> <li>○ Encourage students to explore web development tools, online documentation, and communities.</li> <li>○ Promote independent problem-solving and lifelong learning habits.</li> </ul> <p><b>8. Demonstrations and Case Studies</b></p> <ul style="list-style-type: none"> <li>○ Showcase real-world websites and applications to highlight best practices.</li> <li>○ Analyze case studies of good vs. poor web design and coding practices.</li> </ul> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 10. Course Structure

| Week | Hours | Required Learning Outcomes                            | Unit or subject name                                | Learning method      | Evaluation method    |
|------|-------|-------------------------------------------------------|-----------------------------------------------------|----------------------|----------------------|
| 1    | 3     | Understand course overview and web development basics | Introduction to Web Programming & Internet Concepts | Lecture + Discussion | Participation        |
| 2    | 3     | Describe HTML structure and basic tags                | HTML Basics: Elements, Headings, Paragraphs, Links  | Lecture + Lab        | Quiz + Lab exercises |

|   |   |                                                            |                                                     |                        |                            |
|---|---|------------------------------------------------------------|-----------------------------------------------------|------------------------|----------------------------|
| 3 | 3 | Create structured web pages with lists, images, and tables | HTML Lists, Images, Tables                          | Lecture + Lab          | Lab exercises              |
| 4 | 3 | Implement forms and input controls                         | HTML Forms and Input Elements                       | Lecture + Lab          | Lab exercises + Quiz       |
| 5 | 3 | Apply CSS styling to HTML elements                         | CSS Basics: Selectors, Properties, Colors           | Lecture + Lab          | Lab exercises              |
| 6 | 3 | Design page layout using CSS                               | CSS Box Model, Margins, Padding, Borders            | Lecture + Lab          | Lab exercises              |
| 7 | 3 | Implement advanced CSS styling and positioning             | CSS Positioning, Flexbox, Grid                      | Lecture + Lab          | Lab exercises + Quiz       |
| 8 | 3 | Apply learned concepts in a small project                  | Midterm Project: Simple Web Page                    | Project-Based Learning | Midterm Project Evaluation |
| 9 | 3 | Add interactivity with JavaScript                          | JavaScript Basics: Variables, Data Types, Operators | Lecture + Lab          | Lab exercises              |

|                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |                                                       |                                               |                           |                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------------------------------------------------|-----------------------------------------------|---------------------------|------------------------------------------|
| 10                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3 | Control program flow using conditions and loops       | JavaScript: Conditionals & Loops              | Lecture + Lab             | Lab exercises                            |
| 11                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3 | Manipulate web page elements dynamically              | JavaScript DOM Manipulation                   | Lecture + Lab             | Lab exercises                            |
| 12                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3 | Handle events and validate forms                      | JavaScript Events & Form Validation           | Lecture + Lab             | Lab exercises + Quiz                     |
| 13                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3 | Apply functions and arrays in JavaScript              | JavaScript Functions & Arrays                 | Lecture + Lab             | Lab exercises                            |
| 14                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3 | Integrate HTML, CSS, and JavaScript in a full project | Capstone Project Development                  | Project-Based Learning    | Project Progress Evaluation              |
| 15                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3 | Present final projects and review all topics          | Capstone Project Presentation & Course Review | Presentation + Discussion | Final Project Evaluation + Participation |
| 11. Course Evaluation                                                                                                                                                                                                                                                                                                                                                                                                                         |   |                                                       |                                               |                           |                                          |
| <ul style="list-style-type: none"> <li>• Continuous Assessment: Quizzes and lab exercises are conducted weekly to provide timely feedback and track progress.</li> <li>• Project-Based Assessment: Both midterm and final projects assess students' ability to integrate theory into practical web development tasks.</li> <li>• Participation: Students are encouraged to actively engage in labs, discussions, and peer reviews.</li> </ul> |   |                                                       |                                               |                           |                                          |

|                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Flexibility: Evaluation methods may be adjusted to suit online or blended learning environments, ensuring fairness and accessibility.</li> </ul> |                                                                                                                                                                                                                                                                                                       |
| 12. Learning and Teaching Resources                                                                                                                                                     |                                                                                                                                                                                                                                                                                                       |
| Required textbooks (curricular books, if any)                                                                                                                                           |                                                                                                                                                                                                                                                                                                       |
| Main references (sources)                                                                                                                                                               | <p><b>"JavaScript for Modern Web Development: Building a Web Application Using HTML, CSS, and JavaScript"</b><br/> <i>Publisher:</i> Skillsoft, 2020<br/> <i>Overview:</i> Complete guide for learning web development from basics to building a web application using HTML, CSS, and JavaScript.</p> |
| Recommended books and references (scientific journals, reports...)                                                                                                                      | <p><b>"JavaScript: The Definitive Guide, 7th Edition"</b><br/> <i>Author:</i> David Flanagan<br/> <i>Publisher:</i> O'Reilly Media, 2020<br/> <i>Overview:</i> Complete reference for JavaScript covering the latest features and best practice</p>                                                   |
| Electronic References, Websites                                                                                                                                                         | <p><b>W3Schools</b><br/> <i>Description:</i> Educational website with interactive tutorials and examples for HTML, CSS, and JavaScript.<br/> <i>Link:</i> W3Schools</p>                                                                                                                               |

## Module 6

### MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية |                    |                                                                                                                                                                                                      |
|-----------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Title                                  | Arabic Language II | Module Delivery                                                                                                                                                                                      |
| Module Type                                   | Support            | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical |
| Module Code                                   | UOB204             |                                                                                                                                                                                                      |
| ECTS Credits                                  | 2                  |                                                                                                                                                                                                      |

|                                    |                     |                                  |  |
|------------------------------------|---------------------|----------------------------------|--|
| SWL (hr/sem)                       | 50                  | <input type="checkbox"/> Seminar |  |
| Module Level                       |                     | Semester of Delivery             |  |
| Administering Department           |                     | College                          |  |
| Module Leader                      | م.م. هديل سالم كاطع | e-mail                           |  |
| Module Leader's Acad. Title        |                     | Module Leader's Qualification    |  |
| Module Tutor                       |                     | e-mail                           |  |
| Peer Reviewer Name                 |                     | e-mail                           |  |
| Scientific Committee Approval Date |                     | Version Number                   |  |

| Relation with other Modules       |                                                                                                                                           |          |  |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |                                                                                                                                           |          |  |
| Prerequisite module               | توضح هذه المادة للطالب أساسيات اللغة العربية والتعرف أيضاً على أهم ادباء العرب ، إضافة إلى بيان أهمية اللغة العربية كونها لغتنا الأساسية. | Semester |  |
| Co-requisites module              | None                                                                                                                                      | Semester |  |

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                |
| Module Objectives<br>أهداف المادة الدراسية               | إكساب الطلبة المعارف و المعلومات المناسبة في اللغة العربية وآدابها، وتنمية الذائقة اللغوية و الأدبية لدى الطلبة على مايسمعون أو يقرؤون وكذلك تعزيز مهارات البحث العلمي في مجالات اللغة و الأدب، إضافة إلى إكساب الطلاب مهارات التعبير بالفصحى ، وتنمية الاتجاهات والقيم الإيجابية لدى الطلاب نحو لغتهم العربية المرتبطة بالدين والتراث العربي. |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | مخرجات التعلم لمادة اللغة العربية تهدف إلى تطوير مجموعة من المهارات و المعرفة لدى الطلاب، ادناه بعض مخرجات التعلم الرئيسية بعد انتهاء دراسة هذه المادة:<br>1-شرح القواعد الأساسية للكتابة في مادة اللغة العربية.<br>2-تطبيق المعارف اللغوية بمهارة ويسر<br>3-تحليل التراكيب اللغوية والنصوص البسيطة التي يستعملها في حياته اليومية<br>4-معالجة الأخطاء البسيطة لديه |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | 1-نشر اللغة العربية بين أفراد المجتمع عموماً لفتح آفاق جديدة لتطوير المهارات اللغوية و دعهما.<br>2-التحديات المختلفة التي تواجه المجتمع على صعيد التربية والتعليم و لاسيما في مجال تدريس اللغة العربية.<br>3-الإفادة من وسائل الاتصال الحديثة كالانترنت و غيرها في عملية التعلم.                                                                                    |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                    |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | 1-لقاء المحاضرات بشكل تفصيلي.<br>2-كتابة التقارير.<br>3-مناقشة يومية لمعرفة مدى استيعاب الطلبة للمادة ووضع تقييم للمشاركات اليومية.<br>4-امتحانات يومية (كوزات) و امتحانات شهرية للمنهج الدراسي والامتحان النهائي. |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا       |  |                                                                           |  |
|--------------------------------------------------------------------------------|--|---------------------------------------------------------------------------|--|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       |  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       |  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل |  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا |  |

|                                                                   |  |
|-------------------------------------------------------------------|--|
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل |  |
|-------------------------------------------------------------------|--|

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                     |             |                  |          |                           |
|---------------------------------------------------|---------------------|-------------|------------------|----------|---------------------------|
|                                                   |                     | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | <b>Quizzes</b>      | 2           | 15% (15)         | 5 and 10 | LO #1, #2 and #10         |
|                                                   | <b>Assignments</b>  | 2           | 10% (10)         | 2 and 12 | LO #3, #4 and #6, #7      |
|                                                   | <b>Report</b>       | 1           | 15% (15)         | 13       | LO #5, #8 and #10         |
| <b>Summative assessment</b>                       | <b>Midterm Exam</b> | 2hr         | 10% (10)         | 7        | LO #1 - #7                |
|                                                   | <b>Final Exam</b>   | 3hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>                           |                     |             | 100% (100 Marks) |          |                           |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                     |
|-------------------------------------------------------------------|---------------------|
|                                                                   | Material Covered    |
| <b>Week 1</b>                                                     | مفهوم اللغة         |
| <b>Week 2</b>                                                     | أهمية اللغة ونشأتها |
| <b>Week 3</b>                                                     | المصطلح العلمي 1    |
| <b>Week 4</b>                                                     | المصطلح العلمي 2    |
| <b>Week 5</b>                                                     | المعاجم 1           |

|         |                  |
|---------|------------------|
| Week 6  | المعاجم 2        |
| Week 7  | عصر النهضة       |
| Week 8  | رواد عصر النهضة  |
| Week 9  | ادب عصر النهضة   |
| Week 10 | الاستشراق        |
| Week 11 | نقد الاستشراق    |
| Week 12 | ادب الاستشراق    |
| Week 13 | تقارير           |
| Week 14 | كوز              |
| Week 15 | الامتحان النهائي |
| Week 16 |                  |

| Delivery Plan (Weekly Lab. Syllabus) |                  |
|--------------------------------------|------------------|
| المنهاج الاسبوعي للمختبر             |                  |
|                                      | Material Covered |
| Week 1                               |                  |
| Week 2                               |                  |
| Week 3                               |                  |
| Week 4                               |                  |
| Week 5                               |                  |
| Week 6                               |                  |
| Week 7                               |                  |

## Learning and Teaching Resources

### مصادر التعلم والتدريس

|                   | Text                                            | Available in the Library? |
|-------------------|-------------------------------------------------|---------------------------|
| Required Texts    | شرح ابن عقيل، ديوان المتنبي، تاريخ الادب العربي |                           |
| Recommended Texts |                                                 |                           |
| Websites          |                                                 |                           |

## Grading Scheme

### مخطط الدرجات

| Group                              | Grade                   | التقدير             | Marks %  | Definition                            |
|------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| <b>Success Group</b><br>(50 - 100) | <b>A</b> - Excellent    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                    | <b>B</b> - Very Good    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                                    | <b>C</b> - Good         | جيد                 | 70 - 79  | Sound work with notable errors        |
|                                    | <b>D</b> - Satisfactory | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                                    | <b>E</b> - Sufficient   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)      | <b>FX</b> – Fail        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                    | <b>F</b> – Fail         | راسب                | (0-44)   | Considerable amount of work required  |
|                                    |                         |                     |          |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Curriculum for the second Year, Second Semester.

### Module 1

#### MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

| Module Information                 |                                       |                               |                                                                                                                                                                                                                                                     |   |
|------------------------------------|---------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| معلومات المادة الدراسية            |                                       |                               |                                                                                                                                                                                                                                                     |   |
| Module Title                       | <b>Object Oriented Programming II</b> |                               | Module Delivery                                                                                                                                                                                                                                     |   |
| Module Type                        | Core                                  |                               | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input checked="" type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |   |
| Module Code                        | CyB206                                |                               |                                                                                                                                                                                                                                                     |   |
| ECTS Credits                       | 7                                     |                               |                                                                                                                                                                                                                                                     |   |
| SWL (hr/sem)                       | 175                                   |                               |                                                                                                                                                                                                                                                     |   |
| Module Level                       | 2                                     | Semester of Delivery          |                                                                                                                                                                                                                                                     | 2 |
| Administering Department           | CyB                                   | College                       | CSIT                                                                                                                                                                                                                                                |   |
| Module Leader                      |                                       |                               | E-mail                                                                                                                                                                                                                                              |   |
| Module Leader's Acad. Title        | Assist Prof                           | Module Leader's Qualification | PhD                                                                                                                                                                                                                                                 |   |
| Module Tutor                       | Name (if available)                   | E-mail                        | E-mail                                                                                                                                                                                                                                              |   |
| Peer Reviewer Name                 | Name                                  | E-mail                        | E-mail                                                                                                                                                                                                                                              |   |
| Scientific Committee Approval Date | 16/2/2025                             | Version Number                | 1.0                                                                                                                                                                                                                                                 |   |

| Relation with other Modules       |                               |  |          |   |
|-----------------------------------|-------------------------------|--|----------|---|
| العلاقة مع المواد الدراسية الأخرى |                               |  |          |   |
| Prerequisite Module               | Object-Oriented Programming I |  | Semester | 1 |

|                      |  |          |  |
|----------------------|--|----------|--|
| Co-requisites Module |  | Semester |  |
|----------------------|--|----------|--|

| Module Aims, Learning Outcomes and Indicative Contents           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Module Objectives</b><br>أهداف المادة الدراسية                | 1. Understand advanced Object-Oriented Programming (OOP) concepts and techniques.<br>2. Develop efficient and modular Python programs using OOP principles.<br>3. Apply OOP in real-world applications, including GUI and file handling.<br>4. Enhance problem-solving skills using Python's OOP capabilities.                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | 1. Explain the principles of Object-Oriented Programming.<br>2. Implement classes, objects, attributes, and methods in Python.<br>3. Utilize inline functions (lambda) inside classes.<br>4. Work with arrays of objects and pointers to objects.<br>5. Apply friend functions in Python.<br>6. Overload operators using member functions.<br>7. Implement various inheritance types, including multiple, multilevel, hierarchical, and hybrid inheritance.<br>8. Use method overriding for polymorphism.<br>9. Demonstrate composition and aggregation in class relationships.<br>10. Perform file handling operations in Python.<br>11. Develop GUI applications using Tkinter. |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | 1. Review of OOP concepts.<br>2. Creating inline functions inside a class (lambda functions).<br>3. Working with arrays of objects and pointers to objects.<br>4. Friend functions in Python.<br>5. Advanced operator overloading techniques.<br>6. Implementation of various types of inheritance.<br>7. Method overriding for polymorphism.<br>8. Composition and aggregation in OOP.<br>9. File handling in Python.<br>10. GUI programming using Tkinter.                                                                                                                                                                                                                      |

| Learning and Teaching Strategies |                                                                                                                                                                                                                                                                         |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| استراتيجيات التعلم والتعليم      |                                                                                                                                                                                                                                                                         |
| <b>Strategies</b>                | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and the lab, interactive |

|  |                                                                                                                                    |
|--|------------------------------------------------------------------------------------------------------------------------------------|
|  | tutorials, and by considering types of simple experiments involving some sampling activities that are interesting to the students. |
|--|------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                         |     |                                                                           |  |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|--|
| الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا                                        |     |                                                                           |  |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 77  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       |  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 98  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا |  |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 175 |                                                                           |  |

| Module Evaluation     |                       |             |                  |            |                           |
|-----------------------|-----------------------|-------------|------------------|------------|---------------------------|
| تقييم المادة الدراسية |                       |             |                  |            |                           |
|                       |                       | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
| Formative Assessment  | Quizzes (Theoretical) | 2           | 10% (10)         | 5 and 10   | LO #1, #2 and #10, #11    |
|                       | Participation         | 1           | 10% (10)         | 2 and 12   | LO #3, #4 and #6, #7      |
|                       | Quizzes (Lab)         | 2           | 10% (10)         | Continuous | All                       |
|                       | Project               | 1           | 10% (10)         | 13         | LO #5, #8 and #10         |
| Summative Assessment  | Midterm Exam          | 1hr         | 10% (10)         | 7          | LO #1 - #7                |
|                       | Final Exam            | 3hr         | 50% (50)         | 16         | All                       |
| Total Assessment      |                       |             | 100% (100 Marks) |            |                           |

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

|                | Material Covered                                           |
|----------------|------------------------------------------------------------|
| <b>Week 1</b>  | Review of OOP Concepts: Introduction to Class Fundamentals |
| <b>Week 2</b>  | Creating Inline Functions Inside a Class (Lambda)          |
| <b>Week 3</b>  | Arrays of Objects (Classes)                                |
| <b>Week 4</b>  | Pointers to Objects (Classes)                              |
| <b>Week 5</b>  | Friend Functions                                           |
| <b>Week 6</b>  | Operator Overloading (advanced)                            |
| <b>Week 7</b>  | Operator Overloading Using Member Functions (advanced)     |
| <b>Week 8</b>  | Mid-term Exam                                              |
| <b>Week 9</b>  | Inheriting Multiple Base Classes                           |
| <b>Week 10</b> | Method Overriding in Python Inheritance                    |
| <b>Week 11</b> | Multilevel Inheritance                                     |
| <b>Week 12</b> | Hierarchal and Hybrid Inheritance                          |
| <b>Week 13</b> | Composition and Aggregation                                |
| <b>Week 14</b> | File handling                                              |
| <b>Week 15</b> | Introduction to Tkinter                                    |
| <b>Week 16</b> | Exam                                                       |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|                | Material Covered                                                    |
|----------------|---------------------------------------------------------------------|
| <b>Week 1</b>  | Implement class (and instance) with attributes and methods.         |
| <b>Week 2</b>  | Exercises on creating Inline Functions Inside a Class (Lambda).     |
| <b>Week 3</b>  | Implementing examples by using Arrays of Objects (Classes)          |
| <b>Week 4</b>  | Implementing examples on Pointers to Objects (Classes)              |
| <b>Week 5</b>  | Exercises on Friend Functions                                       |
| <b>Week 6</b>  | Implementing examples Operator Overloading (advanced)               |
| <b>Week 7</b>  | Exercises on Operator Overloading Using Member Functions (advanced) |
| <b>Week 8</b>  | <b>1<sup>st</sup> Quiz</b>                                          |
| <b>Week 9</b>  | Implementing examples of Inheriting Multiple Base Classes           |
| <b>Week 10</b> | Implementing examples of method Overriding in Python Inheritance    |
| <b>Week 11</b> | Implementing exercises on Multilevel Inheritance                    |
| <b>Week 12</b> | Implementing hierarchal and Hybrid Inheritance                      |
| <b>Week 13</b> | Exercises in Composition and Aggregation                            |
| <b>Week 14</b> | <b>2<sup>st</sup> Quiz</b>                                          |
| <b>Week 15</b> | Implementing File handling                                          |
| <b>Week 16</b> | Implementing examples on Tkinter                                    |

| Learning and Teaching Resources |                                                                                            |                           |
|---------------------------------|--------------------------------------------------------------------------------------------|---------------------------|
| مصادر التعلم والتدريس           |                                                                                            |                           |
|                                 | Text                                                                                       | Available in the Library? |
| <b>Required Texts</b>           | Python Object-Oriented Programming - Fourth Edition, Steven F. Lott, Dusty Phillips, 2021. | No                        |

|                          |                                                                                                                                                                                       |           |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Recommended Texts</b> | <ul style="list-style-type: none"> <li>- Fluent Python, Luciano Ramalho, 2015.</li> <li>- "Object-Oriented Python: Master OOP by Building Games and GUIs", Irv Kalb, 2022.</li> </ul> | <b>No</b> |
| <b>Websites</b>          |                                                                                                                                                                                       |           |

| <b>Grading Scheme</b><br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                |                         |                     |          |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade                   | التقدير             | Marks %  | Definition                            |
| <b>Success Group</b><br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                   | <b>A – Excellent</b>    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>B - Very Good</b>    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>C – Good</b>         | جيد                 | 70 - 79  | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>D - Satisfactory</b> | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>E – Sufficient</b>   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                        | <b>FX – Fail</b>        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>F – Fail</b>         | راسب                | (0-44)   | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                         |                     |          |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                         |                     |          |                                       |

## Module 2

### MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

|                           |
|---------------------------|
| <b>Module Information</b> |
|---------------------------|

| معلومات المادة الدراسية            |                               |                      |                                                                                                                                                                                                                                          |                              |
|------------------------------------|-------------------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Module Title                       | Algorithm design and Analysis |                      | Module Delivery                                                                                                                                                                                                                          |                              |
| Module Type                        | Core                          |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input checked="" type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                              |
| Module Code                        | CyB207                        |                      |                                                                                                                                                                                                                                          |                              |
| ECTS Credits                       | 6                             |                      |                                                                                                                                                                                                                                          |                              |
| SWL (hr/sem)                       | 150                           |                      |                                                                                                                                                                                                                                          |                              |
| Module Level                       | 2                             | Semester of Delivery |                                                                                                                                                                                                                                          | 2                            |
| Administering Department           | CyS                           | College              | CSIT                                                                                                                                                                                                                                     |                              |
| Module Leader                      | Athman Dhiya Abdulsatar       |                      | e-mail                                                                                                                                                                                                                                   | athman.dhiya@uobasrah.edu.iq |
| Module Leader's Acad. Title        | Asst. lec.                    |                      | Module Leader's Qualification                                                                                                                                                                                                            |                              |
| Module Tutor                       | Name (if available)           |                      | e-mail                                                                                                                                                                                                                                   |                              |
| Peer Reviewer Name                 |                               | e-mail               | E-mail                                                                                                                                                                                                                                   |                              |
| Scientific Committee Approval Date |                               | Version Number       |                                                                                                                                                                                                                                          |                              |

| Relation with other Modules       |                          |          |          |
|-----------------------------------|--------------------------|----------|----------|
| العلاقة مع المواد الدراسية الأخرى |                          |          |          |
| Prerequisite module               | Programming Fundamentals |          | Semester |
|                                   | Discrete Mathematics     |          |          |
|                                   | Data Structures          |          |          |
| Co-requisites module              |                          | Semester |          |

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                |
| <b>Module Objectives</b><br>أهداف المادة الدراسية        | 1. Understand Fundamental Concepts:<br><b>To provide</b> students with a solid understanding of the fundamental concepts of algorithm design and analysis, including <b>time</b> and <b>space complexity</b> , <b>asymptotic notation</b> , and <b>algorithmic paradigms</b> . |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                             | <p>2. Develop Problem-Solving Skills:<br/> <b>To equip</b> students with the ability to design and analyze efficient algorithms for <b>solving real-world problems</b>.</p> <p>3. Enhance Programming Proficiency:<br/> <b>To improve</b> students' <b>programming skills</b> by implementing various <b>algorithms</b> and <b>data structures</b>.</p> <p>4. Prepare for Academic and Professional Challenges:<br/> <b>To prepare</b> students for advanced studies in computer science and for <b>professional roles that require strong algorithmic problem-solving skills</b>.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <p><b>Upon successful completion of this course, students will be able to:</b></p> <ol style="list-style-type: none"> <li>1. formulate computational problems precisely and design appropriate algorithms.</li> <li>2.</li> <li>3. Apply standard algorithmic paradigms such as divide-and-conquer, greedy methods, and dynamic programming.</li> <li>4.</li> <li>5. Analyze time and space complexity using asymptotic notation.</li> <li>6.</li> <li>7. Prove algorithm correctness using rigorous mathematical reasoning.</li> <li>8.</li> <li>9. Design and analyze graph algorithms for real-world problem settings.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <p>The course covers the fundamental principles and methodologies of algorithm design and analysis, with emphasis on correctness, efficiency, and applicability. Indicative topics include, but are not limited to, the following:</p> <p>The nature and role of algorithms in computer science, including formal definitions, problem abstraction, and algorithmic modeling. Introduction to computational efficiency and the distinction between algorithm design and implementation.</p> <p>Asymptotic analysis of algorithms, including worst-case, average-case, and best-case performance. Use of asymptotic notations (Big-O, Big-Theta, Big-Omega) to compare algorithm growth rates and assess scalability.</p> <p>Divide-and-conquer techniques, including recursive problem decomposition, recurrence relations, and the Master Theorem. Applications to fundamental algorithms such as binary search, merge sort, and fast arithmetic algorithms.</p> <p>Greedy algorithm design, focusing on the greedy-choice property and optimal substructure. Formal proof techniques for greedy correctness. Classical applications including interval scheduling, Huffman coding, and minimum spanning tree algorithms.</p> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>Dynamic programming methodology, including problem decomposition, state definition, and transition formulation. Bottom-up and top-down approaches. Classical problems such as the knapsack problem, longest common subsequence, and sequence alignment.</p> <p>Graph algorithms, including graph representations, traversal techniques (breadth-first search and depth-first search), and analysis of correctness and complexity.</p> <p>Advanced graph problems, including shortest path algorithms, network flow, and bipartite matching. Introduction to maximum flow algorithms and their applications.</p> <p>Computational complexity theory fundamentals, including polynomial-time computation, reductions, and the classification of problems into complexity classes. Introduction to NP-completeness and its implications for algorithm design.</p> |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | To achieve the module objectives and learning outcomes, a variety of teaching and learning strategies will be employed. These strategies are designed to cater to different learning styles, promote active engagement, and ensure a deep understanding of the material. |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Student Workload (SWL)

#### الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

|                                                                                |            |                                                                           |  |
|--------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------|--|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       |            | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       |  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل |            | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا |  |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | <b>175</b> |                                                                           |  |

### Module Evaluation

#### تقييم المادة الدراسية

|  | Time/Number | Weight (Marks) | Week Due | Relevant Learning Outcome |
|--|-------------|----------------|----------|---------------------------|
|--|-------------|----------------|----------|---------------------------|

|                             |                             |     |                  |        |     |
|-----------------------------|-----------------------------|-----|------------------|--------|-----|
| <b>Formative assessment</b> | <b>Quizzes</b>              | 1   | 10% (10)         | 5      |     |
|                             | <b>Assignments</b>          | 1   | 10% (10)         | 3      |     |
|                             | <b>In class Assignments</b> | 1   | 10% (10)         | 9      |     |
|                             | <b>Report</b>               | 1   | 10% (10)         | 13     | All |
| <b>Summative assessment</b> | <b>Midterm Exam</b>         | 1hr | 10% (10)         | 7 or 8 |     |
|                             | <b>Final Exam</b>           | 2hr | 50% (50)         | 16     | All |
| <b>Total assessment</b>     |                             |     | 100% (100 Marks) |        |     |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                               |
|-------------------------------------------------------------------|-----------------------------------------------|
|                                                                   | <b>Material Covered</b>                       |
| <b>Week 1</b>                                                     | Introduction to Algorithms                    |
| <b>Week 2</b>                                                     | Mathematical Analysis of Algorithms           |
| <b>Week 3</b>                                                     | Divide-and-Conquer                            |
| <b>Week 4</b>                                                     | Advanced Divide and Conquer                   |
| <b>Week 5</b>                                                     | Greedy Algorithms – Theory                    |
| <b>Week 6</b>                                                     | Review                                        |
| <b>Week 7</b>                                                     | Mid Exam                                      |
| <b>Week 8</b>                                                     | Greedy Algorithms – Applications              |
| <b>Week 9</b>                                                     | Dynamic Programming – Foundations & Classical |
| <b>Week 10</b>                                                    | Advanced Dynamic Programming                  |
| <b>Week 11</b>                                                    | Graph Algorithms                              |
| <b>Week 12</b>                                                    | Graph Algorithms                              |
| <b>Week 13</b>                                                    | Seminar                                       |
| <b>Week 14</b>                                                    | Report discussion                             |
| <b>Week 15</b>                                                    | Report discussion                             |
| <b>Week 16</b>                                                    | <b>Exam</b>                                   |

| Delivery Plan (Weekly Lab. Syllabus) |                  |
|--------------------------------------|------------------|
| المنهاج الاسبوعي للمختبر             |                  |
|                                      | Material Covered |
| Week 1                               |                  |
| Week 2                               |                  |
| Week 3                               |                  |
| Week 4                               |                  |
| Week 5                               |                  |
| Week 6                               |                  |
| Week 7                               |                  |
| Week 8                               |                  |
| Week 9                               |                  |
| Week 10                              |                  |
| Week 11                              |                  |
| Week 12                              |                  |
| Week 13                              |                  |
| Week 14                              |                  |
| Week 15                              |                  |
|                                      |                  |

| Learning and Teaching Resources |                                                                                                                                                                                                                                    |                           |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| مصادر التعلم والتدريس           |                                                                                                                                                                                                                                    |                           |
|                                 | Text                                                                                                                                                                                                                               | Available in the Library? |
| Required Texts                  | Algorithm design / Jon Kleinberg, ´Eva Tardos.—1st ed.                                                                                                                                                                             | No                        |
| Recommended Texts               | <p><b>Cormen, T. H., Leiserson, C. E., Rivest, R. L., &amp; Stein, C.</b> <i>Introduction to Algorithms</i>, 4th ed., MIT Press, 2022.</p> <p><b>Skiena, S. S.</b> <i>The Algorithm Design Manual</i>, 3rd ed., Springer, 2020</p> | No                        |
| Websites                        | <a href="https://www.geeksforgeeks.org/dsa/dsa-tutorial-learn-data-structures-and-algorithms/">https://www.geeksforgeeks.org/dsa/dsa-tutorial-learn-data-structures-and-algorithms/</a>                                            |                           |

| Grading Scheme<br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                       |                  |                     |          |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks %  | Definition                            |
| Success Group<br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                          | A – Excellent    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | B - Very Good    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | C – Good         | جيد                 | 70 - 79  | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | D - Satisfactory | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | E – Sufficient   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                               | FX – Fail        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | F – Fail         | راسب                | (0-44)   | Considerable amount of work required  |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                  |                     |          |                                       |

## Module 3

### MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| معلومات المادة الدراسية              |                              |                 |                                                                                                                                                                         |                                        |                    |
|--------------------------------------|------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|--------------------|
| عنوان الوحدة                         | Dynamic Websites Programming |                 | طرق إيصال المادة العلمية                                                                                                                                                |                                        |                    |
| نوع الوحدة                           | Basic                        |                 | <ul style="list-style-type: none"><li>• نظري</li><li>• محاضرات مفتوحة للطالب</li><li>• مختبرات</li><li>• أفلام علمية</li><li>• سمنيارات</li><li>• سفرات علمية</li></ul> |                                        |                    |
| نموذجCode                            | CyB208                       |                 |                                                                                                                                                                         |                                        |                    |
| الساعات المعتمدة ضمن النظام الأوروبي | 3                            |                 |                                                                                                                                                                         |                                        |                    |
| SWL (hr/sem)                         | 100                          |                 |                                                                                                                                                                         |                                        |                    |
| المرحلة الدراسية                     |                              | الثانية         | فصل الدراسي                                                                                                                                                             |                                        | 2                  |
| القسم الاداري                        |                              | الامن السيبراني | الكلية                                                                                                                                                                  | كلية علوم الحاسوب وتكنولوجيا المعلومات |                    |
| مدرس المادة                          | رعد عبدالحسن مهجر            |                 | e-mail                                                                                                                                                                  | raad.muhammad@uobasrah.edu.iq          |                    |
| اللقب العلمي                         |                              | استاذ           | المؤهلات                                                                                                                                                                |                                        | دكتوراة علوم حاسوب |

|                             |         |             |        |
|-----------------------------|---------|-------------|--------|
| مدرس مادة                   | لا يوجد | e-mail      | E-mail |
| المصادر                     | لا يوجد | e-mail      | E-mail |
| تاريخ موافقة اللجنة العلمية |         | رقم الاصدار |        |

| العلاقة مع المواد الدراسية الأخرى |                       |               |         |
|-----------------------------------|-----------------------|---------------|---------|
| متطلبات الأساسية للوحدة           | تصميم المواقع الثابتة | الفصل الدراسي | الاول   |
| متطلبات الوحدة الأخرى             | لا يوجد               | الفصل الدراسي | لا يوجد |

| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية                                    | <ol style="list-style-type: none"> <li>1. فهم الفرق بين المواقع الثابتة والمواقع الديناميكية</li> <li>2. تنفيذ السلوك الديناميكي باستخدام JavaScript</li> <li>3. التعامل مع نموذج كائن المستند (DOM) ومعالجة الأحداث</li> <li>4. تطوير تطبيقات جهة الخادم باستخدام Node.js</li> <li>5. الاتصال بقواعد بيانات MySQL وإدارتها</li> <li>6. بناء تطبيقات ديناميكية من خلال دمج الواجهة الأمامية مع الواجهة الخلفية</li> </ol> |
| مخرجات التعلم للمادة الدراسية                            | <ol style="list-style-type: none"> <li>1. تصميم صفحات ويب ديناميكية باستخدام JavaScript</li> <li>2. تطبيق مفاهيم البرمجة باستخدام JavaScript</li> <li>3. التحكم في عناصر صفحات الويب باستخدام DOM</li> <li>4. تطوير تطبيقات جهة الخادم باستخدام Node.js</li> <li>5. تنفيذ عمليات قواعد البيانات باستخدام MySQL</li> <li>6. دمج مكونات الواجهة الأمامية مع الواجهة الخلفية</li> </ol>                                      |

## استراتيجيات التعلم والتعليم

### •المحاضرات والعروض التوضيحية

تقديم المفاهيم النظرية الأساسية مدعومة بالبرمجة المباشرة وأمثلة من تطبيقات الويب الواقعية.

### •المختبرات العملية التطبيقية

توفير تدريب عملي مستمر على البرمجة لتطوير مهارات الطلبة في بناء تطبيقات ويب ديناميكية وتفاعلية.

### •التعلم القائم على المشاريع والتعلم التعاوني

إشراك الطلبة في مشاريع فردية وجماعية لمحاكاة بيئات التطوير الحقيقية في سوق العمل.

### •التقييم المستمر والتغذية الراجعة

استخدام الواجبات والاختبارات وتقييم المشاريع مع تقديم تغذية راجعة منتظمة لتحسين مخرجات التعلم.

الاستراتيجيات

## الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا

|                                             |     |                                          |   |
|---------------------------------------------|-----|------------------------------------------|---|
| الحمل الدراسي المنتظم للطلاب خلال الفصل     | 64  | الحمل الدراسي المنتظم للطلاب أسبوعيا     | 4 |
| الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 36  | الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 2 |
| الحمل الدراسي الكلي للطلاب خلال الفصل       | 100 |                                          |   |

| تقييم المادة الدراسية   |                |             |                  |          |                        |
|-------------------------|----------------|-------------|------------------|----------|------------------------|
|                         |                | الوقت/العدد | (الوزن)/ الدرجات | الأسابيع | نتائج التعلم ذات الصلة |
| التقييم التكويني        | اختبارات يومية | 1           | %10              | 5 من 10  | LO #1, #2 and #10, #11 |
|                         | واجبات         | 1           | %10              | 2 من 12  | LO #3, #4 and #6, #7   |
|                         | المشروع        | 1           | %10              | مستمر    | All                    |
|                         | تقرير          | 1           | %10              | 13       | LO #5, #8 and #10      |
| التقييم النهائي         | امتحان النصف   | 2 ساعة      | %10              | 7        | LO #1 - #7             |
|                         | امتحان النهائي | 3 ساعات     | %50              | 16       | All                    |
| المجموع الكلي للتقديرات |                |             | %100 درجات       |          |                        |

| المنهاج الأسبوعي النظري |                                                             |
|-------------------------|-------------------------------------------------------------|
|                         | المواد التي يغطيها                                          |
| الأسبوع 1               | مقدمة في تصميم الويب الديناميكي                             |
| الأسبوع 2               | (JavaScript و CSS و HTML أساسيات) مراجعة تصميم الويب الثابت |
| الأسبوع 3               | JavaScript أساسيات                                          |
| الأسبوع 4               | هياكل التحكم (الشروط والحلقات)                              |
| الأسبوع 5               | (Scope) الدوال ونطاق المتغيرات                              |
| الأسبوع 6               | المصفوفات والكائنات                                         |
| الأسبوع 7               | والأحداث DOM التعامل مع                                     |
| الأسبوع 8               | (Client-Server) مفاهيم العميل – الخادم                      |

|            |                                                          |
|------------|----------------------------------------------------------|
| الاسبوع 9  | Node.js مقدمة في                                         |
| الاسبوع 10 | (أساسيات قواعد البيانات) MySQL مع Node.js                |
| الاسبوع 11 | (أساسيات قواعد البيانات) MySQL مع Node.js                |
| الاسبوع 12 | (CRUD عمليات) Node.js باستخدام MySQL عمليات قواعد بيانات |
| الاسبوع 13 | (CRUD عمليات) Node.js باستخدام MySQL عمليات قواعد بيانات |
| الاسبوع 14 | تنفيذ المشروع النهائي                                    |
| الاسبوع 15 | الامتحان النهائي                                         |

| المنهاج الاسبوعي للمختبر |                                  |
|--------------------------|----------------------------------|
|                          | المواد التي سيتم تغطيتها بالمنهج |
| الاسبوع 1                | CSS و HTML مشروع مراجعة          |
| الاسبوع 2                | JavaScript تمارين                |
| الاسبوع 3                | DOM مهام التعامل مع              |
| الاسبوع 4                | Node.js برمجة                    |
| الاسبوع 5                | MySQL عمليات قواعد بيانات        |
| الاسبوع 6                | تنفيذ تطبيق ديناميكي كامل        |
| الاسبوع 7                | JavaScript تمارين                |

| مصادر التعلم والتدريس |
|-----------------------|
|-----------------------|

| متوفر في المكتبة؟                   | المصدر                                                                                                                                                                                                   |                   |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Available in the electronic library | 1. Duckett, J. JavaScript and JQuery: Interactive Front-End Web Development<br>2. Flanagan, D. JavaScript: The Definitive Guide<br>3. Node.js Official Documentation<br><br>MySQL Official Documentation | المصدر المطلوب    |
| Available in the electronic library | <b>Web Development with Node &amp; Express — Ethan Brown</b><br><b>Node.js Web Development — David Herron</b><br><b>Node Cookbook — Bethany Griggs</b>                                                   | المصدر الموصى بها |
|                                     | <b>MDN – Express / Node.js Learning Path</b><br><b>Official Node.js Documentation (General Reference)</b><br><b>Community / Learning Lists (GitHub Node Books Collection)</b>                            |                   |
|                                     |                                                                                                                                                                                                          | موقع الكتروني     |

| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                                   |                |                     |           |                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------|-----------|--------------------------------------------------|
| المجموعة                                                                                                                                                                                                                                                                                                                                                                       | Grade          | التقدير             | الدرجات % | التعريف                                          |
| مجموعة النجاح<br>100(-50)                                                                                                                                                                                                                                                                                                                                                      | أ ( الامتياز ) | امتياز              | 90 - 100  | الأداء متميز                                     |
|                                                                                                                                                                                                                                                                                                                                                                                | ب- جيد جدا     | جيد جدا             | 80 - 89   | أعلى من المتوسط مع بعض الأخطاء                   |
|                                                                                                                                                                                                                                                                                                                                                                                | ج (جيد)        | جيد                 | 70 - 79   | عمل سليم مع أخطاء ملحوظة                         |
|                                                                                                                                                                                                                                                                                                                                                                                | د ( مرضي)      | متوسط               | 60 - 69   | متوسطة ولكن مع عيوب كبيرة                        |
|                                                                                                                                                                                                                                                                                                                                                                                | هـ- مقبول      | مقبول               | 50 - 59   | الاداء يلبي الحد الأدنى من المعايير              |
| مجموعة الفشل<br>49(-0)                                                                                                                                                                                                                                                                                                                                                         | الفشل (رسوب)   | راسب (قيد المعالجة) | (45-49)   | مطلوب المزيد من العمل ولكن تم منح الائتمان       |
|                                                                                                                                                                                                                                                                                                                                                                                | الرسوب         | راسب                | (0-44)    | يحتاج للمزيد من العمل والجهد لنيل متطلبات النجاح |
|                                                                                                                                                                                                                                                                                                                                                                                |                |                     |           |                                                  |
| <p><b>ملاحظة:</b> العلامات سيتم تقريب الأماكن العشرية أعلى أو أقل من 0.5 إلى العلامة الكاملة الأعلى أو الأدنى (على سبيل المثال، سيتم تقريب العلامة 54.5 إلى 55، بينما سيتم تقريب العلامة 54.4 إلى 54. لدى الجامعة سياسة عدم التغاضي عن "فشل النجاح القريب" لذا فإن التعديل الوحيد على العلامات التي تمنحها العلامة (العلامات) الأصلية سيكون التقريب التلقائي الموضح أعلاه.</p> |                |                     |           |                                                  |

## Module 4

### MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

| Module Information                 |                           |                               |                                                                                                                                                                                                                                                     |
|------------------------------------|---------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                           |                               |                                                                                                                                                                                                                                                     |
| Module Title                       | Cyber Security Principles |                               | Module Delivery                                                                                                                                                                                                                                     |
| Module Type                        | Core                      |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | CyS109                    |                               |                                                                                                                                                                                                                                                     |
| ECTS Credits                       | 6                         |                               |                                                                                                                                                                                                                                                     |
| SWL (hr/sem)                       | 150                       |                               |                                                                                                                                                                                                                                                     |
| Module Level                       | 1                         | Semester of Delivery          |                                                                                                                                                                                                                                                     |
| Administering Department           | CyS                       | College                       | College of Computer Science and Information Technology                                                                                                                                                                                              |
| Module Leader                      | Name                      | e-mail                        | E-mail                                                                                                                                                                                                                                              |
| Module Leader's Acad. Title        | Professor                 | Module Leader's Qualification | Ph.D.                                                                                                                                                                                                                                               |
| Module Tutor                       | Name (if available)       | e-mail                        | E-mail                                                                                                                                                                                                                                              |
| Peer Reviewer Name                 | Name                      | e-mail                        | E-mail                                                                                                                                                                                                                                              |
| Scientific Committee Approval Date | 01/10/2023                | Version Number                | 1.0                                                                                                                                                                                                                                                 |

| Relation with other Modules       |      |          |  |
|-----------------------------------|------|----------|--|
| العلاقة مع المواد الدراسية الأخرى |      |          |  |
| Prerequisite module               | None | Semester |  |
| Co-requisites module              | None | Semester |  |

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br><b>أهداف المادة الدراسية</b>                      | <p>The aim of this course is to equip students with a strong foundation in cybersecurity principles and practices. By the end of the course, students will have a deep understanding of cybersecurity concepts, be able to recognize and mitigate common security threats, and appreciate the ethical and legal aspects of cybersecurity.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Module Learning Outcomes</b><br><b>مخرجات التعلم للمادة الدراسية</b> | <p>By the end of this course, students will:</p> <ol style="list-style-type: none"> <li>Understand Cybersecurity Fundamentals: Gain a strong foundation in cybersecurity principles, terminologies, and concepts.</li> <li>Identify Security Threats: Recognize common cybersecurity threats and vulnerabilities.</li> <li>Implement Security Measures: Learn practical strategies and tools to secure digital systems and networks.</li> <li>Analyze Security Incidents: Develop skills to investigate and respond to security incidents.</li> <li>Promote Cybersecurity Awareness: Understand the importance of cybersecurity in today's digital world and promote best practices.</li> <li>Incident Response and Recovery: Students should be capable of developing and implementing an incident response plan, as well as understanding the steps involved in responding to and recovering from cybersecurity incidents.</li> <li>Legal and Ethical Considerations: Students should have an awareness of the legal and ethical aspects of cybersecurity, including compliance with relevant laws and regulations, ethical hacking, and the consequences of cybercrimes.</li> </ol> |
| <b>Indicative Contents</b><br><b>المحتويات الإرشادية</b>                | <p>The indicative contents of the "Cyber Security Principles" course include an introduction to cybersecurity fundamentals, exploration of the cyber threat landscape, information security principles, network security, cryptography, access control and authentication, incident response, and legal and ethical considerations. These topics collectively provide students with a holistic understanding of cybersecurity concepts and practices.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                           |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <p>The course employs a combination of teaching strategies, including lectures, interactive discussions, hands-on labs, and group projects. These strategies foster active engagement and practical application of cybersecurity principles, ensuring students grasp theoretical concepts while gaining valuable real-world experience. Additionally,</p> |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|  |                                                                                                                                                               |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | guest lectures by industry experts and participation in cybersecurity-related events enhance students' exposure to current industry practices and challenges. |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                  |     |                                                                     |     |
|-------------------------------------------------------------------------|-----|---------------------------------------------------------------------|-----|
| الحمل الدراسي للطالب                                                    |     |                                                                     |     |
| Structured SWL (h/sem)<br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 49  | Structured SWL (h/w)<br>الحمل الدراسي المنتظم للطالب أسبوعياً       | 3.2 |
| Unstructured SWL (h/sem)<br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 76  | Unstructured SWL (h/w)<br>الحمل الدراسي غير المنتظم للطالب أسبوعياً | 5   |
| Total SWL (h/sem)<br>الحمل الدراسي الكلي للطالب خلال الفصل              | 125 |                                                                     |     |

| Module Evaluation     |                 |             |                  |            |                           |
|-----------------------|-----------------|-------------|------------------|------------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |            |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 10% (10)         | 5, 10      | LO #1, 2, 3               |
|                       | Assignments     | 2           | 10% (10)         | 2, 12      | LO # 3, 4, 6              |
|                       | Projects / Lab. | 1           | 10% (10)         | Continuous | All                       |
|                       | Report          | 1           | 10% (10)         | 13         | LO # 5, 7                 |
| Summative assessment  | Midterm Exam    | 2 hr        | 10% (10)         | 7          | LO # 1-7                  |
|                       | Final Exam      | 2 hr        | 50% (50)         | 16         | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |            |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                                              |
|---------------------------------|--------------------------------------------------------------------------------------------------------------|
| المنهاج الأسبوعي النظري         |                                                                                                              |
|                                 | Material Covered                                                                                             |
| Week 1                          | Introduction to Cyber Security<br>Definition and importance of cybersecurity.                                |
| Week 2                          | Historical development and evolution of cyber threats.<br>Ethical and legal considerations in cybersecurity. |

|         |                                                                                                                  |
|---------|------------------------------------------------------------------------------------------------------------------|
| Week 3  | Cyber Threat Landscape<br>Types of cyber threats (e.g., malware, phishing, DDoS attacks).                        |
| Week 4  | Understanding threat actors and motivations.                                                                     |
| Week 5  | Information Security Principles<br>Confidentiality, integrity, and availability (CIA triad).                     |
| Week 6  | Security policies, standards, and guidelines.                                                                    |
| Week 7  | Network Security<br>Network security basics.                                                                     |
| Week 8  | Firewalls, intrusion detection systems (IDS), and intrusion prevention systems (IPS).                            |
| Week 9  | Cryptography<br>Principles of encryption and decryption.                                                         |
| Week 10 | Cryptographic algorithms and protocols.                                                                          |
| Week 11 | Access Control and Authentication<br>User authentication methods (e.g., passwords, multi-factor authentication). |
| Week 12 | Role-based access control (RBAC) and permissions.                                                                |
| Week 13 | Security Incidents and Response<br>Identifying and responding to security incidents.                             |
| Week 14 | Developing an incident response plan.                                                                            |
| Week 15 | Final Review and Examination                                                                                     |

| Delivery Plan (Weekly Lab. Syllabus) |                                                                                                          |
|--------------------------------------|----------------------------------------------------------------------------------------------------------|
| المنهاج الاسبوعي للمختبر             |                                                                                                          |
|                                      | Material Covered                                                                                         |
| Week 1                               | Lab1: Introduction to Lab Environment<br>Setting up the lab environment                                  |
| Week 2                               | Lab 2: introduction to lab tools and resources.                                                          |
| Week 3                               | Lab 3: Vulnerability Assessment (Aligned with Cyber Threat Landscape)<br>Conducting vulnerability scans. |
| Week 4                               | Lab 4: Identifying and prioritizing vulnerabilities.                                                     |
| Week 5                               | Lab 5: Network Monitoring (Aligned with Network Security)<br>Monitoring network traffic and anomalies.   |
| Week 6                               | Lab 6: Analyzing network logs and events.                                                                |
| Week 7                               | Lab 7: Ethical Hacking (Aligned with Ethical Hacking)                                                    |

|                |                                                                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | Introduction to ethical hacking.                                                                                                                            |
| <b>Week 8</b>  | Lab8: Performing ethical hacking exercises.                                                                                                                 |
| <b>Week 9</b>  | Lab9: Incident Response (Aligned with Security Incidents and Response)<br>Developing an incident response plan.                                             |
| <b>Week 10</b> | Lab10: Identifying, analyzing, and mitigating security incidents.                                                                                           |
| <b>Week 11</b> | Lab11: Security Solutions (Aligned with Security Solutions)<br>Configuring and deploying security solutions (e.g., firewalls, intrusion detection systems). |
| <b>Week 12</b> | Lab12: Conducting security assessments.                                                                                                                     |
| <b>Week 13</b> | Lab13: Group Projects (Aligned with Various Topics)                                                                                                         |
| <b>Week 14</b> | Lab14: Collaborative group projects on cybersecurity scenarios.                                                                                             |
| <b>Week 15</b> | Lab15: Final Lab Review and Assessment (Aligned with Final Review and Examination)                                                                          |

| Learning and Teaching Resources<br>مصادر التعلم والتدريس |                                                                                                                            |                           |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                          | Text                                                                                                                       | Available in the Library? |
| Required Texts                                           | <b>"Cybersecurity: Principles and Practice" by William Stallings and Lawrie Brown</b>                                      | No                        |
| Recommended Texts                                        | <b>"Introduction to Computer and Network Security: Navigating Shades of Gray" by Timothy Shimeall and Jonathan Spring:</b> | No                        |
| Websites                                                 |                                                                                                                            |                           |

| Grading Scheme<br>مخطط الدرجات |                  |                     |           |                                       |
|--------------------------------|------------------|---------------------|-----------|---------------------------------------|
| Group                          | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(50 - 100)    | A - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                | B - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                | C - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                | D - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                | E - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)         | FX – Fail        | راسب (قيد المعالجة) | (45-49)   | More work required but credit awarded |
|                                | F – Fail         | راسب                | (0-44)    | Considerable amount of work required  |
|                                |                  |                     |           |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 5

### MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

| Module Information                 |                                          |                               |                                                                                                                                                                                                                                          |
|------------------------------------|------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                                          |                               |                                                                                                                                                                                                                                          |
| Module Title                       | <b>Crimes of the Former Ba'ath Party</b> |                               | Module Delivery                                                                                                                                                                                                                          |
| Module Type                        | Support                                  |                               | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code                        | UOB 202                                  |                               |                                                                                                                                                                                                                                          |
| ECTS Credits                       | 2                                        |                               |                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 50                                       |                               |                                                                                                                                                                                                                                          |
| Module Level                       |                                          | Semester of Delivery          |                                                                                                                                                                                                                                          |
| Administering Department           |                                          | College                       |                                                                                                                                                                                                                                          |
| Module Leader                      | م.م. زينب علي حسين                       | e-mail                        | zainab.ali@uobasrah.edu.iq                                                                                                                                                                                                               |
| Module Leader's Acad. Title        |                                          | Module Leader's Qualification |                                                                                                                                                                                                                                          |
| Module Tutor                       |                                          | e-mail                        |                                                                                                                                                                                                                                          |
| Peer Reviewer Name                 |                                          | e-mail                        |                                                                                                                                                                                                                                          |
| Scientific Committee Approval Date |                                          | Version Number                |                                                                                                                                                                                                                                          |

### Relation with other Modules

#### العلاقة مع المواد الدراسية الأخرى

|                             |                                                                                                                                                                                                                                                                                                                                                                                    |                 |  |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--|
| <b>Prerequisite module</b>  | This course emphasizes to students the necessity of adhering to ethical principles in teaching this knowledge-based subject, which must be passed on to current and future generations. It focuses on studying and teaching a period in Iraqi history known for violations of human rights, committing crimes against humanity, and being notorious for mass graves and genocides. | <b>Semester</b> |  |
| <b>Co-requisites module</b> | None                                                                                                                                                                                                                                                                                                                                                                               | <b>Semester</b> |  |

### Module Aims, Learning Outcomes and Indicative Contents

#### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b><br>أهداف المادة الدراسية                | The importance of the curriculum lies in exposing students to the crimes committed against Iraqi scholars, including religious figures who opposed the Ba'ath Party, the suppression of the Shiite uprising, and the crimes against the Turkmen, particularly in the 199th District of Kirkuk Governorate, which included forced displacement, land confiscation, and annexation to other governorates. It also covers cross-border crimes that led to external wars against neighboring countries such as Iran and Kuwait. |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                | This represents a missing research-based knowledge gap in Iraqi studies, concerning more than three decades during which the Ba'ath Party ruled Iraq and committed significant human and political crimes. The material is presented to students for direct discussion through question-and-answer methods.                                                                                                                                                                                                                 |

### Learning and Teaching Strategies

#### استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | <ol style="list-style-type: none"> <li>1. Lectures on the subject delivered in paper format.</li> <li>2. Delivering lectures in a detailed and comprehensive manner.</li> <li>3. Assigning periodic reports and homework on the main topics of the course.</li> <li>4. Daily discussions to assess students' understanding of the material and to evaluate daily participation.</li> <li>5. Daily quizzes, monthly exams covering the curriculum, and a final exam.</li> </ol> |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا       |  |                                                                           |  |
|--------------------------------------------------------------------------------|--|---------------------------------------------------------------------------|--|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       |  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       |  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل |  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا |  |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              |  |                                                                           |  |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                     |             |                  |          |                           |
|---------------------------------------------------|---------------------|-------------|------------------|----------|---------------------------|
|                                                   |                     | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | <b>Quizzes</b>      | 2           | 10% (10)         | 5 and 10 | LO #1, #2 and #10         |
|                                                   | <b>Assignments</b>  | 2           | 10% (10)         | 2 and 12 | LO #3, #4 and #6, #7      |
|                                                   | <b>Report</b>       | 1           | 20% (20)         | 13       | LO #5, #8 and #10         |
| <b>Summative assessment</b>                       | <b>Midterm Exam</b> | 2hr         | 10% (10)         | 7        | LO #1 - #7                |
|                                                   | <b>Final Exam</b>   | 3hr         | 50% (50)         | 16       | All                       |
| <b>Total assessment</b>                           |                     |             | 100% (100 Marks) |          |                           |

| <b>Delivery Plan (Weekly Syllabus)</b> |
|----------------------------------------|
|----------------------------------------|

## المناهج الاسبوعي النظري

|                | Material Covered                                                                            |
|----------------|---------------------------------------------------------------------------------------------|
| <b>Week 1</b>  | <b>Section One:</b> Descriptive Overview of Political Systems in Iraq (1921–2003)           |
| <b>Week 2</b>  | <b>Section Two:</b> Violations of Rights and Public Freedoms by the Ba'athist Regime        |
| <b>Week 3</b>  | <b>Section Three:</b> Impact of the Ba'athist Regime's Behavior on Society                  |
| <b>Week 4</b>  | <b>Section Four:</b> Effects of the Transitional Period in Combating Authoritarian Policies |
| <b>Week 5</b>  | Psychological and Social Aspects                                                            |
| <b>Week 6</b>  | Religion and State                                                                          |
| <b>Week 7</b>  | Culture, Media, and the Militarization of Society                                           |
| <b>Week 8</b>  | <b>First Exam:</b>                                                                          |
| <b>Week 9</b>  | Impact of Wars on the Environment and Population                                            |
| <b>Week 10</b> | Use of Internationally Prohibited Weapons and Environmental Pollution                       |
| <b>Week 11</b> | Scorched Earth Policy                                                                       |
| <b>Week 12</b> | Draining of Marshes and Forced Migration                                                    |
| <b>Week 13</b> | Destruction of Agricultural Environment                                                     |
| <b>Week 14</b> | Mass Graves and Bombing of Places of Worship                                                |
| <b>Week 15</b> | <b>Final Exam</b>                                                                           |
| <b>Week 16</b> | <b>Section One:</b> Descriptive Overview of Political Systems in Iraq (1921–2003)           |

## Learning and Teaching Resources

### مصادر التعلم والتدريس

|                          | Text | Available in the Library? |
|--------------------------|------|---------------------------|
| <b>Required Texts</b>    |      | Yes                       |
| <b>Recommended Texts</b> |      |                           |
| <b>Websites</b>          |      |                           |

## Grading Scheme

### مخطط الدرجات

| Group                       | Grade            | التقدير             | Marks %  | Definition                            |
|-----------------------------|------------------|---------------------|----------|---------------------------------------|
| Success Group<br>(50 - 100) | A - Excellent    | امتياز              | 90 - 100 | Outstanding Performance               |
|                             | B - Very Good    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                             | C - Good         | جيد                 | 70 - 79  | Sound work with notable errors        |
|                             | D - Satisfactory | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                             | E - Sufficient   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)      | FX – Fail        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                             | F – Fail         | راسب                | (0-44)   | Considerable amount of work required  |
|                             |                  |                     |          |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 6

### MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| Module Information       |            |                      |                                                                                                                                                                                                                               |
|--------------------------|------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية  |            |                      |                                                                                                                                                                                                                               |
| Module Title             | English II |                      | Module Delivery                                                                                                                                                                                                               |
| Module Type              | Basic      |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code              | CyB 111    |                      |                                                                                                                                                                                                                               |
| ECTS Credits             | 3          |                      |                                                                                                                                                                                                                               |
| SWL (hr/sem)             | 75         |                      |                                                                                                                                                                                                                               |
| Module Level             | 1          | Semester of Delivery | 2                                                                                                                                                                                                                             |
| Administering Department | CyB        | College              | CSIT                                                                                                                                                                                                                          |
| Module Leader            |            | e-mail               |                                                                                                                                                                                                                               |

|                                           |           |                                      |       |
|-------------------------------------------|-----------|--------------------------------------|-------|
| <b>Module Leader's Acad. Title</b>        | Professor | <b>Module Leader's Qualification</b> | Ph.D. |
| <b>Module Tutor</b>                       |           | <b>e-mail</b>                        |       |
| <b>Peer Reviewer Name</b>                 |           | <b>e-mail</b>                        |       |
| <b>Scientific Committee Approval Date</b> | / /2023   | <b>Version Number</b>                | 1.0   |

| <b>Relation with other Modules</b><br>العلاقة مع المواد الدراسية الأخرى |        |                 |  |
|-------------------------------------------------------------------------|--------|-----------------|--|
| <b>Prerequisite module</b>                                              | CyB105 | <b>Semester</b> |  |
| <b>Co-requisites module</b>                                             | None   | <b>Semester</b> |  |

| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b><br>أهداف المادة الدراسية                                                                         | 7. Developing communication approaches.<br>8. Enhancing total physical response (TPR).<br>9. Establishing multi-outcome learning (English and science knowledge for instance).                                                                                                                                                                                                                                                     |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية                                                          | 19. <b>Improved Communication Skills:</b> Students should be able to communicate more effectively in English, expressing themselves with greater fluency and accuracy. They can participate in everyday conversations, express opinions, and discuss various topics.<br>20. <b>Expanded Vocabulary:</b> Learners should have developed a broader range of vocabulary, allowing them to understand and use a wider variety of words |

|                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                              | <p>and expressions.</p> <p>21. <b>Grammar Proficiency:</b> Students are expected to have a better grasp of English grammar, allowing them to construct more complex sentences and convey different tenses and aspects more accurately.</p> <p>22. <b>Reading Comprehension:</b> Learners should be able to read and comprehend a variety of texts, such as articles, short stories, and excerpts from novels, with a reasonable level of understanding.</p> <p>23. <b>Writing Skills:</b> Students should be able to write coherent paragraphs and short texts, such as emails, letters, and simple essays, demonstrating improved sentence structure and organization.</p> <p>24. <b>Listening Skills:</b> Learners should have developed better listening skills, allowing them to understand and follow conversations, interviews, and media in English with less difficulty.</p> <p>25. <b>Cultural Awareness:</b> At this level, students may have been exposed to various cultural aspects of English-speaking countries, leading to a better understanding of cultural norms and customs.</p> <p>26. <b>Independent Learning:</b> Students should be more confident and independent in their language learning journey, taking initiatives to practice and learn outside of the classroom.</p> <p>27. <b>Preparation for Advanced Levels:</b> English Level II usually serves as a foundation for more advanced language courses. After completing this level, students should be ready to progress to higher-level language studies.</p> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p> | <p>International student:</p> <p>READING: Going abroad to study.</p> <ul style="list-style-type: none"> <li>• Following instructions: filling in forms</li> <li>• Reading methods: skim; scan; intensive reading; extensive reading</li> </ul> <p>WRITING: A host family</p> <ul style="list-style-type: none"> <li>• Checking your writing: error correction - punctuation and spelling</li> <li>• Writing an informal email</li> </ul> <p>Where in the world:</p> <p>READING: Three countries</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Skimming and scanning: reading for the general idea, and for particular information</li> </ul> <p>WRITING: My country</p> <ul style="list-style-type: none"> <li>• Brain storming ideas: topic areas and examples;</li> <li>• completing a paragraph</li> <li>• Linking ideas (1): but, however, although</li> <li>• Writing a description of my country</li> </ul> <p>Newspaper articles:</p> <p>READING: An unexpected journey</p> <ul style="list-style-type: none"> <li>• Predicting content: using the title and the pictures</li> <li>• Meaning from context: guessing the meaning of new words</li> </ul> <p>WRITING My country</p> <ul style="list-style-type: none"> <li>• Brainstorming ideas: topic areas and examples; completing a paragraph</li> <li>• Linking ideas (1): but, however, although Writing a description of my country</li> </ul> <p>Modern technology:</p> <p>READING Innovation</p> <ul style="list-style-type: none"> <li>• Purpose and audience (1 and 2): using visual and written clues</li> </ul> <p>WRITING Mistaken identity</p> <ul style="list-style-type: none"> <li>• Sentences/Paragraphs; helping your writing flow</li> <li>• Varying the structure: making writing interesting Writing an article</li> </ul> <p>Conferences and visits</p> <p>READING: A conference in Istanbul</p> <ul style="list-style-type: none"> <li>• Purpose and audience (1 and 2): using visual and written clues</li> </ul> <p>WRITING Invitations</p> <ul style="list-style-type: none"> <li>• Using formal expressions: writing academic emails and letters</li> <li>• Writing a formal email</li> </ul> <p>Science and our world:</p> <p>READING: Air pollution</p> |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- Making notes: organizing recording, and remembering important information
- Interpreting meaning; recognizing fact and speculation

WRITING Technology - good or bad?

- Organizing ideas (1): planning the arguments for and against
- Linking ideas (2): first, for instance, in conclusion ... Writing a discursive essay

People: past and present

READING: Three famous writers

- Using original sources: dealing with difficult language and unknown vocabulary

WRITING: Trends

- Paraphrasing and summarizing: using other sources
- Writing a summary

The world of IT:

READING: Computers

- Rephrasing and explaining; dealing with difficult scientific and technological words
- Avoiding repetition (2): pronouns and what they refer to

WRITING: IT - benefits and drawbacks

- Linking ideas (3): cause and result Coherent writing; writing up notes
- Writing from notes

Inventions, discoveries, and processes:

READING: How things work

- Intensive reading: strategies for focusing your reading
- Linking ideas (4); sequencing words to describe a process

WRITING How things are made

- The passive voice; writing in neutral style
- Clarifying a sequence: describing a process

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Writing a description of a process</li> </ul> <p>Travel and tourism:</p> <p>READING: International tourism</p> <ul style="list-style-type: none"> <li>• Interpreting data: statistical information in graphs, charts, and texts</li> </ul> <p>VOCABULARY DEVELOPMENT Varying vocabulary (2)</p> <ul style="list-style-type: none"> <li>• A voiding repetition (3): describing graphs using synonyms, adjectives + nouns, verbs + adverbs</li> </ul> |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>For Teachers:</p> <ol style="list-style-type: none"> <li><b>17. Interactive and Communicative Approach:</b> Encourage students to engage in meaningful conversations, discussions, and role-plays. This approach emphasizes real-life communication and helps students practice using English in different contexts.</li> <li><b>18. Error Correction:</b> Provide constructive feedback on students' errors without discouraging them. Focus on correcting essential mistakes that hinder communication while praising their efforts to build confidence.</li> <li><b>19. Contextual Learning:</b> Use authentic materials like articles, videos, and short stories to introduce new vocabulary and grammar in relevant contexts. This helps students understand language usage in real-life situations.</li> <li><b>20. Task-Based Learning:</b> Design activities and tasks that require students to use English to complete meaningful projects or solve problems. This approach fosters critical thinking and language application skills.</li> <li><b>21. Grammar in Context:</b> Teach grammar points within the context of authentic texts or dialogues. This helps students see how grammar functions in real communication rather than just learning rules in isolation.</li> </ol> |

22. **Encourage Reading:** Assign reading materials suited to the students' proficiency level. Reading improves vocabulary, comprehension, and exposes students to different writing styles.
23. **Listening Practice:** Provide opportunities for listening exercises, such as watching English-language videos, movies, or podcasts. This enhances listening skills and exposes students to different accents and speech patterns.
24. **Writing Practice:** Assign writing tasks like essays, emails, or short stories. Provide feedback on their writing to improve their skills gradually.

For Students:

17. **Consistent Practice:** Regularly practice reading, writing, listening, and speaking in English. Consistency is crucial for improvement.
18. **Use Language Apps and Online Resources:** Utilize language learning apps and online resources to reinforce learning, expand vocabulary, and improve grammar.
19. **Join Language Exchange Groups:** Engage in language exchange programs or groups where you can practice speaking English with native speakers or other learners.
20. **Set Goals:** Establish clear language learning goals and track your progress. Celebrate achievements and milestones.
21. **Immerse Yourself:** Surround yourself with English as much as possible. Watch English movies, TV shows, and listen to English music or podcasts.
22. **Keep a Language Journal:** Write down new words, expressions, and grammar rules you learn. Review and practice them regularly.
23. **Practice with Different Media:** Practice English through various mediums like reading books, watching documentaries, listening to news, or participating in online forums.
24. **Be Patient and Persistent:** Language learning takes time and effort. Stay motivated and persistent even if you encounter challenges

### Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعاً

|                                                                                |    |                                                                           |     |
|--------------------------------------------------------------------------------|----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 33 | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 2   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 42 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 2.8 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 75 |                                                                           |     |

| Module Evaluation     |              |             |                  |          |                           |
|-----------------------|--------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية |              |             |                  |          |                           |
|                       |              | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment  | Quizzes      | 2           | 10% (10)         | 5 and 10 | LO #1, #2 and #10,        |
|                       | Assignments  | 2           | 10% (10)         | 2 and 12 | LO #3, #4 and #6, #7      |
|                       | Report       | 1           | 20% (10)         | 13       | LO #5, #8 and #10         |
| Summative assessment  | Midterm Exam | 2hr         | 10% (10)         | 7        | LO #1 - #7                |
|                       | Final Exam   | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment      |              |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                  |
|---------------------------------|------------------|
| المنهاج الأسبوعي النظري         |                  |
|                                 | Material Covered |

|                |                                        |
|----------------|----------------------------------------|
| <b>Week 1</b>  | International student                  |
| <b>Week 2</b>  | Where in the world                     |
| <b>Week 3</b>  | Newspaper articles                     |
| <b>Week 4</b>  | Conferences and visits                 |
| <b>Week 5</b>  | Science and our world                  |
| <b>Week 6</b>  | Midterm exam                           |
| <b>Week 7</b>  | People: past and present               |
| <b>Week 8</b>  | The world of IT                        |
| <b>Week 9</b>  | Inventions, discoveries, and processes |
| <b>Week 10</b> | Travel and tourism                     |
| <b>Week 11</b> | Final exam                             |

| <b>Learning and Teaching Resources</b><br><b>مصادر التعلم والتدريس</b> |                                                                                                              |                                  |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|----------------------------------|
|                                                                        | <b>Text</b>                                                                                                  | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                                  | Sarah Philpot. Headway: Academic skills- reading, writing, and study skills. LEVEL 2 Student's Book. Oxford. | Yes                              |
| <b>Recommended Texts</b>                                               |                                                                                                              |                                  |
| <b>Websites</b>                                                        |                                                                                                              |                                  |

| <b>Grading Scheme</b><br><b>مخطط الدرجات</b> |
|----------------------------------------------|
|----------------------------------------------|

| Group                              | Grade                   | التقدير             | Marks %  | Definition                            |
|------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| <b>Success Group</b><br>(50 - 100) | <b>A</b> - Excellent    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                    | <b>B</b> - Very Good    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                                    | <b>C</b> – Good         | جيد                 | 70 - 79  | Sound work with notable errors        |
|                                    | <b>D</b> – Satisfactory | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                                    | <b>E</b> - Sufficient   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)      | <b>FX</b> – Fail        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                    | <b>F</b> – Fail         | راسب                | (0-44)   | Considerable amount of work required  |
|                                    |                         |                     |          |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Curriculum for the third Year, First Semester.

### Module 1

#### MODULE DESCRIPTION FORM

#### نموذج وصف المادة الدراسية

| Module Information      |                              |                                                                                                                                                                                                                                          |
|-------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية |                              |                                                                                                                                                                                                                                          |
| Module Title            | <b>Advanced Cryptography</b> | Module Delivery                                                                                                                                                                                                                          |
| Module Type             | Core                         | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |
| Module Code             | CyB304                       |                                                                                                                                                                                                                                          |
| ECTS Credits            | 4                            |                                                                                                                                                                                                                                          |
| SWL (hr/sem)            | 100                          |                                                                                                                                                                                                                                          |

|                                    |                     |                               |                   |
|------------------------------------|---------------------|-------------------------------|-------------------|
| Module Level                       | 4                   | Semester of Delivery          | 1                 |
| Administering Department           | Type Dept. Code     | College                       | Type College Code |
| Module Leader                      | Name                | e-mail                        | E-mail            |
| Module Leader's Acad. Title        | Professor           | Module Leader's Qualification | Ph.D.             |
| Module Tutor                       | Name (if available) | e-mail                        | E-mail            |
| Peer Reviewer Name                 | Name                | e-mail                        | E-mail            |
| Scientific Committee Approval Date | 15/09/2025          | Version Number                | 1.0               |

|                                                                         |      |          |  |
|-------------------------------------------------------------------------|------|----------|--|
| <b>Relation with other Modules</b><br>العلاقة مع المواد الدراسية الأخرى |      |          |  |
| Prerequisite module                                                     | None | Semester |  |
| Co-requisites module                                                    | None | Semester |  |

|                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Module Aims</b><br>أهداف المادة الدراسية                                                                               | This course provides students with the most common cryptographic algorithms and protocols and how to use cryptographic algorithms and protocols to secure distributed applications and computer networks: <ul style="list-style-type: none"> <li>• Explain the objectives of information security.</li> <li>• Explain the importance and application of each of confidentiality, integrity, authentication and availability.</li> <li>• Understand various cryptographic algorithms.</li> <li>• Understand the basic categories of threats to computers and networks.</li> </ul>     |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية                                                          | By the end of the course, students will be able to: <ul style="list-style-type: none"> <li>• Understand the Cryptography principles and types.</li> <li>• Describe the computer systems security issues.</li> <li>• Student will be able to understand basic cryptographic algorithms, message and security issues.</li> <li>• Ability to identify information system requirements for both of them, such as, client and server.</li> <li>• Ability to understand the current issues towards information security.</li> <li>• Apply security principles to system design.</li> </ul> |
| <b>Indicative Contents</b>                                                                                                | <ul style="list-style-type: none"> <li>• Block Ciphers and the Data Encryption Standard.</li> <li>- Block Cipher Principles.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                              |

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| المحتويات الإرشادية | <ul style="list-style-type: none"> <li>- Differential and Linear Cryptanalysis.</li> <li>- Block Cipher Modes of Operation.</li> <li>• Advanced Encryption Standard.</li> <li>• Stream Cipher.</li> <li>• Asymmetric Ciphering: Public Key Cryptography, RSA.</li> <li>• Asymmetric Ciphering: Public Key Cryptography, Diffie-Hellman Key Exchange.</li> <li>• Asymmetric Ciphering: Public Key Cryptography, Elgamal Cryptographic system.</li> <li>• Asymmetric Ciphering: Public Key Cryptography, Elliptic Curve Cryptography.</li> <li>• Asymmetric Ciphering: Public Key Cryptography, Diffie-Hellman Key Exchange.</li> <li>• Cryptography Data Integrity: Hash Function.</li> <li>• Cryptography Data Integrity: Two Simple Hash Function.</li> <li>• Cryptography Data Integrity: Secure Hash Algorithm (SHA-3).</li> <li>• Cryptography Data Integrity: Message Authentication Codes.</li> <li>• Digital Signature: Elgamal Digital Signature Scheme.</li> <li>• Digital Signature: Schnorr Digital Signature Scheme + NIST DSS.</li> <li>• Digital Signature: Elliptic Curve Digital Signature Scheme.</li> <li>• Digital Signature: RSA-PSS Digital Signature Scheme.</li> </ul> |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Learning and Teaching Strategies            |                                                                                                                                                                                                                                                                                                                                                                                                                    |                                          |  |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--|
| استراتيجيات التعلم والتعليم                 |                                                                                                                                                                                                                                                                                                                                                                                                                    |                                          |  |
| Strategies                                  | Type something like: The main strategy that will be adopted in delivering this module is to encourage students’ participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students. |                                          |  |
| Student Workload (SWL)                      |                                                                                                                                                                                                                                                                                                                                                                                                                    |                                          |  |
| الحمل الدراسي للطالب                        |                                                                                                                                                                                                                                                                                                                                                                                                                    |                                          |  |
| Structured SWL (h/sem)                      | 45                                                                                                                                                                                                                                                                                                                                                                                                                 | Structured SWL (h/w)                     |  |
| الحمل الدراسي المنتظم للطالب خلال الفصل     |                                                                                                                                                                                                                                                                                                                                                                                                                    | الحمل الدراسي المنتظم للطالب أسبوعيا     |  |
| Unstructured SWL (h/sem)                    | 55                                                                                                                                                                                                                                                                                                                                                                                                                 | Unstructured SWL (h/w)                   |  |
| الحمل الدراسي غير المنتظم للطالب خلال الفصل |                                                                                                                                                                                                                                                                                                                                                                                                                    | الحمل الدراسي غير المنتظم للطالب أسبوعيا |  |
| Total SWL (h/sem)                           | 100                                                                                                                                                                                                                                                                                                                                                                                                                |                                          |  |
| الحمل الدراسي الكلي للطالب خلال الفصل       |                                                                                                                                                                                                                                                                                                                                                                                                                    |                                          |  |

## Module Evaluation

تقييم المادة الدراسية

|                      |              | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
|----------------------|--------------|-------------|------------------|----------|---------------------------|
| Formative assessment | Quizzes      | 3           | 24% (24)         | 3,6,9    | LO #1, 2, 10 and 11       |
|                      | Assignments  | 2           | 6% (6)           | 2, 12    | LO # 3, 4, 6 and 7        |
|                      | Projects     | 5           | 5%(5)            | 4        | Continuous                |
|                      | Report       | 1           | 5% (5)           | 13       | LO # 5, 8 and 10          |
| Summative assessment | Midterm Exam | 1 hr        | 10% (10)         | 7        | LO # 1-7                  |
|                      | Final Exam   | 2 hr        | 50% (50)         | 16       | All                       |
| Total assessment     |              |             | 100% (100 Marks) |          |                           |

## Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

|         | Material Covered                                                           |
|---------|----------------------------------------------------------------------------|
| Week 1  | Block Ciphers and the Data Encryption Standard.                            |
| Week 2  | Data Encryption Standard.                                                  |
| Week 3  | Avalanche Effect.                                                          |
| Week 4  | Modes of Operation: CTR.                                                   |
| Week 5  | Rijndael Cipher.                                                           |
| Week 6  | AES Key Expansion.                                                         |
| Week 7  | Stream Cipher.                                                             |
| Week 8  | Asymmetric Ciphery: Public Key Cryptography, RSA.                          |
| Week 9  | Asymmetric Ciphery: Public Key Cryptography, Diffie-Hellman Key Exchange.  |
| Week 10 | Asymmetric Ciphery: Public Key Cryptography, Elgamal Cryptographic system. |
| Week 11 | Asymmetric Ciphery: Public Key Cryptography, Elliptic Curve Cryptography.  |
| Week 12 | Asymmetric Ciphery: Public Key Cryptography, Diffie-Hellman Key Exchange.  |
| Week 13 | Cryptography Data Integrity: Hash Function.                                |
| Week 14 | Cryptography Data Integrity: Two Simple Hash Function.                     |
| Week 15 | Cryptography Data Integrity: Message Authentication Codes.                 |
| Week 16 | Preparatory week before the final Exam.                                    |

## Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|        | Material Covered |
|--------|------------------|
| Week 1 | لا يوجد مختبر    |
| Week 2 |                  |
| Week 3 |                  |
| Week 4 |                  |
| Week 5 |                  |
| Week 6 |                  |
| Week 7 |                  |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                   | Text                                                                                                                                                                                       | Available in the Library? |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Required Texts    | <b>William Stallings, "Cryptography and Network Security. Principle and Practice", Fourth Edition, Principle Hall, USA, 2006.</b>                                                          | No                        |
| Recommended Texts | <b><a href="#">Alfred J. Menezes</a>, <a href="#">Paul C. van Oorschot</a> and <a href="#">Scott A. Vanstone</a>, "Handbook of Applied Cryptography", Fifth Edition , CRC Press, 2001.</b> | No                        |
| Websites          |                                                                                                                                                                                            |                           |

## Grading Scheme

مخطط الدرجات

| Group                       | Grade            | التقدير             | Marks (%) | Definition                            |
|-----------------------------|------------------|---------------------|-----------|---------------------------------------|
| Success Group<br>(50 - 100) | A - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                             | B - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                             | C – Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                             | D - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                             | E - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)      | FX – Fail        | راسب (قيد المعالجة) | (45-49)   | More work required but credit awarded |
|                             | F – Fail         | راسب                | (0-44)    | Considerable amount of work required  |
|                             |                  |                     |           |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 2

### MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| Module Information                 |                     |                               |                                                                                                                                                                                                                                                                                                                          |
|------------------------------------|---------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                     |                               |                                                                                                                                                                                                                                                                                                                          |
| Module Title                       | Website security    |                               | Module Delivery                                                                                                                                                                                                                                                                                                          |
| Module Type                        | Core                |                               | <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Theory</li> <li><input checked="" type="checkbox"/> Lecture</li> <li><input type="checkbox"/> Lab</li> <li><input type="checkbox"/> Tutorial</li> <li><input type="checkbox"/> Practical</li> <li><input type="checkbox"/> Seminar</li> </ul> |
| Module Code                        | CyB                 |                               |                                                                                                                                                                                                                                                                                                                          |
| ECTS Credits                       | 5                   |                               |                                                                                                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 125                 |                               |                                                                                                                                                                                                                                                                                                                          |
| Module Level                       | 2                   | Semester of Delivery          | 1                                                                                                                                                                                                                                                                                                                        |
| Administering Department           | CyB                 | College                       | CSIS                                                                                                                                                                                                                                                                                                                     |
| Module Leader                      |                     | e-mail                        |                                                                                                                                                                                                                                                                                                                          |
| Module Leader's Acad. Title        | Assist lect         | Module Leader's Qualification | PHD                                                                                                                                                                                                                                                                                                                      |
| Module Tutor                       | Name (if available) | e-mail                        | E-mail                                                                                                                                                                                                                                                                                                                   |
| Peer Reviewer Name                 | Name                | e-mail                        | E-mail                                                                                                                                                                                                                                                                                                                   |
| Scientific Committee Approval Date |                     | Version Number                | 1.0                                                                                                                                                                                                                                                                                                                      |

### Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

|                      |      |          |  |
|----------------------|------|----------|--|
| Prerequisite module  | None | Semester |  |
| Co-requisites module |      | Semester |  |

### Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b><br>أهداف المادة الدراسية                | 36. Understand the fundamental concepts and importance of web security.<br>37. Identify common web application threats and vulnerabilities (such as XSS, SQL Injection, CSRF).<br>38. Explain how attackers exploit weaknesses in web applications.<br>39. Understand the role of authentication, authorization, and session management in securing web systems.<br>40. Apply secure coding practices to reduce security risks in web applications.<br>41. Recognize the importance of input validation and output encoding.<br>42. Understand security mechanisms such as HTTPS, SSL/TLS, and secure cookies.<br>43. Use basic security tools and techniques to identify and mitigate web security issues. |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية | 19. Describe the core principles and concepts of web security.<br>20. Identify and classify common web application vulnerabilities and attacks.<br>21. Analyze how security flaws arise in web applications and how they can be exploited.<br>22. Implement basic security controls for authentication, authorization, and session management.<br>23. Apply secure coding practices to prevent common web-based attacks.<br>24. Evaluate the effectiveness of web security mechanisms such as HTTPS,                                                                                                                                                                                                        |

|                                                              |                                                                                                                              |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
|                                                              | <p>SSL/TLS, and cookies.</p> <p>25. Use security tools to detect, analyze, and mitigate web application vulnerabilities.</p> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p> |                                                                                                                              |

| <p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Strategies</b></p>                                                          | <p>Implement secure coding standards and follow best practices during web application development.</p> <p>Apply input validation and output encoding to prevent injection attacks.</p> <p>Use strong authentication and authorization mechanisms to control user access.</p> <p>Enforce HTTPS and proper SSL/TLS configuration to protect data in transit.</p> <p>Regularly update and patch web servers, frameworks, and libraries.</p> <p>Conduct vulnerability assessments and penetration testing on web applications.</p> <p>Deploy security tools such as Web Application Firewalls (WAF) to monitor and block attacks.</p> <p>Apply the principle of least privilege to users and system components.</p> <p>Perform regular security audits and continuous monitoring of web systems.</p> <p>Educate developers and users about web security threats and safe practice</p> |

| <p><b>Student Workload (SWL)</b></p> <p>الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا</p> |    |                                                                                |     |
|-------------------------------------------------------------------------------------|----|--------------------------------------------------------------------------------|-----|
| <p><b>Structured SWL (h/sem)</b></p> <p>الحمل الدراسي المنتظم للطلاب خلال الفصل</p> | 62 | <p><b>Structured SWL (h/w)</b></p> <p>الحمل الدراسي المنتظم للطلاب أسبوعيا</p> | 4.1 |

|                                                                                |            |                                                                           |     |
|--------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------|-----|
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 63         | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 4.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | <b>125</b> |                                                                           |     |

| Module Evaluation<br>تقييم المادة الدراسية |                 |             |                  |          |                           |
|--------------------------------------------|-----------------|-------------|------------------|----------|---------------------------|
|                                            |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment                       | Quizzes         | 2           | 10% (10)         | 5 and 10 | All                       |
|                                            | Assignments     | 2           | 20% (20)         | 2 and 12 | LO #2, #4 and #5, #8      |
|                                            | Projects / Lab. | -           | -                | -        | -                         |
|                                            | Report          | 1           | 10% (10)         | 13       | LO #1, #3, #6 and #7      |
| Summative assessment                       | Midterm Exam    | 2hr         | 10% (10)         | 7        | All                       |
|                                            | Final Exam      | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment                           |                 |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus)<br>المنهاج الاسبوعي النظري |                                         |
|------------------------------------------------------------|-----------------------------------------|
|                                                            | Material Covered                        |
| Week 1                                                     | Introduction to Web Security            |
| Week 2                                                     | Architecture of Modern Web Applications |

|                |                                                                 |
|----------------|-----------------------------------------------------------------|
| <b>Week 3</b>  | Web Attacks                                                     |
| <b>Week 4</b>  | Injection Attacks.                                              |
| <b>Week 5</b>  | Cross-Site Scripting (XSS)                                      |
| <b>Week 6</b>  | CSRF and Session Hijacking                                      |
| <b>Week 7</b>  | Authentication and Identity Attacks                             |
| <b>Week 8</b>  | API Security                                                    |
| <b>Week 9</b>  | Access Control and Authorization                                |
| <b>Week 10</b> | Database and Data Storage Security                              |
| <b>Week 11</b> | Web Application Firewalls (WAF) & Content Security Policy (CSP) |
| <b>Week 12</b> | Server and Infrastructure Security                              |
| <b>Week 13</b> | Governance, Risk, and Compliance (GRC)                          |
| <b>Week 14</b> | Final Projects and Presentations                                |
| <b>Week 15</b> | Final Projects and Presentations                                |
| <b>Week 16</b> | Exam                                                            |

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                               |                                  |
|-----------------------------------------------------------------|-----------------------------------------------|----------------------------------|
|                                                                 | <b>Text</b>                                   | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                           | <b>Cyber Risk Resources for Practitioners</b> |                                  |
| <b>Recommended Texts</b>                                        |                                               |                                  |
| <b>Websites</b>                                                 |                                               |                                  |

| Grading Scheme                                                                                                                                                                                                                                                                                                                                                                       |                  |                     |          |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|----------|---------------------------------------|
| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                                         |                  |                     |          |                                       |
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks %  | Definition                            |
| <b>Success Group</b><br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                   | A – Excellent    | امتياز              | 90 – 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | B - Very Good    | جيد جدا             | 80 – 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | C – Good         | جيد                 | 70 – 79  | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | D - Satisfactory | متوسط               | 60 – 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | E – Sufficient   | مقبول               | 50 – 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                        | FX – Fail        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | F – Fail         | راسب                | (0-44)   | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                  |                     |          |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                  |                     |          |                                       |

## Module 3

### MODULE DESCRIPTION FORM

#### نموذج وصف المادة الدراسية

| Module Information      |                                |                                                                                                                                          |
|-------------------------|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية |                                |                                                                                                                                          |
| Module Title            | <b>Artificial Intelligence</b> | Module Delivery                                                                                                                          |
| Module Type             | Basic                          | <input type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial |
| Module Code             | CyB305                         |                                                                                                                                          |
| ECTS Credits            | 125                            |                                                                                                                                          |

|                                    |                           |                                                                        |                                                        |
|------------------------------------|---------------------------|------------------------------------------------------------------------|--------------------------------------------------------|
| SWL (hr/sem)                       | 3                         | <input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                        |
| Module Level                       |                           | Semester of Delivery                                                   |                                                        |
| Administering Department           | Cyber security department | College                                                                | Collage of computer science and information technology |
| Module Leader                      | Athman Dhiya Abdulsatar   | e-mail                                                                 |                                                        |
| Module Leader's Acad. Title        | Assistant lecturer        | Module Leader's Qualification                                          | Master degree                                          |
| Module Tutor                       | Athman Dhiya Abdulsatar   | e-mail                                                                 | Athman.dhiya@uobasrah.edu.iq                           |
| Peer Reviewer Name                 | Athman Dhiya Abdulsatar   | e-mail                                                                 | Athmanabdulsatar@gmail.com                             |
| Scientific Committee Approval Date |                           | Version Number                                                         | 07726259220                                            |

### Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

|                      |  |          |  |
|----------------------|--|----------|--|
| Prerequisite module  |  | Semester |  |
| Co-requisites module |  | Semester |  |

### Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Aims</b><br>أهداف المادة الدراسية | <ul style="list-style-type: none"> <li>Explain the foundations, history, and applications of AI.</li> <li>Model intelligent agents and apply problem-solving and search strategies.</li> <li>Implement adversarial search and logical reasoning methods.</li> <li>Apply probabilistic reasoning, planning, and decision-making under uncertainty.</li> <li>Understand key machine learning techniques and neural networks.</li> <li>Explore applications in NLP, computer vision, and robotics.</li> <li>Evaluate the ethical and societal impacts of AI.</li> </ul> |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>1. Explain the foundations, history, evolution, and real-world applications of artificial intelligence.</li> <li>2. Describe intelligent agents, their architectures, environments, and performance evaluation.</li> <li>3. Apply search and problem-solving techniques, including uninformed, informed, and adversarial search.</li> <li>4. Represent knowledge and perform logical and probabilistic reasoning under uncertainty.</li> <li>5. Implement machine learning models, including supervised, unsupervised, and neural networks.</li> <li>6. Demonstrate understanding of AI applications in NLP, computer vision, and robotics.</li> <li>7. Analyze ethical, safety, fairness, privacy, and societal impacts of AI technologies.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <ul style="list-style-type: none"> <li>• <b>Foundations of AI</b> – Definition, history, evolution, and applications.</li> <li>• <b>Intelligent Agents</b> – Architectures, environments, rationality, and performance measures.</li> <li>• <b>Problem-Solving &amp; Search</b> – Uninformed search (BFS, DFS, UCS) and informed search (Greedy, A*).</li> <li>• <b>Adversarial Search</b> – Game playing, Minimax, and Alpha-Beta pruning.</li> <li>• <b>Knowledge Representation &amp; Reasoning</b> – Propositional logic, first-order logic, inference methods.</li> <li>• <b>Reasoning under Uncertainty</b> – Probability, Bayesian networks, Hidden Markov models.</li> <li>• <b>Planning</b> – Classical planning (STRIPS, forward/backward search, partial-order planning).</li> <li>• <b>Machine Learning</b> – Supervised vs. unsupervised learning, decision trees, clustering, dimensionality reduction.</li> <li>• <b>Artificial Neural Networks</b> – Perceptrons, multilayer networks, backpropagation.</li> <li>• <b>Advanced Applications</b> – Basics of NLP, computer vision, and robotics.</li> <li>• <b>Ethics &amp; Societal Impact</b> – Fairness, safety, transparency, privacy, and global implications of AI.</li> </ul> |

| <p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p> |                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Strategies</b></p>                                                          | <ul style="list-style-type: none"> <li>• <b>Lectures &amp; Interactive Discussions</b> – Introduce AI foundations, algorithms, and applications with real-world examples and class debates.</li> <li>• <b>Problem-Solving Sessions</b> – In-class exercises on search, logic, probability, and planning to strengthen analytical skills.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"> <li>• <b>Hands-on Labs &amp; Tutorials</b> – Implement AI algorithms (e.g., BFS, A*, decision trees, neural networks) using Python or related tools.</li> <li>• <b>Quizzes &amp; Assignments</b> – Short assessments to reinforce key ideas and encourage continuous learning.</li> <li>• <b>Case Studies &amp; Applications</b> – Analyze real-world AI systems in healthcare, NLP, robotics, and computer vision.</li> <li>• <b>Group Projects / Mini-Projects</b> – Collaborative work on designing and presenting a small AI application.</li> <li>• <b>Seminars &amp; Reflection</b> – Discussions on ethical, social, and global impacts of AI.</li> </ul> |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب                          |  |                                                                           |  |
|--------------------------------------------------------------------------------|--|---------------------------------------------------------------------------|--|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       |  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       |  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل |  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا |  |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              |  |                                                                           |  |

| <b>Module Evaluation</b><br>تقييم المادة الدراسية |                     |             |                |            |                           |
|---------------------------------------------------|---------------------|-------------|----------------|------------|---------------------------|
|                                                   |                     | Time/Number | Weight (Marks) | Week Due   | Relevant Learning Outcome |
| <b>Formative assessment</b>                       | <b>Quizzes</b>      | 1           | 10             | Week 5     |                           |
|                                                   | <b>Assignments</b>  | 2           | 10             | Week 2 & 7 |                           |
|                                                   | <b>Seminar</b>      | 1           | 10             | Week 12    |                           |
|                                                   | <b>Report</b>       | 1           | 10             | Week 13    |                           |
| <b>Summative assessment</b>                       | <b>Midterm Exam</b> | 1           | 10             | Week 8     |                           |
|                                                   | <b>Final Exam</b>   | 1           | 50             |            |                           |
| <b>Total assessment</b>                           |                     |             | 100            |            |                           |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الأسبوعي النظري |                         |
|-------------------------------------------------------------------|-------------------------|
|                                                                   | <b>Material Covered</b> |

|                |                                                                                                                                                                                          |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 1</b>  | <ul style="list-style-type: none"> <li>• Introduction to Artificial Intelligence</li> <li>• Definition, history, and evolution of AI</li> <li>• Real-world applications of AI</li> </ul> |
| <b>Week 2</b>  | <ul style="list-style-type: none"> <li>• Intelligent Agents</li> <li>• Agent architectures and environments</li> <li>• Performance measures and rationality</li> </ul>                   |
| <b>Week 3</b>  | <ul style="list-style-type: none"> <li>• Problem Solving with Search</li> <li>• Uninformed search strategies: BFS, DFS, Uniform-Cost Search</li> </ul>                                   |
| <b>Week 4</b>  | <ul style="list-style-type: none"> <li>• Informed Search Strategies</li> <li>• Greedy Search, A* Algorithm</li> <li>• Heuristics and optimization in search</li> </ul>                   |
| <b>Week 5</b>  | <ul style="list-style-type: none"> <li>• Adversarial Search</li> <li>• Game playing, Minimax algorithm</li> <li>• □ Alpha-Beta pruning for efficiency</li> </ul>                         |
| <b>Week 6</b>  | <ul style="list-style-type: none"> <li>• Knowledge Representation I</li> <li>• Propositional logic</li> <li>• □ First-order logic: syntax and semantics</li> </ul>                       |
| <b>Week 7</b>  | <ul style="list-style-type: none"> <li>• Knowledge Representation II</li> <li>• Inference in first-order logic</li> <li>• Resolution and Unification</li> </ul>                          |
| <b>Week 8</b>  | <ul style="list-style-type: none"> <li>• Review + Midterm Exam</li> </ul>                                                                                                                |
| <b>Week 9</b>  | <ul style="list-style-type: none"> <li>• Reasoning under Uncertainty</li> <li>• Probability basics</li> <li>• Bayesian Networks</li> <li>• Hidden Markov Models</li> </ul>               |
| <b>Week 10</b> | <ul style="list-style-type: none"> <li>• Planning</li> <li>• STRIPS</li> <li>• Forward and backward state-space planning</li> <li>• Partial-order planning</li> </ul>                    |
| <b>Week 11</b> | <ul style="list-style-type: none"> <li>• Machine Learning I</li> <li>• Introduction to learning</li> <li>• Supervised learning</li> <li>• Decision trees</li> </ul>                      |
| <b>Week 12</b> | <ul style="list-style-type: none"> <li>• Machine Learning II</li> <li>• Unsupervised learning</li> </ul>                                                                                 |

|                |                                                                                                                                                                                                                |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | <ul style="list-style-type: none"> <li>• Clustering (k-means)</li> <li>• Dimensionality reduction</li> <li>• Artificial Neural Networks</li> </ul>                                                             |
| <b>Week 13</b> | <ul style="list-style-type: none"> <li>• Advanced Topics &amp; Applications</li> <li>• Introduction to Natural Language Processing (NLP)</li> <li>• Computer Vision</li> <li>• Overview of Robotics</li> </ul> |
| <b>Week 14</b> | <ul style="list-style-type: none"> <li>• Ethics and Future of AI</li> <li>• Safety, fairness, privacy, explainability, global impact</li> </ul>                                                                |
| <b>Week 15</b> | <ul style="list-style-type: none"> <li>• Review before Final Exam</li> </ul>                                                                                                                                   |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                  |
|-------------------------------------------------------------------------|------------------|
|                                                                         | Material Covered |
| <b>Week 1</b>                                                           |                  |
| <b>Week 2</b>                                                           |                  |
| <b>Week 3</b>                                                           |                  |
| <b>Week 4</b>                                                           |                  |
| <b>Week 5</b>                                                           |                  |
| <b>Week 6</b>                                                           |                  |
| <b>Week 7</b>                                                           |                  |
| <b>Week 8</b>                                                           |                  |

| <b>Learning and Teaching Resources</b><br>مصادر التعلم والتدريس |                                                                                                        |                           |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------|
|                                                                 | Text                                                                                                   | Available in the Library? |
| <b>Required Texts</b>                                           | Artificial Intelligence - A Modern Approach Fourth Edition by <i>Stuart Russell &amp; Peter Norvig</i> |                           |
| <b>Recommended Texts</b>                                        |                                                                                                        |                           |

|          |                                                                                                                                                     |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Websites | <a href="https://www.deeplearning.ai/short-courses/ai-python-for-beginners/">https://www.deeplearning.ai/short-courses/ai-python-for-beginners/</a> |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------|

| Grading Scheme<br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                       |                  |                     |           |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|-----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade            | التقدير             | Marks (%) | Definition                            |
| Success Group<br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                          | A - Excellent    | امتياز              | 90 - 100  | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | B - Very Good    | جيد جدا             | 80 - 89   | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | C - Good         | جيد                 | 70 - 79   | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | D - Satisfactory | متوسط               | 60 - 69   | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | E - Sufficient   | مقبول               | 50 - 59   | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                               | FX – Fail        | راسب (قيد المعالجة) | (45-49)   | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | F – Fail         | راسب                | (0-44)    | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                  |                     |           |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                  |                     |           |                                       |

## Module 4

### MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| Module Information<br>معلومات المادة الدراسية |                  |                      |                                                                                                                                                                                                                                          |  |  |  |
|-----------------------------------------------|------------------|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| Module Title                                  | Computer Network |                      | Module Delivery                                                                                                                                                                                                                          |  |  |  |
| Module Type                                   | Core             |                      | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |  |  |  |
| Module Code                                   | CYS301           |                      |                                                                                                                                                                                                                                          |  |  |  |
| ECTS Credits                                  | 6                |                      |                                                                                                                                                                                                                                          |  |  |  |
| SWL (hr/sem)                                  | 150              |                      |                                                                                                                                                                                                                                          |  |  |  |
| Module Level                                  | 3                | Semester of Delivery | 1                                                                                                                                                                                                                                        |  |  |  |
| Administering Department                      | CS               | College              | CSIS                                                                                                                                                                                                                                     |  |  |  |

|                                           |                       |                                      |                                |
|-------------------------------------------|-----------------------|--------------------------------------|--------------------------------|
| <b>Module Leader</b>                      | Dr. Khulood A. Nassar | <b>e-mail</b>                        | Khulood.nassar@uobasrah.edu.iq |
| <b>Module Leader's Acad. Title</b>        | Ass. Proof.           | <b>Module Leader's Qualification</b> | Ph.D.                          |
| <b>Module Tutor</b>                       | Name (if available)   | <b>e-mail</b>                        | E-mail                         |
| <b>Peer Reviewer Name</b>                 | Name                  | <b>e-mail</b>                        | E-mail                         |
| <b>Scientific Committee Approval Date</b> | 151/09/2025           | <b>Version Number</b>                | 1.0                            |

| Relation with other Modules       |      |                 |  |
|-----------------------------------|------|-----------------|--|
| العلاقة مع المواد الدراسية الأخرى |      |                 |  |
| <b>Prerequisite module</b>        | None | <b>Semester</b> |  |
| <b>Co-requisites module</b>       | None | <b>Semester</b> |  |

| Module Aims, Learning Outcomes and Indicative Contents   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Module Objectives</b><br>أهداف المادة الدراسية        | <ol style="list-style-type: none"> <li>1. Introduce students to the foundational concepts, principles, and terminology of computer network. This includes understanding the importance of communication and systems, networks, and the role of modern method of sending data.</li> <li>2. Familiarize students with various networks, standards, and best practices that are relevant to the field of communication devices. This includes understanding sending and receiving requirements, best protocols, and main goals of communication protocol.</li> <li>3. Explore the principles and techniques of network and communication system through standard systems.</li> <li>4. Provide students with knowledge of development practices and methodologies of data communication. This involves offering data transmission techniques.</li> <li>5. Introduce students to the fundamentals of computer network. This includes learning how to addressing, as well as investigations of this addressing methods and preserving variable them.</li> </ol> |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>1. Gain a comprehensive understanding of the fundamental concepts, principles, and terminology related to computer network, including the importance of data communication and systems.</li> <li>2. Demonstrate knowledge and comprehension of various addressing methods, standards, and best practices relevant to data communication, including sending and receiving requirements.</li> <li>3. Apply the principles and techniques of networks types, including understanding network architecture, communication protocols.</li> <li>4. Apply software development practices and methodologies, including understanding common software applications.</li> <li>5. Understand and apply the fundamentals of communication, including data transmission media.</li> <li>6. Apply the principles and protocols of communication, including understanding subnetting methods, management, and the role of subnet the network.</li> <li>7. Apply skills in managing networks, including understanding communication.</li> <li>8. Understand and apply considerations associated with data communication.</li> <li>9. Demonstrate awareness and understanding of emerging technologies and trends in data communication, including devices, and Internet.</li> </ol> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <p>Indicative content includes the following.</p> <ul style="list-style-type: none"> <li>• Module 1: Introduction to computer network. [12 hrs]</li> <li>• Module 2: addressing. [12 hrs]</li> <li>• Module 3: subnetting. [12 hrs]</li> <li>• Module 4: network layers system. [12 hrs]</li> <li>• Module 5: transmission data media. [12 hrs]</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| <p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p> |                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Strategies</b></p>                                                          | <p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.</p> |

|  |  |
|--|--|
|  |  |
|--|--|

| Student Workload (SWL)                                                         |     |                                                                           |   |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|---|
| الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا                                        |     |                                                                           |   |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 47  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 3 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 103 | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 150 |                                                                           |   |

| Module Evaluation     |                 |             |                  |            |                           |
|-----------------------|-----------------|-------------|------------------|------------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |            |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 10% (10)         | 5 and 10   | LO #1, #2 and #10, #11    |
|                       | Assignments     | 2           | 10% (10)         | 2 and 12   | LO #3, #4 and #6, #7      |
|                       | Projects / Lab. | 0           | 0% (0)           | Continuous | All                       |
|                       | Report          | 2           | 20% (20)         | 13         | LO #5, #8 and #10         |
| Summative assessment  | Midterm Exam    | 2hr         | 10% (10)         | 7          | LO #1 - #7                |
|                       | Final Exam      | 3hr         | 50% (50)         | 16         | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |            |                           |

| Delivery Plan (Weekly Syllabus) |                                       |
|---------------------------------|---------------------------------------|
| المنهاج الاسبوعي النظري         |                                       |
|                                 | Material Covered                      |
| Week 1                          | Introduction to computer network      |
| Week 2                          | Networks types                        |
| Week 3                          | Network devices                       |
| Week 4                          | Addressing                            |
| Week 5                          | Ip addressing                         |
| Week 6                          | Subnetting                            |
| Week 7                          | Masking and ranges                    |
| Week 8                          | Network layers model                  |
| Week 9                          | OSI model                             |
| Week 10                         | Mid exam                              |
| Week 11                         | TCP model and encapsulation operation |
| Week 12                         | Pysical media                         |
| Week 13                         | Wire media                            |
| Week 14                         | Optical fiber                         |
| Week 15                         | Wirless media                         |

| Delivery Plan (Weekly Lab. Syllabus) |                  |
|--------------------------------------|------------------|
| المنهاج الاسبوعي للمختبر             |                  |
|                                      | Material Covered |

|        |  |
|--------|--|
| Week 1 |  |
| Week 2 |  |
| Week 3 |  |
| Week 4 |  |
| Week 5 |  |
| Week 6 |  |
| Week 7 |  |

| Learning and Teaching Resources |                                                                                                                        |                           |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------|---------------------------|
| مصادر التعلم والتدريس           |                                                                                                                        |                           |
|                                 | Text                                                                                                                   | Available in the Library? |
| Required Texts                  | Fruize W. Bahroze, " Computer networki: Principles and Aritecture ", fifth Edition, Course Technology, New york, 2015. | No                        |
| Recommended Texts               | Peter L. Dordol . " An Introduction to Computer Networks "F Six Edition ,Printice Hill, 2022                           | No                        |
| Websites                        |                                                                                                                        |                           |

| Grading Scheme              |               |         |          |                                |
|-----------------------------|---------------|---------|----------|--------------------------------|
| مخطط الدرجات                |               |         |          |                                |
| Group                       | Grade         | التقدير | Marks %  | Definition                     |
| Success Group<br>(50 - 100) | A - Excellent | امتياز  | 90 - 100 | Outstanding Performance        |
|                             | B - Very Good | جيد جدا | 80 - 89  | Above average with some errors |
|                             | C – Good      | جيد     | 70 - 79  | Sound work with notable errors |

|            |                  |                     |         |                                       |
|------------|------------------|---------------------|---------|---------------------------------------|
|            | D – Satisfactory | متوسط               | 60 - 69 | Fair but with major shortcomings      |
|            | E - Sufficient   | مقبول               | 50 - 59 | Work meets minimum criteria           |
| Fail Group | FX – Fail        | راسب (قيد المعالجة) | (45-49) | More work required but credit awarded |
| (0 – 49)   | F – Fail         | راسب                | (0-44)  | Considerable amount of work required  |
|            |                  |                     |         |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 5

### MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

| Module Information          |                                    |                               |                                                                                                                                                                                                                                                                                                                          |  |
|-----------------------------|------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| معلومات المادة الدراسية     |                                    |                               |                                                                                                                                                                                                                                                                                                                          |  |
| Module Title                | <b>E-Commerce and its security</b> |                               | Module Delivery                                                                                                                                                                                                                                                                                                          |  |
| Module Type                 | Core                               |                               | <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Theory</li> <li><input checked="" type="checkbox"/> Lecture</li> <li><input type="checkbox"/> Lab</li> <li><input type="checkbox"/> Tutorial</li> <li><input type="checkbox"/> Practical</li> <li><input type="checkbox"/> Seminar</li> </ul> |  |
| Module Code                 | CyB306                             |                               |                                                                                                                                                                                                                                                                                                                          |  |
| ECTS Credits                | 4                                  |                               |                                                                                                                                                                                                                                                                                                                          |  |
| SWL (hr/sem)                | 60                                 |                               |                                                                                                                                                                                                                                                                                                                          |  |
| Module Level                | 3                                  | Semester of Delivery          | 1                                                                                                                                                                                                                                                                                                                        |  |
| Administering Department    | CyB                                | College                       | CSIS                                                                                                                                                                                                                                                                                                                     |  |
| Module Leader               |                                    | e-mail                        |                                                                                                                                                                                                                                                                                                                          |  |
| Module Leader's Acad. Title | Assist teacher                     | Module Leader's Qualification | PHD                                                                                                                                                                                                                                                                                                                      |  |

|                                           |                     |                       |        |
|-------------------------------------------|---------------------|-----------------------|--------|
| <b>Module Tutor</b>                       | Name (if available) | <b>e-mail</b>         | E-mail |
| <b>Peer Reviewer Name</b>                 | Name                | <b>e-mail</b>         | E-mail |
| <b>Scientific Committee Approval Date</b> |                     | <b>Version Number</b> | 1.0    |

### Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

|                             |        |                 |  |
|-----------------------------|--------|-----------------|--|
| <b>Prerequisite module</b>  | CYB109 | <b>Semester</b> |  |
| <b>Co-requisites module</b> | None   | <b>Semester</b> |  |

### Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b><br>أهداف المادة الدراسية | <ol style="list-style-type: none"> <li>1. To provide comprehensive understanding of e-commerce fundamentals, including concepts, evolution, and distinctions from traditional commerce.</li> <li>2. To examine various e-commerce business models and their applications in the modern digital economy.</li> <li>3. To analyze critical cybersecurity threats, privacy concerns, and ethical challenges in electronic transactions.</li> <li>4. To explore Electronic Data Interchange (EDI) systems for business-to-business communication and their impact on organizational efficiency.</li> <li>5. To investigate supply chain management principles and the integration of e-commerce technologies for operational optimization.</li> </ol> |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>1. Define e-commerce, compare it with traditional commerce, and evaluate its multi-dimensional advantages and disadvantages.</li> <li>2. Classify and differentiate between major e-commerce business models (B2B, B2C, C2C, C2B, B2G, G2B, G2C) with real-world examples.</li> <li>3. Identify security threats in e-commerce environments and propose appropriate cybersecurity measures and privacy protection strategies.</li> <li>4. Explain the functionality, benefits, and implementation challenges of Electronic Data Interchange (EDI) systems.</li> <li>5. Describe key components of supply chain management and analyze how e-commerce technologies enhance SCM effectiveness.</li> <li>6. Discuss ethical issues in digital commerce and frameworks for promoting responsible business practices.</li> <li>7. Evaluate historical developments and predict future trends in e-commerce and related technologies.</li> </ol>  |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                | <ol style="list-style-type: none"> <li>1. <b>E-Commerce Foundations:</b> Definitions, characteristics, historical development, traditional vs digital commerce comparison</li> <li>2. <b>Business Model Framework:</b> Detailed analysis of seven e-commerce models with practical applications</li> <li>3. <b>Cybersecurity in E-Commerce:</b> Security threats, protection measures, privacy risks, and data protection methods</li> <li>4. <b>Ethical Considerations:</b> Digital ethics frameworks, common ethical challenges, and compliance strategies</li> <li>5. <b>EDI Systems:</b> EDI processes, document types, implementation benefits, and technical challenges</li> <li>6. <b>Digital Supply Chains:</b> SCM components, technological integration, operational benefits, and management challenges</li> <li>7. <b>Risk Assessment:</b> Analysis of technical and non-technical disadvantages across organizational, consumer, and societal perspectives</li> </ol> |

|  |                                                                                                                                                                                                                                                                    |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>8. <b>Future Directions:</b> Emerging trends in e-commerce, cybersecurity, and supply chain innovation</p> <p>9. <b>Practical Applications:</b> Case studies, discussion topics, and real-world problem-solving exercises integrating all course components</p> |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p><b>1. Lecture &amp; Case Study Fusion</b><br/>Core theory taught through lectures is immediately applied using real-world e-commerce and cybersecurity case studies.</p> <p><b>2. Group Problem-Solving</b><br/>Small teams work on practical scenarios like designing security frameworks or troubleshooting EDI systems.</p> <p><b>3. Comparative Debates</b><br/>Structured debates contrast traditional vs. e-commerce, different business models, and technology trade-offs.</p> <p><b>4. Student-Led Discussions</b><br/>Students research and lead conversations on ethics and emerging trends to develop critical analysis skills.</p> <p><b>5. Synthesis Projects</b><br/>Practical assignments require integrating multiple course elements into cohesive e-commerce solutions.</p> <p><b>6. Digital Tools Integration</b><br/>LMS platforms and simulation software provide hands-on experience with relevant technologies.</p> <p><b>7. Continuous Feedback Loop</b><br/>Regular constructive feedback and reflection prompts connect all course components to cybersecurity practice.</p> |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعاً |
|---------------------------------------------------------------------------|
|---------------------------------------------------------------------------|

|                                                                                |            |                                                                           |  |
|--------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------|--|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 60         | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       |  |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 63         | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا |  |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | <b>125</b> |                                                                           |  |

| Module Evaluation     |                 |             |                  |          |                           |
|-----------------------|-----------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |          |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 10% (10)         | 5 and 10 | All                       |
|                       | Assignments     | 2           | 20% (20)         | 2 and 12 | LO #2, #4 and #5, #8      |
|                       | Projects / Lab. | -           | -                | -        | -                         |
|                       | Report          | 1           | 10% (10)         | 13       | LO #1, #3, #6 and #7      |
| Summative assessment  | Midterm Exam    | 2hr         | 10% (10)         | 7        | All                       |
|                       | Final Exam      | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                                                        |
|---------------------------------|------------------------------------------------------------------------|
| المنهاج الأسبوعي النظري         |                                                                        |
|                                 | Material Covered                                                       |
| Week 1                          | Introduction of E-Commerce (Definition, Key Characteristics, Examples) |
| Week 2                          | Traditional Commerce vs. E-Commerce                                    |

|                |                                                                                              |
|----------------|----------------------------------------------------------------------------------------------|
| <b>Week 3</b>  | Advantages (Organizations , Consumers, Society) and Disadvantages (Technical, Non_Technical) |
| <b>Week 4</b>  | Introduction of E-Commerce Business Models                                                   |
| <b>Week 5</b>  | Business-to-Business (B2B) and Business-to-Consumer (B2C)                                    |
| <b>Week 6</b>  | Consumer-to-Consumer (C2C) and Consumer-to-Business (C2B)                                    |
| <b>Week 7</b>  | Business-to-Government (B2G) and Government-to-Business (G2B)                                |
| <b>Week 8</b>  | Government-to-Citizen (G2C) and Questions and Discussion                                     |
| <b>Week 9</b>  | Security in E-Commerce( Definition, Security Threats ,Security Measures)                     |
| <b>Week 10</b> | Privacy in E-Commerce (Definition, ,Risks and Protecting Privacy)                            |
| <b>Week 11</b> | Ethical Issues in E-Commerce( Definition , Issues and Promoting Ethical)                     |
| <b>Week 12</b> | Electronic Data Interchange (EDI) (( Definition, Benefits Challenges,))                      |
| <b>Week 13</b> | EDI Document Types ( EDI Process Enterprise Resource Planning (ERP))                         |
| <b>Week 14</b> | Introduction of E-Commerce Supply Chain (Components ,Objectives)                             |
| <b>Week 15</b> | Benefits ,Technologies ,Challenges, Examples and Future Trends for Supply Chain              |
| <b>Week 16</b> | Exam                                                                                         |

| Learning and Teaching Resources |                                                                                                                            |                           |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------|---------------------------|
| مصادر التعلم والتدريس           |                                                                                                                            |                           |
|                                 | Text                                                                                                                       | Available in the Library? |
| Required Texts                  | <b>1. Laudon, K. C., &amp; Traver, C. G. (2023). <i>E-commerce: Business, Technology, Society</i> (17th ed.). Pearson.</b> | No                        |
| Recommended Texts               | <b>2. Schneider, G. P. (2022). <i>Electronic Commerce</i> (13th ed.). Cengage Learning.</b>                                | No                        |
| Websites                        |                                                                                                                            |                           |

## Grading Scheme

### مخطط الدرجات

| Group                              | Grade                   | التقدير             | Marks %  | Definition                            |
|------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| <b>Success Group</b><br>(50 - 100) | <b>A – Excellent</b>    | امتياز              | 90 – 100 | Outstanding Performance               |
|                                    | <b>B - Very Good</b>    | جيد جدا             | 80 – 89  | Above average with some errors        |
|                                    | <b>C – Good</b>         | جيد                 | 70 – 79  | Sound work with notable errors        |
|                                    | <b>D - Satisfactory</b> | متوسط               | 60 – 69  | Fair but with major shortcomings      |
|                                    | <b>E – Sufficient</b>   | مقبول               | 50 – 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)      | <b>FX – Fail</b>        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                    | <b>F – Fail</b>         | راسب                | (0-44)   | Considerable amount of work required  |
|                                    |                         |                     |          |                                       |

**Note:** Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

## Module 6

### MODULE DESCRIPTION FORM

### نموذج وصف المادة الدراسية

|                                  |                               |
|----------------------------------|-------------------------------|
| 1. Course Name:                  |                               |
|                                  | Mobile Applications           |
| 2. Course Code:                  |                               |
|                                  | CyB302                        |
| 3. Semester / Year:              |                               |
|                                  | 1 <sup>st</sup> Semester/2025 |
| 4. Description Preparation Date: |                               |
|                                  | 12/09/2025                    |

|                                                                     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                        |                          |
|---------------------------------------------------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------|--------------------------|
| 5. Available Attendance Forms:                                      |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                        |                          |
|                                                                     |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                        |                          |
| 6. Number of Credit Hours (Total) / Number of Units (Total)         |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                        |                          |
| 3                                                                   |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                        |                          |
| 7. Course administrator's name (mention all, if more than one name) |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                        |                          |
| Name: Dr. Sari Ali Sari<br>Email: sari.ali@uobasrah.edu.iq          |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                        |                          |
| 8. Email: Course Objectives                                         |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                        |                          |
| <b>Course Objectives</b>                                            |              | <ul style="list-style-type: none"> <li>• Introduce students to the fundamentals of mobile applications and platforms.</li> <li>• Train students to design and implement interactive mobile user interfaces.</li> <li>• Develop mobile applications using Android Studio or Flutter.</li> <li>• Integrate applications with databases and online APIs.</li> <li>• Enable students to create and present a complete mobile project.</li> </ul>                                                                                                                                                                                                                                         |                             |                        |                          |
| 9. Teaching and Learning Strategies                                 |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                        |                          |
| <b>Strategy</b>                                                     |              | <p><b>Lectures:</b> to introduce theoretical concepts and principles of mobile applications.</p> <p><b>Laboratory Sessions:</b> to provide hands-on experience in developing mobile applications.</p> <p><b>Tutorials:</b> to enhance problem-solving skills and provide guidance on projects.</p> <p><b>Group Projects:</b> to develop teamwork, communication, and practical development skills.</p> <p><b>Independent Study:</b> students are encouraged to use recommended texts, online documentation, and self-learning to deepen their understanding.</p> <p><b>Interactive Discussions:</b> to stimulate critical thinking and link theoretical knowledge with practice.</p> |                             |                        |                          |
| 10. Course Structure                                                |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                        |                          |
| <b>Week</b>                                                         | <b>Hours</b> | <b>Required Learning Outcomes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Unit or subject name</b> | <b>Learning method</b> | <b>Evaluation method</b> |

|                       |             |                                            |                                          |                     |                    |
|-----------------------|-------------|--------------------------------------------|------------------------------------------|---------------------|--------------------|
| 1                     | 3 (2T + 1L) | Understand mobile apps & platforms         | Introduction to Mobile Applications      | Lecture + Lab       | Quiz               |
| 2                     | 3 (2T + 1L) | Set up development environment & run app   | Development Environment                  | Lecture + Lab       | Lab exercise       |
| 3                     | 3 (2T + 1L) | Describe app architecture & lifecycle      | Mobile App Architecture                  | Lecture + Lab       | Quiz               |
| 4                     | 3 (2T + 1L) | Design simple UI                           | User Interface Design (Layouts, Widgets) | Lecture + Lab       | Assignment         |
| 5                     | 3 (2T + 1L) | Handle events & screen navigation          | Event Handling & Navigation              | Lecture + Lab       | Quiz               |
| 6                     | 3 (2T + 1L) | Implement local storage                    | Local Storage (Shared Prefs, SQLite)     | Lecture + Lab       | Lab work           |
| 7                     | 3 (2T + 1L) | Apply knowledge from Weeks 1–6             | Midterm Exam & Lab Test                  | Exam + Lab          | Midterm            |
| 8                     | 3 (2T + 1L) | Connect apps with APIs                     | Networking & APIs                        | Lecture + Lab       | Lab exercise       |
| 9                     | 3 (2T + 1L) | Work with multimedia & sensors             | Multimedia & Sensors                     | Lecture + Lab       | Assignment         |
| 10                    | 3 (2T + 1L) | Implement background tasks & notifications | Services & Notifications                 | Lecture + Lab       | Quiz               |
| 11                    | 3 (2T + 1L) | Design advanced UI/UX                      | Advanced UI/UX Design                    | Lecture + Lab       | Lab exercise       |
| 12                    | 3 (2T + 1L) | Apply testing & debugging                  | Testing & Debugging                      | Lecture + Lab       | Lab work           |
| 13                    | 3 (2T + 1L) | Prepare deployment                         | Deployment (APK, Publishing)             | Lecture + Lab       | Report             |
| 14                    | 3 (2T + 1L) | Present & evaluate projects                | Final Project Presentations              | Presentation        | Project evaluation |
| 15                    | 3 (2T + 1L) | Review & wrap-up                           | Revision and Q&A                         | Interactive session | Participation      |
| 11. Course Evaluation |             |                                            |                                          |                     |                    |

| Component                                                          | Details                                                                                                                                                                                                                                                          | Weight (Marks) | Percentage |
|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------|
| Continuous Assessment                                              | Quizzes (2)                                                                                                                                                                                                                                                      | 10             | 10%        |
|                                                                    | Assignments                                                                                                                                                                                                                                                      | 10             | 10%        |
|                                                                    | Lab Work / Practical Activities                                                                                                                                                                                                                                  | 10             | 10%        |
|                                                                    | Project / Group Work (Final Presentation)                                                                                                                                                                                                                        | 5              | 5%         |
|                                                                    | Report / Documentation                                                                                                                                                                                                                                           | 5              | 5%         |
| Midterm Exam                                                       |                                                                                                                                                                                                                                                                  | 10             | 10%        |
| Final Exam                                                         |                                                                                                                                                                                                                                                                  | 50             | 50%        |
| <b>12. Learning and Teaching Resources</b>                         |                                                                                                                                                                                                                                                                  |                |            |
| Required textbooks (curricular books, if any)                      | Android Programming: The Big Nerd Ranch Guide – Bill Phillips, Chris Stewart                                                                                                                                                                                     |                |            |
| Main references (sources)                                          | Neil Smyth – Android Studio Development Essentials – Java Edition, Payload Media, 2020.                                                                                                                                                                          |                |            |
| Recommended books and references (scientific journals, reports...) | Flutter for Beginners – Alessandro Biessek                                                                                                                                                                                                                       |                |            |
| Electronic References, Websites                                    | <ul style="list-style-type: none"> <li>Android Developer Guide: <a href="https://developer.android.com/guide">https://developer.android.com/guide</a></li> <li>Flutter Documentation: <a href="https://docs.flutter.dev">https://docs.flutter.dev</a></li> </ul> |                |            |

## Curriculum for the third Year, Second Semester.

### Module 1

#### MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

| Module Information      |                           |                 |
|-------------------------|---------------------------|-----------------|
| معلومات المادة الدراسية |                           |                 |
| Module Title            | Computer Network Security | Module Delivery |

|                                    |                       |                                                                                                                                                                                                                                          |                                                                                    |
|------------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Module Type                        | Core                  | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input type="checkbox"/> Lab<br><input type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                                                                                    |
| Module Code                        | CYB308                |                                                                                                                                                                                                                                          |                                                                                    |
| ECTS Credits                       | 6                     |                                                                                                                                                                                                                                          |                                                                                    |
| SWL (hr/sem)                       | 150                   |                                                                                                                                                                                                                                          |                                                                                    |
| Module Level                       | 3                     | Semester of Delivery                                                                                                                                                                                                                     | 1                                                                                  |
| Administering Department           | CS                    | College                                                                                                                                                                                                                                  | CSIS                                                                               |
| Module Leader                      | Dr. Khulood A. Nassar | e-mail                                                                                                                                                                                                                                   | <a href="mailto:Khulood.nassar@uobasrah.edu.iq">Khulood.nassar@uobasrah.edu.iq</a> |
| Module Leader's Acad. Title        | Ass. Proof.           | Module Leader's Qualification                                                                                                                                                                                                            | Ph.D.                                                                              |
| Module Tutor                       | Name (if available)   | e-mail                                                                                                                                                                                                                                   | E-mail                                                                             |
| Peer Reviewer Name                 | Name                  | e-mail                                                                                                                                                                                                                                   | E-mail                                                                             |
| Scientific Committee Approval Date | 15/01/2026            | Version Number                                                                                                                                                                                                                           | 1.0                                                                                |

### Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

|                      |        |          |  |
|----------------------|--------|----------|--|
| Prerequisite module  | CYB303 | Semester |  |
| Co-requisites module | None   | Semester |  |

### Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b><br>أهداف المادة الدراسية | 6. Introduce students to the foundational concepts, principles, and terminology of cOmputer network security. This includes understanding the importance of security for communication, networks, and the role of modern method of sending data saving.<br>7. Familiarize students with various methods for security of networks, standards, and best practices that are relevant to the field of communication security. This includes understanding sending and receiving requirements of security, best protocols, and main gools of security communication protocol. |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | <ol style="list-style-type: none"> <li>8. Explore the principles and techniques of networks and communications security through standard detections.</li> <li>9. Provide students with knowledge of development practices and methodologies of security. This involves offering data transmission techniques safely.</li> <li>10. Introduce students to the fundamentals of computer network security. This includes learning how to addressing, as well as investigations of this addressing methods and preserving varabile them.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Module Learning Outcomes</b><br><br>مخرجات التعلم للمادة الدراسية | <ol style="list-style-type: none"> <li>10. Gain a comprehensive understanding of the fundamental concepts, principles, and terminology related to computer network security, including the importance of security communication systems.</li> <li>11. Demonstrate knowledge and comprehension of various addressing methods, standards, and best practices relevant to data communication, including sending and recieving security requirements.</li> <li>12. Apply the principles and techniques of security types, including understanding security of network architecture and communication protocols.</li> <li>13. Apply software development practices and methodologies, including understanding common software applications of security.</li> <li>14. Understand and apply the fundamentals of communication security, including security of data transmission media.</li> <li>15. Apply the principles and protocols of communication, including understanding attacks methods, management, and the role of producting of the networks.</li> <li>16. Apply skills in managing networks, including understanding communication safely.</li> <li>17. Understand and apply considerations associated with data communication producting.</li> <li>18. Demonstrate awareness and understanding of emerging technologies and trends in data communication producting , including devices, and Internet.</li> </ol> |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية                | <p>Indicative content includes the following.</p> <ul style="list-style-type: none"> <li>• Module 1: Introduction to computer network security. [12 hrs]</li> <li>• Module 2: authentication. [12 hrs]</li> <li>• Module 3: network layer security. [12 hrs]</li> <li>• Module 4:firewalls. [12 hrs]</li> <li>• Module 5: intrusion detection systems. [12 hrs]</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Learning and Teaching Strategies</b>                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

## استراتيجيات التعلم والتعليم

|                   |                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b> | The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students. |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

|                                                                                |            |                                                                           |   |
|--------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------|---|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 47         | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 3 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 103        | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | <b>150</b> |                                                                           |   |

## Module Evaluation

تقييم المادة الدراسية

|                             |                        | Time/Number | Weight (Marks) | Week Due   | Relevant Learning Outcome |
|-----------------------------|------------------------|-------------|----------------|------------|---------------------------|
| <b>Formative assessment</b> | <b>Quizzes</b>         | 2           | 10% (10)       | 5 and 10   | LO #1, #2 and #10, #11    |
|                             | <b>Assignments</b>     | 2           | 10% (10)       | 2 and 12   | LO #3, #4 and #6, #7      |
|                             | <b>Projects / Lab.</b> | 1           | 10% (10)       | Continuous | All                       |
|                             | <b>Report</b>          | 1           | 10% (10)       | 13         | LO #5, #8 and #10         |

|                             |                     |     |                  |    |            |
|-----------------------------|---------------------|-----|------------------|----|------------|
| <b>Summative assessment</b> | <b>Midterm Exam</b> | 2hr | 10% (10)         | 7  | LO #1 - #7 |
|                             | <b>Final Exam</b>   | 3hr | 50% (50)         | 16 | All        |
| <b>Total assessment</b>     |                     |     | 100% (100 Marks) |    |            |

| <b>Delivery Plan (Weekly Syllabus)</b><br>المنهاج الاسبوعي النظري |                                           |
|-------------------------------------------------------------------|-------------------------------------------|
|                                                                   | Material Covered                          |
| <b>Week 1</b>                                                     | Introduction to computer network security |
| <b>Week 2</b>                                                     | End point authentication                  |
| <b>Week 3</b>                                                     | Authentication protocols                  |
| <b>Week 4</b>                                                     | Extended authentication protocols         |
| <b>Week 5</b>                                                     | Network layer security                    |
| <b>Week 6</b>                                                     | Virtual private networks                  |
| <b>Week 7</b>                                                     | AH and ESP protocol                       |
| <b>Week 8</b>                                                     | Security associations                     |
| <b>Week 9</b>                                                     | IP security datagram                      |
| <b>Week 10</b>                                                    | Mid exam                                  |
| <b>Week 11</b>                                                    | Key management of IP security             |
| <b>Week 12</b>                                                    | Operational security                      |
| <b>Week 13</b>                                                    | Firewalls                                 |
| <b>Week 14</b>                                                    | Access control by firewalls               |
| <b>Week 15</b>                                                    | Intrusion detection systems               |

## Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي للمختبر

|         | Material Covered                                                |
|---------|-----------------------------------------------------------------|
| Week 1  | Introduction to use packet tracer simulator of RIP Protocol     |
| Week 2  | Design network with router depending of dynamic routing (RIP)   |
| Week 3  | Design network with 2 router depending of dynamic routing (RIP) |
| Week 4  | Design network with 3 router depending of dynamic routing (RIP) |
| Week 5  | Design network with 4 router depending of dynamic routing (RIP) |
| Week 6  | Simulate security of server by IP address                       |
| Week 7  | Simulate security of server by location address                 |
| Week 8  | Design network with 2 server and realized security              |
| Week 9  | Simulate dynamic allocation of IP addresses                     |
| Week 10 | Exam (1)                                                        |
| Week 11 | Simulate firewall in simple network                             |
| Week 12 | Simulate firewall in extended network                           |
| Week 13 | Simulate firewall in network as gateway                         |
| Week 14 | Simulate intrusion detection systems                            |
| Week 15 | Exam (2)                                                        |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|  | Text | Available in the Library? |
|--|------|---------------------------|
|--|------|---------------------------|

|                          |                                                                                                                                |    |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Required Texts</b>    | Ali Sadiqui, Willy, " Computer Network Security ", series Edition, Jon Wiley & Sons, Inc, 2020.                                | No |
| <b>Recommended Texts</b> | James F. Kurose & Kulth W. Ross . " Computer Networking : A Top-Down Approach ". Seventh Edition ,Person Education, Inc, 2017. | No |
| <b>Websites</b>          |                                                                                                                                |    |

| <b>Grading Scheme</b><br>مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                |                         |                     |          |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade                   | التقدير             | Marks %  | Definition                            |
| <b>Success Group</b><br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                   | <b>A</b> - Excellent    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>B</b> - Very Good    | جيد جدا             | 80 - 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>C</b> – Good         | جيد                 | 70 - 79  | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>D</b> - Satisfactory | متوسط               | 60 - 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>E</b> - Sufficient   | مقبول               | 50 - 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                        | <b>FX</b> – Fail        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>F</b> – Fail         | راسب                | (0-44)   | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                         |                     |          |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                         |                     |          |                                       |

## Module 2

### MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

| Module Information                 |                                  |   |                                                                                                                                                                                                                                                                                      |        |
|------------------------------------|----------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| معلومات المادة الدراسية            |                                  |   |                                                                                                                                                                                                                                                                                      |        |
| Module Title                       | <b>Cloud Computing Principle</b> |   | Module Delivery                                                                                                                                                                                                                                                                      |        |
| Module Type                        | Core                             |   | <input checked="" type="checkbox"/> Theory<br><input checked="" type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input checked="" type="checkbox"/> Tutorial<br><input checked="" type="checkbox"/> Practical<br><input checked="" type="checkbox"/> Seminar |        |
| Module Code                        | CyB309                           |   |                                                                                                                                                                                                                                                                                      |        |
| ECTS Credits                       | 4                                |   |                                                                                                                                                                                                                                                                                      |        |
| SWL (hr/sem)                       | 100                              |   |                                                                                                                                                                                                                                                                                      |        |
| Module Level                       | 1                                | 1 | Semester of Delivery                                                                                                                                                                                                                                                                 | 2      |
| Administering Department           | CyB                              |   | College                                                                                                                                                                                                                                                                              | CSIS   |
| Module Leader                      | Dr. Haider M. Al-Mashhadi        |   | e-mail                                                                                                                                                                                                                                                                               |        |
| Module Leader's Acad. Title        | Prof.                            |   | Module Leader's Qualification                                                                                                                                                                                                                                                        | PHD    |
| Module Tutor                       | Name (if available)              |   | e-mail                                                                                                                                                                                                                                                                               | E-mail |
| Peer Reviewer Name                 | Name                             |   | e-mail                                                                                                                                                                                                                                                                               | E-mail |
| Scientific Committee Approval Date |                                  |   | Version Number                                                                                                                                                                                                                                                                       | 1.0    |

| <b>Relation with other Modules</b><br>العلاقة مع المواد الدراسية الأخرى |                               |                 |           |
|-------------------------------------------------------------------------|-------------------------------|-----------------|-----------|
| <b>Prerequisite module</b>                                              | None                          | <b>Semester</b> |           |
| <b>Co-requisites module</b>                                             | CyB Cloud Computing Principle | <b>Semester</b> | 2/Level 1 |

| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |
|---------------------------------------------------------------------------------------------------------------------------|
|---------------------------------------------------------------------------------------------------------------------------|

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>                | <ol style="list-style-type: none"> <li>1. Gaining knowledge of cloud computing offers valuable insights into various other domains and disciplines.</li> <li>2. Acquiring proficiency in the effective and responsible utilization and administration of cloud computing is crucial for managers and other professionals in today's interconnected global information-driven society.</li> <li>3. Learn that people must understand the components of cloud computing and how all of these components work together to bring value to an organization.</li> <li>4. We need to direct our attention to the role that cloud computing play in today's interconnected global information society.</li> <li>5. The competitiveness of many companies relies significantly on the efficient utilization of information systems. Consequently, we need to consider the potential benefits and drawbacks that integrating information systems can bring to both businesses and society.</li> </ol> <p>what is a cloud computing? According to NIST Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. (Special Publication 800-145).</p> <ol style="list-style-type: none"> <li>1. why learning cloud computing?</li> <li>2. why learning types of cloud computing?</li> </ol> |
|                                                                             | <ol style="list-style-type: none"> <li>3. Why learn about virtualization?</li> <li>4. Why learn about architecture of CC?</li> <li>5. Why Learn about CC services?</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <ol style="list-style-type: none"> <li>1- Provide the student with the essential skills required to excel in the cloud computing.</li> <li>2- Acquire crucial skills for working with virtualization.</li> <li>3- Gain essential skills for handling cc services</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Indicative Contents</b><br>المحتويات الإرشادية                                 | <p><b>Indicative content includes the following.</b></p> <ul style="list-style-type: none"> <li>- Principles of cloud computing</li> </ul> <p>How can use cloud computing, services, types.</p>                                                                                                                                                                                                                          |
| <p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p> |                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Strategies</b>                                                                 | <p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes and the activities, interactive tutorials, and by considering types of simple experiments involving some sampling activities that are interesting to the students.</p> |

| <p><b>Student Workload (SWL)</b></p> <p>الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا</p> |     |                                                                           |     |
|-------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل            | 79  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 5   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل      | 96  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6.4 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل                   | 175 |                                                                           |     |

|                                                              |
|--------------------------------------------------------------|
| <p><b>Module Evaluation</b></p> <p>تقييم المادة الدراسية</p> |
|--------------------------------------------------------------|

|                      |                 | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
|----------------------|-----------------|-------------|------------------|------------|---------------------------|
| Formative assessment | Quizzes         | 2           | 10% (10)         | 5 and 10   | LO #1, #2 and #10, #11    |
|                      | Assignments     | 2           | 10% (10)         | 2 and 12   | LO #3, #4 and #6, #7      |
|                      | Projects / Lab. | 1           | 10% (10)         | Continuous | All                       |
|                      | Report          | 1           | 10% (10)         | 13         | LO #5, #8 and #10         |
| Summative assessment | Midterm Exam    | 2hr         | 10% (10)         | 7          | LO #1 - #7                |
|                      | Final Exam      | 3hr         | 50% (50)         | 16         | All                       |
| Total assessment     |                 |             | 100% (100 Marks) |            |                           |

| Delivery Plan (Weekly Syllabus) |                                                  |
|---------------------------------|--------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                  |
|                                 | Material Covered                                 |
| Week 1                          | Introduction to Cloud computing                  |
| Week 2                          | Building cloud computing environments            |
| Week 3                          | Principles of Parallel and Distributed Computing |
| Week 4                          | Virtualization                                   |
| Week 5                          | Taxonomy of virtualization techniques            |

|                |                                    |
|----------------|------------------------------------|
| <b>Week 6</b>  | Cloud Computing Architecture       |
| <b>Week 7</b>  | Types of clouds                    |
| <b>Week 8</b>  | Open challenges                    |
| <b>Week 9</b>  | CLOUD APPLICATION PROGRAMMING      |
| <b>Week 10</b> | Cloud Platforms in Industry        |
| <b>Week 11</b> | Cloud Applications                 |
| <b>Week 12</b> | Business and consumer applications |
| <b>Week 13</b> | Advanced Topics in Cloud Computing |
| <b>Week 14</b> | Market-based management of clouds  |
| <b>Week 15</b> | Third-party cloud services         |
| <b>Week 16</b> | Exam                               |

| <b>Delivery Plan (Weekly Lab. Syllabus)</b><br>المنهاج الاسبوعي للمختبر |                         |
|-------------------------------------------------------------------------|-------------------------|
|                                                                         | <b>Material Covered</b> |
| <b>Week 1</b>                                                           |                         |
| <b>Week 2</b>                                                           |                         |
| <b>Week 3</b>                                                           |                         |
| <b>Week 4</b>                                                           |                         |
| <b>Week 5</b>                                                           |                         |

|         |  |
|---------|--|
| Week 6  |  |
| Week 7  |  |
| Week 8  |  |
| Week 9  |  |
| Week 10 |  |
| Week 11 |  |
| Week 12 |  |
| Week 13 |  |
| Week 14 |  |
| Week 15 |  |

| <b>Learning and Teaching Resources</b><br><b>مصادر التعلم والتدريس</b> |                                                                                                                                           |                           |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                                                        | Text                                                                                                                                      | Available in the Library? |
| Required Texts                                                         | <b>Mastering Cloud Computing Foundations and Applications Programming by</b> Rajkumar Buyya. Christian Vecchiola, S. Thamarai Selvi, 2013 | No                        |
| Recommended Texts                                                      | Handbook of Cloud Computing: 2010                                                                                                         | No                        |
| Websites                                                               |                                                                                                                                           |                           |

| Grading Scheme                                                                                                                                                                                                                                                                                                                                                                              |                         |                     |          |                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                                                |                         |                     |          |                                       |
| Group                                                                                                                                                                                                                                                                                                                                                                                       | Grade                   | التقدير             | Marks %  | Definition                            |
| <b>Success Group</b><br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                          | <b>A – Excellent</b>    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>B - Very Good</b>    | جيد جدا             | 80 – 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>C – Good</b>         | جيد                 | 70 – 79  | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>D - Satisfactory</b> | متوسط               | 60 – 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>E – Sufficient</b>   | مقبول               | 50 – 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                               | <b>FX – Fail</b>        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>F – Fail</b>         | راسب                | (0-44)   | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                         |                     |          |                                       |
| <p><b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.</p> |                         |                     |          |                                       |

## Module 3

### MODULE DESCRIPTION FORM

#### نموذج وصف المادة الدراسية

|                                                                 |
|-----------------------------------------------------------------|
| <p><b>Module Information</b></p> <p>معلومات المادة الدراسية</p> |
|-----------------------------------------------------------------|

|                                    |                                       |                               |                                                                                                                                                                                                                                                                                                                          |  |
|------------------------------------|---------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Module Title                       | <b>Secure Communication Protocols</b> |                               | Module Delivery                                                                                                                                                                                                                                                                                                          |  |
| Module Type                        | Core                                  |                               | <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Theory</li> <li><input checked="" type="checkbox"/> Lecture</li> <li><input type="checkbox"/> Lab</li> <li><input type="checkbox"/> Tutorial</li> <li><input type="checkbox"/> Practical</li> <li><input type="checkbox"/> Seminar</li> </ul> |  |
| Module Code                        | CyB 311                               |                               |                                                                                                                                                                                                                                                                                                                          |  |
| ECTS Credits                       | 4                                     |                               |                                                                                                                                                                                                                                                                                                                          |  |
| SWL (hr/sem)                       | 125                                   |                               |                                                                                                                                                                                                                                                                                                                          |  |
| Module Level                       | 3                                     | Semester of Delivery          | 2                                                                                                                                                                                                                                                                                                                        |  |
| Administering Department           | CyB                                   | College                       | CSIS                                                                                                                                                                                                                                                                                                                     |  |
| Module Leader                      |                                       | e-mail                        |                                                                                                                                                                                                                                                                                                                          |  |
| Module Leader's Acad. Title        | Assist Prof                           | Module Leader's Qualification | PHD                                                                                                                                                                                                                                                                                                                      |  |
| Module Tutor                       | Name (if available)                   | e-mail                        | E-mail                                                                                                                                                                                                                                                                                                                   |  |
| Peer Reviewer Name                 | Name                                  | e-mail                        | E-mail                                                                                                                                                                                                                                                                                                                   |  |
| Scientific Committee Approval Date |                                       | Version Number                | 1.0                                                                                                                                                                                                                                                                                                                      |  |

|                                                                         |      |          |  |
|-------------------------------------------------------------------------|------|----------|--|
| <b>Relation with other Modules</b><br>العلاقة مع المواد الدراسية الأخرى |      |          |  |
| Prerequisite module                                                     | None | Semester |  |
| Co-requisites module                                                    |      | Semester |  |

|                                                                                                                           |                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Module Aims, Learning Outcomes and Indicative Contents</b><br>أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية |                                                                                       |
| <b>Module Objectives</b><br>أهداف المادة الدراسية                                                                         | 44. Understand Internet.<br>45. Understand the communication process through Internet |

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                             | <p>46. The ability to understand the problems and find if they can be solved using Internet protocols.</p> <p>47. Understand the main types of data communication.</p> <p>48. Learn the basic security principals for data communication.</p> <p>49. Understanding the different layers of data communication.</p> <p>50. Explore the main Internet protocols.</p>                                                                                                                                                                                                                                                                                                                 |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <p>26. Explain the basic concepts in of data communication through a set of tools.</p> <p>27. Acquiring skills in addressing the mathematical problems and proof the solution.</p> <p>28. Acquiring basic skills as an introduction to language construction.</p> <p>29. Acquiring theoretical concepts to deal with (connection-oriented and connection-less communication</p> <p>30. The ability to design Open system Interconnection networking Model.</p> <p>31. The ability to design TCP/IP networking model.</p> <p>32. Ability to distinguish between different types of data communication.</p> <p>33. The logical thinking to formulate the problems and solutions.</p> |
| <p><b>Indicative Contents</b></p> <p>المحتويات الإرشادية</p>                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| <p><b>Learning and Teaching Strategies</b></p> <p>استراتيجيات التعلم والتعليم</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Strategies</b></p>                                                          | <p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through:</p> <ul style="list-style-type: none"> <li>- Readings, self-learning, discussion panels.</li> <li>- Exercises and activities in the classroom.</li> <li>- Directing students to some websites to benefit from them to develop their capabilities.</li> </ul> |

|  |                                                                                                                                     |
|--|-------------------------------------------------------------------------------------------------------------------------------------|
|  | - Holding research seminars through which some problems are explained and analyzed and the mechanism for finding solutions to them. |
|--|-------------------------------------------------------------------------------------------------------------------------------------|

| Student Workload (SWL)                                                         |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا                                        |     |                                                                           |     |
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطلاب خلال الفصل       | 62  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطلاب أسبوعيا       | 4.1 |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطلاب خلال الفصل | 63  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطلاب أسبوعيا | 4.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطلاب خلال الفصل              | 125 |                                                                           |     |

| Module Evaluation     |                 |             |                  |          |                           |
|-----------------------|-----------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |          |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 10% (10)         | 5 and 10 | All                       |
|                       | Assignments     | 2           | 20% (20)         | 2 and 12 | LO #2, #4 and #5, #8      |
|                       | Projects / Lab. | -           | -                | -        | -                         |
|                       | Report          | 1           | 10% (10)         | 13       | LO #1, #3, #6 and #7      |
| Summative assessment  | Midterm Exam    | 2hr         | 10% (10)         | 7        | All                       |
|                       | Final Exam      | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |          |                           |

### Delivery Plan (Weekly Syllabus)

#### المنهاج الاسبوعي النظري

|                | Material Covered                                                     |
|----------------|----------------------------------------------------------------------|
| <b>Week 1</b>  | Introduction to Internet                                             |
| <b>Week 2</b>  | Introduction to data communication                                   |
| <b>Week 3</b>  | The basic structure of Internet                                      |
| <b>Week 4</b>  | Connection-oriented versus Connection-less communication             |
| <b>Week 5</b>  | OSI networking model                                                 |
| <b>Week 6</b>  | TCP/IP networking model                                              |
| <b>Week 7</b>  | Mid-Term Exam                                                        |
| <b>Week 8</b>  | Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) |
| <b>Week 9</b>  | Internet Protocol and its Header                                     |
| <b>Week 10</b> | Domain Name System (DNS)                                             |
| <b>Week 11</b> | Email and Simple Mail Transfer Protocol                              |
| <b>Week 12</b> | Wireless-Fidelity (Wi-Fi)                                            |
| <b>Week 13</b> | Hyper Text Transfer Protocol (HTTP)                                  |
| <b>Week 14</b> | File Transfer Protocol (FTP)                                         |
| <b>Week 15</b> | Internet Secure Access                                               |
| <b>Week 16</b> | Final Exam                                                           |

### Learning and Teaching Resources

#### مصادر التعلم والتدريس

|                   | Text                                                                 | Available in the Library? |
|-------------------|----------------------------------------------------------------------|---------------------------|
| Required Texts    | <b>Computer Networking and the Internet", Fifth Edition, 2005.</b>   |                           |
| Recommended Texts | <b>Computer Networking: A Top-Down Approach", 7th Edition, 2016.</b> |                           |
| Websites          |                                                                      |                           |

| Grading Scheme                                                                                                                                                                                                                                                                                                                                                                       |                         |                     |          |                                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                                         |                         |                     |          |                                       |
| Group                                                                                                                                                                                                                                                                                                                                                                                | Grade                   | التقدير             | Marks %  | Definition                            |
| <b>Success Group</b><br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                   | <b>A – Excellent</b>    | امتياز              | 90 – 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>B - Very Good</b>    | جيد جدا             | 80 – 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>C – Good</b>         | جيد                 | 70 – 79  | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>D - Satisfactory</b> | متوسط               | 60 – 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>E – Sufficient</b>   | مقبول               | 50 – 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                        | <b>FX – Fail</b>        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                      | <b>F – Fail</b>         | راسب                | (0-44)   | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                      |                         |                     |          |                                       |
| <b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above. |                         |                     |          |                                       |

## Module 4

### MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

| Module Information                 |                                    |                               |                                                                                                                                                                                                                                                                                                                          |
|------------------------------------|------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| معلومات المادة الدراسية            |                                    |                               |                                                                                                                                                                                                                                                                                                                          |
| Module Title                       | <b>Information Risk Management</b> |                               | Module Delivery                                                                                                                                                                                                                                                                                                          |
| Module Type                        | Core                               |                               | <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Theory</li> <li><input checked="" type="checkbox"/> Lecture</li> <li><input type="checkbox"/> Lab</li> <li><input type="checkbox"/> Tutorial</li> <li><input type="checkbox"/> Practical</li> <li><input type="checkbox"/> Seminar</li> </ul> |
| Module Code                        | CyB 310                            |                               |                                                                                                                                                                                                                                                                                                                          |
| ECTS Credits                       | 4                                  |                               |                                                                                                                                                                                                                                                                                                                          |
| SWL (hr/sem)                       | 125                                |                               |                                                                                                                                                                                                                                                                                                                          |
| Module Level                       | 2                                  | Semester of Delivery          | 1                                                                                                                                                                                                                                                                                                                        |
| Administering Department           | CyB                                | College                       | CSIS                                                                                                                                                                                                                                                                                                                     |
| Module Leader                      |                                    | e-mail                        |                                                                                                                                                                                                                                                                                                                          |
| Module Leader's Acad. Title        | Assist lect                        | Module Leader's Qualification | PHD                                                                                                                                                                                                                                                                                                                      |
| Module Tutor                       | Name (if available)                | e-mail                        | E-mail                                                                                                                                                                                                                                                                                                                   |
| Peer Reviewer Name                 | Name                               | e-mail                        | E-mail                                                                                                                                                                                                                                                                                                                   |
| Scientific Committee Approval Date |                                    | Version Number                | 1.0                                                                                                                                                                                                                                                                                                                      |

### Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

|                      |      |          |  |
|----------------------|------|----------|--|
| Prerequisite module  | None | Semester |  |
| Co-requisites module |      | Semester |  |

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Module Objectives</b></p> <p>أهداف المادة الدراسية</p>                | <p>51. Understand the concept of information risk management and its role in protecting organizational information assets.</p> <p>52. Identify different types of information security risks, including technical, operational, and human-related risks.</p> <p>53. Analyze threats and vulnerabilities that may impact confidentiality, integrity, and availability (CIA triad).</p> <p>54. Assess risk likelihood and impact using qualitative and quantitative risk assessment methods.</p> <p>55. Apply risk management frameworks and standards such as ISO/IEC 27005 and NIST Risk Management Framework.</p> <p>56. Evaluate and prioritize risks based on organizational risk appetite and tolerance.</p> <p>57. Select appropriate risk treatment options, including risk acceptance, mitigation, transfer, and avoidance.</p> <p>58. Design and recommend security controls to reduce identified risks effectively.</p> <p>59. Monitor and review risks continuously to ensure controls remain effective over time.</p> |
| <p><b>Module Learning Outcomes</b></p> <p>مخرجات التعلم للمادة الدراسية</p> | <p>34. Define information risk management and explain its importance in protecting organizational information assets.</p> <p>35.</p> <p>36. Identify information security threats, vulnerabilities, and risks affecting information systems.</p> <p>37. Explain the impact of risks on confidentiality, integrity, and availability (CIA triad).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

|                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                       | <p>38. Analyze risk scenarios by evaluating likelihood and potential impact.</p> <p>39. Apply information risk management frameworks and standards such as NIST RMF and ISO/IEC 27005.</p> <p>40. Assess and prioritize risks based on organizational risk appetite and tolerance levels.</p> <p>41. Select and justify appropriate risk treatment strategies (accept, mitigate, transfer, avoid).</p> <p>42. Design suitable security controls to reduce or manage identified information risks.</p> <p>43. Monitor and review risks and controls to ensure ongoing effectiveness.</p> |
| <b>Indicative Contents</b><br><br>المحتويات الإرشادية |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Strategies</b>                                                      | <p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through:</p> <ul style="list-style-type: none"> <li>- Readings, self-learning, discussion panels.</li> <li>- Exercises and activities in the classroom.</li> <li>- Directing students to some websites to benefit from them to develop their capabilities.</li> <li>- Holding research seminars through which some problems are explained and analyzed and the mechanism for finding solutions to them.</li> </ul> |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا |    |                             |     |
|--------------------------------------------------------------------------|----|-----------------------------|-----|
| <b>Structured SWL (h/sem)</b>                                            | 62 | <b>Structured SWL (h/w)</b> | 4.1 |

|                                                                                |            |                                                                           |     |
|--------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------|-----|
| الحمل الدراسي المنتظم للطالب خلال الفصل                                        |            | الحمل الدراسي المنتظم للطالب أسبوعيا                                      |     |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 63         | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 4.2 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | <b>125</b> |                                                                           |     |

| Module Evaluation     |                 |             |                  |          |                           |
|-----------------------|-----------------|-------------|------------------|----------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |          |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 10% (10)         | 5 and 10 | All                       |
|                       | Assignments     | 2           | 20% (20)         | 2 and 12 | LO #2, #4 and #5, #8      |
|                       | Projects / Lab. | -           | -                | -        | -                         |
|                       | Report          | 1           | 10% (10)         | 13       | LO #1, #3, #6 and #7      |
| Summative assessment  | Midterm Exam    | 2hr         | 10% (10)         | 7        | All                       |
|                       | Final Exam      | 3hr         | 50% (50)         | 16       | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |          |                           |

| Delivery Plan (Weekly Syllabus) |                                               |
|---------------------------------|-----------------------------------------------|
| المنهاج الاسبوعي النظري         |                                               |
|                                 | Material Covered                              |
| Week 1                          | Introduction to Cybersecurity Risk Management |

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | <ul style="list-style-type: none"> <li>• Learning objectives: Define risk, threat, vulnerability, impact; explain risk management lifecycle; outline course expectations and assessment.</li> <li>• Topics: <ul style="list-style-type: none"> <li>o Key concepts: CIA triad, risk, threat, vulnerability, impact, likelihood</li> <li>o Risk management lifecycle: identify, assess, treat, monitor, communicate</li> <li>o Overview of frameworks: NIST RMF/CSF, ISO 27001/27005, FAIR (overview)</li> </ul> </li> <li>• Activities: Icebreaker case: identify risks in a campus IT service; quick risk vocabulary quiz</li> <li>• Readings: ISO/IEC 27001, 27005 (intro sections); NIST CSF introductory material</li> <li>• Assessment: Short quiz; 1-page reflection on governance vs. policy</li> </ul> |
| <b>Week 2</b> | <p>: Governance, Stakeholders, and Risk Appetite</p> <ul style="list-style-type: none"> <li>• Learning objectives: Identify stakeholders; discuss governance, policy vs. procedure; define risk appetite and culture.</li> <li>• Topics: <ul style="list-style-type: none"> <li>o Stakeholder mapping; governance structures; roles (board, exec, IT, security, compliance, legal, HR)</li> <li>o Risk appetite, tolerance, culture</li> <li>o Policy framework alignment</li> </ul> </li> <li>• Activities: Stakeholder role-play exercise; map a simple risk governance structure</li> <li>• Readings: NIST SP 800-39 (Organization-wide risk management) overview; selected ISO 27001 sections</li> </ul>                                                                                                  |
| <b>Week 3</b> | <ul style="list-style-type: none"> <li>• Learning objectives: Identify assets; differentiate asset types; begin asset inventories.</li> <li>• Topics: <ul style="list-style-type: none"> <li>o Asset types: information, systems, people, processes, third parties</li> <li>o Asset inventory techniques; critical asset identification</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                |

|                |                                                                                                                                                                                                                                                                                               |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | <ul style="list-style-type: none"> <li>Activities: Build a sample asset inventory for a department; catalog critical assets</li> <li>Readings: ISO 27001 control A.8 (Asset management) overview</li> <li>Assessment: Asset inventory submission with justification of criticality</li> </ul> |
| <b>Week 4</b>  | Threat Modeling Basics.                                                                                                                                                                                                                                                                       |
| <b>Week 5</b>  | Vulnerabilities and Mapping Threats to Assets                                                                                                                                                                                                                                                 |
| <b>Week 6</b>  | Business Impact Analysis (BIA) and RTO/RPO                                                                                                                                                                                                                                                    |
| <b>Week 7</b>  | Qualitative Risk Assessment Methods                                                                                                                                                                                                                                                           |
| <b>Week 8</b>  | Quantitative Risk Assessment and Data                                                                                                                                                                                                                                                         |
| <b>Week 9</b>  | Control Taxonomy and Defense in Depth                                                                                                                                                                                                                                                         |
| <b>Week 10</b> | Privacy, Legal, and Ethical Considerations                                                                                                                                                                                                                                                    |
| <b>Week 11</b> | Selecting and Evaluating Controls                                                                                                                                                                                                                                                             |
| <b>Week 12</b> | Risk Communication and Reporting                                                                                                                                                                                                                                                              |
| <b>Week 13</b> | Incident Response and Recovery Risk                                                                                                                                                                                                                                                           |
| <b>Week 14</b> | Security Operations, Monitoring, and Continuous Improvement                                                                                                                                                                                                                                   |
| <b>Week 15</b> | Capstone Design and Program Design                                                                                                                                                                                                                                                            |
| <b>Week 16</b> | <b>Exam</b>                                                                                                                                                                                                                                                                                   |

| <b>Learning and Teaching Resources</b><br><b>مصادر التعلم والتدريس</b> |                                               |                                  |
|------------------------------------------------------------------------|-----------------------------------------------|----------------------------------|
|                                                                        | <b>Text</b>                                   | <b>Available in the Library?</b> |
| <b>Required Texts</b>                                                  | <b>Cyber Risk Resources for Practitioners</b> |                                  |
| <b>Recommended Texts</b>                                               |                                               |                                  |

|          |  |
|----------|--|
| Websites |  |
|----------|--|

| Grading Scheme                                                                                                                                                                                                                                                                                                                                                                              |                  |                     |          |                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------|----------|---------------------------------------|
| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                                                |                  |                     |          |                                       |
| Group                                                                                                                                                                                                                                                                                                                                                                                       | Grade            | التقدير             | Marks %  | Definition                            |
| Success Group<br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                                 | A – Excellent    | امتياز              | 90 – 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                             | B - Very Good    | جيد جدا             | 80 – 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | C – Good         | جيد                 | 70 – 79  | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | D - Satisfactory | متوسط               | 60 – 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                             | E – Sufficient   | مقبول               | 50 – 59  | Work meets minimum criteria           |
| Fail Group<br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                                      | FX – Fail        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                             | F – Fail         | راسب                | (0-44)   | Considerable amount of work required  |
|                                                                                                                                                                                                                                                                                                                                                                                             |                  |                     |          |                                       |
| <p><b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.</p> |                  |                     |          |                                       |

## Module 5

### MODULE DESCRIPTION FORM

#### نموذج وصف المادة الدراسية

| Module Information      |                       |                 |
|-------------------------|-----------------------|-----------------|
| معلومات المادة الدراسية |                       |                 |
| Module Title            | <b>MALICIOUS CODE</b> | Module Delivery |

|                                    |                     |                      |                                                                                                                                                                                                                                                     |                          |
|------------------------------------|---------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Module Type                        | Core                |                      | <input checked="" type="checkbox"/> Theory<br><input type="checkbox"/> Lecture<br><input checked="" type="checkbox"/> Lab<br><input checked="" type="checkbox"/> Tutorial<br><input type="checkbox"/> Practical<br><input type="checkbox"/> Seminar |                          |
| Module Code                        | CyB312              |                      |                                                                                                                                                                                                                                                     |                          |
| ECTS Credits                       | 6                   |                      |                                                                                                                                                                                                                                                     |                          |
| SWL (hr/sem)                       | 150                 |                      |                                                                                                                                                                                                                                                     |                          |
| Module Level                       | 1                   | Semester of Delivery | 1                                                                                                                                                                                                                                                   |                          |
| Administering Department           | CyB                 | College              | CSIS                                                                                                                                                                                                                                                |                          |
| Module Leader                      | Dr. Sari Ali Sari   |                      | e-mail                                                                                                                                                                                                                                              | sari.ali@uobasrah.edu.iq |
| Module Leader's Acad. Title        | Assist Proff        |                      | Module Leader's Qualification                                                                                                                                                                                                                       | PHD                      |
| Module Tutor                       | Name (if available) |                      | e-mail                                                                                                                                                                                                                                              | E-mail                   |
| Peer Reviewer Name                 | Name                |                      | e-mail                                                                                                                                                                                                                                              | E-mail                   |
| Scientific Committee Approval Date |                     | Version Number       | 1.0                                                                                                                                                                                                                                                 |                          |

### Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

|                      |                                |          |           |
|----------------------|--------------------------------|----------|-----------|
| Prerequisite module  | None                           | Semester |           |
| Co-requisites module | CyB107 Computer Programming II | Semester | 2/Level 3 |

### Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

|                                                                        |                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Objectives</b><br>أهداف المادة الدراسية                      | 1. Gain knowledge about the functioning of malware which includes computer viruses, worms, Trojan horses and spyware.<br>2. Know the functions of each malicious program, including stealing, encrypting or deleting sensitive data, changing or stealing basic computer functions, and monitoring users' computer activity without their permission. |
| <b>Module Learning Outcomes</b><br>مخرجات التعلم للمادة الدراسية       | 1. Recognize Malicious software.<br>2. List the various terms associated with Malicious Code.<br>3. Summarize the different types of malicious software.                                                                                                                                                                                              |
| <b>Indicative Contents</b><br>المحتويات الإرشادية                      | 1. Study all generations of Antiviruses.<br>2. Learning virus kits and virus tools.                                                                                                                                                                                                                                                                   |
| <b>Learning and Teaching Strategies</b><br>استراتيجيات التعلم والتعليم |                                                                                                                                                                                                                                                                                                                                                       |
| <b>Strategies</b>                                                      | Methodological books, resources (internet and library), dialogues reinforced with illustrative examples, Theoretical lectures, laboratories, practical tasks, using modern devices to present practical ideas to students ( data show, electronic board ).                                                                                            |

| <b>Student Workload (SWL)</b><br>الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا       |     |                                                                           |     |
|--------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------|-----|
| <b>Structured SWL (h/sem)</b><br>الحمل الدراسي المنتظم للطالب خلال الفصل       | 79  | <b>Structured SWL (h/w)</b><br>الحمل الدراسي المنتظم للطالب أسبوعيا       | 5   |
| <b>Unstructured SWL (h/sem)</b><br>الحمل الدراسي غير المنتظم للطالب خلال الفصل | 96  | <b>Unstructured SWL (h/w)</b><br>الحمل الدراسي غير المنتظم للطالب أسبوعيا | 6.4 |
| <b>Total SWL (h/sem)</b><br>الحمل الدراسي الكلي للطالب خلال الفصل              | 175 |                                                                           |     |

| Module Evaluation     |                 |             |                  |            |                           |
|-----------------------|-----------------|-------------|------------------|------------|---------------------------|
| تقييم المادة الدراسية |                 |             |                  |            |                           |
|                       |                 | Time/Number | Weight (Marks)   | Week Due   | Relevant Learning Outcome |
| Formative assessment  | Quizzes         | 2           | 10% (10)         | 5 and 10   | LO #1, #2 and #10, #11    |
|                       | Assignments     | 2           | 10% (10)         | 2 and 12   | LO #3, #4 and #6, #7      |
|                       | Projects / Lab. | 1           | 10% (10)         | Continuous | All                       |
|                       | Report          | 1           | 10% (10)         | 13         | LO #5, #8 and #10         |
| Summative assessment  | Midterm Exam    | 2hr         | 10% (10)         | 7          | LO #1 - #7                |
|                       | Final Exam      | 3hr         | 50% (50)         | 16         | All                       |
| Total assessment      |                 |             | 100% (100 Marks) |            |                           |

| Delivery Plan (Weekly Syllabus) |                                                                                                                                                   |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| المنهاج الاسبوعي النظري         |                                                                                                                                                   |
|                                 | Material Covered                                                                                                                                  |
| Week 1                          | Malicious Software definition <ul style="list-style-type: none"> <li>Types Of Malicious Software</li> <li>Backdoor</li> <li>Logic Bomb</li> </ul> |
| Week 2                          | <ul style="list-style-type: none"> <li>Trojan</li> <li>Horses</li> <li>Mobile Code</li> <li>Multiple-Threat Malware</li> </ul>                    |
| Week 3                          | Viruses <ul style="list-style-type: none"> <li>understanding Viruses</li> </ul>                                                                   |

|                |                                                                                                                                         |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 4</b>  | The Nature of viruses                                                                                                                   |
| <b>Week 5</b>  | Viruses Classification <ul style="list-style-type: none"> <li>• Viruses Kits</li> <li>• Marco Viruses</li> </ul>                        |
| <b>Week 6</b>  | quiz                                                                                                                                    |
| <b>Week 7</b>  | E-Mail Viruses <ul style="list-style-type: none"> <li>• Boot Sector Viruses</li> <li>• Executable Viruses</li> </ul>                    |
| <b>Week 8</b>  | Virus Countermeasures <ul style="list-style-type: none"> <li>• Antivirus Approaches</li> <li>• Advanced Antivirus Techniques</li> </ul> |
| <b>Week 9</b>  | Worms <ul style="list-style-type: none"> <li>• Introduction of worms</li> <li>• Understanding Viruses Propagation</li> </ul>            |
| <b>Week 10</b> | The Morris Worm <ul style="list-style-type: none"> <li>• Worm Propagation Model</li> <li>• Recent Worm Attacks</li> </ul>               |
| <b>Week 11</b> | quiz                                                                                                                                    |
| <b>Week 12</b> | State of Worm Technology <ul style="list-style-type: none"> <li>• Mobile Phone Worms</li> <li>• Worm Countermeasures</li> </ul>         |
| <b>Week 13</b> | Middle Exam                                                                                                                             |
| <b>Week 14</b> | Distributed Denial of Service Attacks<br>Constructing the Attack Network                                                                |
| <b>Week 15</b> | DDoS Countermeasures                                                                                                                    |
| <b>Week 16</b> | Exam                                                                                                                                    |

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

|        | Material Covered                                                                                                                                                                                                                                                                                        |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Week 1 | <p>Malware analysis</p> <ul style="list-style-type: none"> <li>• Malware analysis purposes</li> <li>• Step-by-step analysis</li> <li>• Malware analysis stages/flow</li> <li>• Malware analysis laboratory</li> <li>• Virtual machine</li> <li>• Virtual network</li> </ul>                             |
| Week 2 | <p>Basic Static Analysis</p> <ul style="list-style-type: none"> <li>• Antivirus scanning</li> <li>• Malware hashing</li> <li>• Malware string</li> <li>• Detect malware packer/obfuscated</li> <li>• Inspect Portable Executable (PE) Header</li> <li>• Exploring Dynamic Link Library (DLL)</li> </ul> |
| Week 3 | <p>Basic Dynamic Analysis</p> <ul style="list-style-type: none"> <li>• Dynamic analysis</li> <li>• Sandboxing</li> <li>• Dynamic analysis tools</li> <li>• Running malware</li> </ul>                                                                                                                   |
| Week 4 | <p>Malware runtime analysis</p> <ul style="list-style-type: none"> <li>• Malware Runtime Analysis</li> <li>• Process monitor</li> <li>• Process explorer</li> <li>• Snapshot</li> </ul>                                                                                                                 |
| Week 5 | <p>Network monitoring</p> <ul style="list-style-type: none"> <li>• Network packet sniffing</li> <li>• Fake services</li> </ul>                                                                                                                                                                          |

|                |                                                                                                                                                                                                                                                                                                              |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 6</b>  | <p>Advance Static Analysis</p> <ul style="list-style-type: none"> <li>• Core X86 assembly concept</li> <li>• X86 architecture</li> <li>• Main memory</li> <li>• Register</li> <li>• Stack</li> <li>• Assembly instruction</li> </ul>                                                                         |
| <b>Week 7</b>  | <p>Analyzing malicious code</p> <ul style="list-style-type: none"> <li>• Windows API</li> <li>• File system functions</li> <li>• Windows registry</li> <li>• DLL</li> <li>• Exception</li> </ul>                                                                                                             |
| <b>Week 8</b>  | quizz                                                                                                                                                                                                                                                                                                        |
| <b>Week 9</b>  | <p>Malware Behavior</p> <ul style="list-style-type: none"> <li>• Malware Functionalities</li> <li>• HTTP Command and Control</li> <li>• Custom Command and Control</li> <li>• Custom C2 Sample</li> <li>• PowerShell Command</li> <li>• How Attackers Use PowerShell</li> <li>• PowerSHell Attack</li> </ul> |
| <b>Week 10</b> | <p>Code debugging</p> <ul style="list-style-type: none"> <li>• Breakpoints</li> <li>• Exception</li> <li>• Modify program execution</li> <li>• User/kernel mode</li> </ul>                                                                                                                                   |

|                |                                                                                                                                                                                                                                                                  |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Week 11</b> | <p>Malware debugging with OllyDbg</p> <ul style="list-style-type: none"> <li>• OllyDbg</li> <li>• Code execution</li> <li>• Run/step Into/step over</li> <li>• Breakpoints</li> </ul>                                                                            |
| <b>Week 12</b> | <p>Loading DLLKernel debugging with WinDbg Setup kernel debugging</p> <ul style="list-style-type: none"> <li>• VM setup</li> <li>• Using WinDbg</li> <li>• Reading from memory</li> <li>• Kernel Debugging in Practice</li> </ul>                                |
| <b>Week 13</b> | <p>Self Defending Malware</p> <ul style="list-style-type: none"> <li>• Packer and unpacking</li> <li>• Packer identification methods</li> <li>• Unpacking complexities</li> <li>• Structured exception handlers</li> <li>• Original Entry Point (OEP)</li> </ul> |
| <b>Week 14</b> | quiz                                                                                                                                                                                                                                                             |
| <b>Week 15</b> | <p>Bypassing analysis defences</p> <ul style="list-style-type: none"> <li>• Multiple malware defensive techniques</li> <li>• Anti-disassembly</li> <li>• Anti-debugging</li> <li>• Anti-virtual machine</li> </ul>                                               |

## Learning and Teaching Resources

مصادر التعلم والتدريس

|                          | Text                                                                                                                                                                                                                                  | Available in the Library? |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <b>Required Texts</b>    | <ul style="list-style-type: none"> <li>• Cryptography And Network Security- Principles And Practice- Fifth Edition William Stallings.</li> <li>• Cyber security Essentials, James Graham, Richard Howard, Ryan Olson,2011.</li> </ul> | No                        |
| <b>Recommended Texts</b> | <ul style="list-style-type: none"> <li>• Computer viruses and malware by john AY cock University of calgary canada 2006 springer</li> </ul>                                                                                           | No                        |
| <b>Websites</b>          | <a href="https://www.guru99.com/python-tutorials.html">https://www.guru99.com/python-tutorials.html</a>                                                                                                                               |                           |

| Grading Scheme                                                                                                                                                                                                                                                                                                                                                                              |                         |                     |          |                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------|----------|---------------------------------------|
| مخطط الدرجات                                                                                                                                                                                                                                                                                                                                                                                |                         |                     |          |                                       |
| Group                                                                                                                                                                                                                                                                                                                                                                                       | Grade                   | التقدير             | Marks %  | Definition                            |
| <b>Success Group</b><br>(50 - 100)                                                                                                                                                                                                                                                                                                                                                          | <b>A – Excellent</b>    | امتياز              | 90 - 100 | Outstanding Performance               |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>B - Very Good</b>    | جيد جدا             | 80 – 89  | Above average with some errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>C – Good</b>         | جيد                 | 70 – 79  | Sound work with notable errors        |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>D - Satisfactory</b> | متوسط               | 60 – 69  | Fair but with major shortcomings      |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>E – Sufficient</b>   | مقبول               | 50 – 59  | Work meets minimum criteria           |
| <b>Fail Group</b><br>(0 – 49)                                                                                                                                                                                                                                                                                                                                                               | <b>FX – Fail</b>        | راسب (قيد المعالجة) | (45-49)  | More work required but credit awarded |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>F – Fail</b>         | راسب                | (0-44)   | Considerable amount of work required  |
| <p><b>Note:</b> Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.</p> |                         |                     |          |                                       |