MODULE DESCRIPTION FORM

Module Information					
Module Title	**Applied Mathematics for Health Informatics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** **Practical** ☐ **Seminar**	
Module Code	**IMS102**				
ECTS Credits	**4**				
SWL (hr/sem)	**200**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	IMS		**College**	Type College Code	
Module Leader	Hadell ismail mustafa		**e-mail**	hadeel.mustafa@uobasrah.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	1.0	

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Objectives	1. Introducing the student to the concept of biological statistics and its importance 2. Introducing the student to the methodology of determining the appropriate sample size for the study and its properties, to ensure the accuracy of his statistical analysis. 3. Introducing the student to all descriptive statistics measurements and indicating their importance in describing the extent to which the study sample represents its population. 4. Introducing the student to the most important statistical tests that he needs to compare between the variables of the study. 5. Explain the methods of measuring the correlation between variables.
Module Learning Outcomes	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. The course includes introducing the concept of biological statistics and explaining the scientific terminology 2. then moving to the concept of normal distribution in detail and clarifying its importance in biological statistics 3. and the extent to which statistical tests are adopted on. 4. After the we'll pass to the pure statistical topics that involves central tendency and dispersion measurements, the statistical methods in determining the size of the sample and how to collect it and ensure that it conforms to the statistical conditions such as the normal distribution, skewness and kurtosis, and its conformity with the criteria of its population. 5. the extent of the importance of these criteria in the statistical analysis and decision based on the analyzed results. 6. After that, we'll transfer to the parametric and non-parametric statistical tests, how to use each of them to compare the averages of the tested samples. 7. then we move to the methods of measuring the correlation between variables and the methods of statistical prediction using linear and multiple regression.
Indicative Contents	Indicative content includes the following. Part A – introduction to Biostatistics Data Tabulation and Graphic Representation, Explanation of Data Statistical Symbol, Measures of Central Tendency, Measures Dispersion and variance. [12 hrs] Part B- samples and Its Properties Measures of Confidence Intervals, Covariance Index, Measures of skewness and

	Kurtosis, Test the Normal Distribution and how to process Data that it is not Normally Distributed with Brief review of the Previous Topics. [12 h] Part C – Study the Relationship Between Variables (Correlation Coefficient) T-test, Chi Square Test. [6 h] Part D –Simple Linear Regression, Multiple Regression [6 h]

Learning and Teaching Strategies	
Strategies	This module will be delivered to the student through theoretical and practical lectures to clarify the basics of biostatistics and its importance in health informatics and encourage the student to get practice through participating in practical exercises and solving statistical problems using professional computer applications such as SPSS.

Student Workload (SWL)			
Structured SWL (h/sem)	48	**Structured SWL (h/w)**	3
Unstructured SWL (h/sem)	52	**Unstructured SWL (h/w)**	3.4
Total SWL (h/sem)	**100**		

Module Evaluation					
		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)

	Material Covered
Week 1	Introduction to Biostatistics
Week 2	Data tabulation and graphic representation
Week 3	Explanation of Statistical Symbols, Measures of Central Tendency
Week 4	Measures of dispersion and variance
Week 5	Sample and its properties, measurement of confidence intervals
Week 6	Covariance index, measures of skewness and Kurtosis
Week 7	Test the normal distribution and how to process data that is not normally distributed with a brief review of the previous Topics
Week 8	Assignment 1
Week 9	Test the normal distribution and how to process data that is not normally distributed with a brief review of the previous Topics
Week 10	Study the relationship between variables (correlation coefficient)
Week 11	T test
Week 12	chi square test
Week 13	Assignment 2
Week 14	Simple Linear Regression
Week 15	Multiple regression
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)

	Material Covered
Week 1	
Week 2	
Week 3	

Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

	Text	Available in the Library?
Required Texts	[1] Al-Rawi, Khashie M. 1984. Introduction to the statistcs. Univ. of Mousil press.	Yes
Recommended Texts	[2] Kallner A. 2014. LABORATORY STATISTICS. Elsevier Inc. USA. PP:139. [3] George D. and Mallery P. 2019. IBM SPSS Statistics 25 Step by Step. 14th ED. Taylor & Francis. USA. PP:386.	Yes
Websites		

Grading Scheme

Group	Grade		Marks %	Definition
Success Group (50 - 100)	**A** - Excellent		90 – 100	Outstanding Performance
	B - Very Good		80 – 89	Above average with some errors
	C - Good		70 – 79	Sound work with notable errors
	D - Satisfactory		60 – 69	Fair but with major shortcomings
	E - Sufficient		50 – 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail		(45-49)	More work required but credit awarded
	F – Fail		(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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Programming I**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**IMS103**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	IMS		**College**	CSIT	
Module Leader	Ali Z. Sharhan		**e-mail**	ali.zamil@uobasrah.edu.iq	
Module Leader's Acad. Title	Assist Lecturer		**Module Leader's Qualification**	MSc	
Module Tutor	Ali Z. Sharhan		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	2.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	IMS104 Computer Programming II	**Semester**	2/Level 1

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	**1.** Learn of programming languages provides added insight into other fields. **2.** Learn an understanding of the effective and responsible use and management of program language is important for managers and other business knowledge workers in today's global information Society. **3.** Learn that people must understand the components of programming langauge and how all of these components work together to bring value to an organization. **4.** We need to turn our attention to the role that programming language playin today's global information Society.. **5.** The competitiveness of most companies is in a large degree based on the effective use of information systems, therefore we must to think about what advantages and disadvantages Can bring to the businesses and society the integrating information system. **6.** what a programming languge ? A languge is a group of interrelated statement working together toward a common goal by accepting inputs and producing outputs in an organized transformation process **7.** why learing algorithm? **8.** why learing Flowchart? **9.** Why learn about Basic input/output? **10.** Why learn about loop type? - for..loop - while..loop **11.** Why Learn about functions? - Defining a Function, Calling a Function, Function Arguments (Call by value, Call by Reference)
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**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. **2-** Learn the most important skills to deal with if statement and nested if statement. **3-** Learn the most important skills to deal with for statement and nested for statement.(Loop types) **4-** Learn how to write and use the most important functions **5-** 10. Trace the execution of a variety of code segments and write summaries of their computations. **6-** 11. Identify common coding errors and apply strategies for avoiding such errors. **7-** 12. Apply a variety of strategies to the testing and debugging of simple programs. **8-** 13. Use of an appropriate IDE (Integrated Development Environment)

	to create, compile and run a program developed by the selected programing language.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following:** • Introduction to Programming & Problem-Solving • Algorithm Design • Flowcharts and Pseudocode • Data Types, Variables, Constants, and Literals • Basic Input/Output and Operators • Mathematical Functions and Strings • Decision-Making Statements (Selections) • Loop Types: While and For • Functions: Definition, Calling, Parameters (By Value, By Reference) • Debugging and Error Handling Basics • Project Development and Presentation

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Lectures to introduce fundamental programming concepts. • Hands-on lab sessions for practical programming exercises. • Tutorials to reinforce problem-solving skills and algorithmic thinking. • Project-based learning through small assignments and a final project presentation. • Use of an IDE to enhance students' programming, testing, and debugging experience. • Continuous formative assessments (quizzes, lab tasks, mini-project) to strengthen learning outcomes.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	97	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	3	10% (10)	7,11 and 14	LO #1, #2, #3 and #10, #11
	Assignments	2	10% (10)	3 and 13	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	14	LO #7, #8 and #10, #12
Summative assessment	**Midterm Exam**	1hr	10% (10)	9	LO #1 - #9
	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 programming language and problem - solving
Week 2	Algorithms design
Week 3	Flowcharts and pseudocode
Week 4	Python syntax, data types and variable types
Week 5	Constants / literals and basic input/output
Week 6	Mathematical functions and string operations
Week 7	Decision-making statements (selections)
Week 8	Selections (continued)
Week 9	**Midterm exam**
Week 10	Loop types (while..loop)
Week 11	Loop types (for ..loop)
Week 12	Functions
Week 13	Functions (continued)
Week 14	**Presentation of final mini - project**
Week 15	**Prepare to final exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to **Python** and **IDE** setup, run scripts.
Week 2	Write first programs
Week 3	Practice writing pseudocode & simple flowcharts; small group exercise.
Week 4	Working with Data Types and Variables
Week 5	Constants, Literals, and Basic Input/Output
Week 6	String parsing/Formatting tasks, numeric utilities
Week 7	If Statements
Week 8	Nested If Statements
Week 9	Midterm Exam (no lab)
Week 10	While loop examples
Week 11	For loop examples
Week 12	Functions (definition and calling)
Week 13	Functions (with parameters and practice)
Week 14	Project work & Quiz
Week 15	Final Exam *(no lab)*

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Liang, Y. D. (2013). Introduction to programming using Python. Pearson.	No
Recommended Texts	Matthes, E. (2023). Python crash course: A hands-on, project-based introduction to programming. no starch press.	No
Websites	https://www.guru99.com/pythontutorials.html https://www.w3schools.com/python/python_intro.asp	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (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 (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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Fundamentals**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory**	
Module Code	**IMS105**			☒ **Lecture**	
ECTS Credits	**5**			☐ **Lab**	
SWL (hr/sem)	**125**			☐ **Tutorial**	
				☐ **Practical**	
				☐ **Seminar**	
Module Level	1	**Semester of Delivery**	1		
Administering Department	IMS	**College**	CSIT		
Module Leader	Dr. Mustafa Moosa Qasim	**e-mail**	mustafa_mq87@uobasrah.edu.iq		
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.		
Module Tutor	Dr. Mustafa Moosa Qasim	**e-mail**	E-mail		
Peer Reviewer Name	Name	**e-mail**	E-mail		
Scientific Committee Approval Date		**Version Number**	2.0		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	No	**Semester**	
Co-requisites module	No	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To learn and understand how computer systems work. 2. To learn and understand computer terminology. 3. To understand an overview of the history of computers. 4. To overview the basic types of computers in use today. 5. To learn about the organization and architecture of computers. 6. To understand input and output devices. 7. To learn and understand storage devices. 8. To learn hardware and software computer systems. 9. To learn computer number systems and data representations. 10. To learn and understand what computers are and how they are used. 11. To describe the parts of typical desktop personal computers. 12. To describe the computer users and professionals. 13. To learn and understand how computers fit every need. 14. To describe the inside of the system unit in detail. 15. To learn and understand the PC Technician Professional Best Practices. 16. To learn and understand the operating system fundamentals. 17. To discuss the various types of optical discs available and how they differ from each other. 18. To describe the essential elements and duties of computer operating systems. 19. To learn and understand the Microsoft Windows installations, which are maintained, configured, and installed. 20. To learn and understand a brief overview of the architectural analysis of computer systems and their components, including the execution unit, arithmetic and logical (ALU) unit, and memory unit. 21. To learn and understand the General Properties of Storage Systems 22. To provide more details about understanding how to use computers today and tomorrow.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Identify the components of standard desktop personal computers. 2. Identify fundamental components and functions of personal computer operating systems. 3. Identify best practices followed by professional personal computer technicians. 4. Install and configure computer components. 5. Install and configure system components. 6. Maintain and troubleshoot peripheral components. 7. Troubleshoot system components. 8. Install and configure operating systems. 9. Maintain and troubleshoot installations of Microsoft Windows.

	10. Students will be introduced to the design and analysis of a computer system's hardware and its components, including the execution unit, arithmetic and logical (ALU) unit, and memory unit. 11. Understanding how to use computers today and tomorrow in our lives. 12. The ability to learn and work in groups.
Indicative Contents المحتويات الإرشادية	**1. What computers are, how they are used.** • An overview of the history of computers. • Computer terminology. • The basic types of computers in use today. • Describe the parts of typical desktop personal computers System Unit Components. • Hardware in general. • Software in general. **2. How are Computers to Fit Every Need.** • Computer Users and Professionals. • Categories of computers. • Embedded Computers in detail with examples. • Personal Computers in detail with examples. • Mobile Devices in detail with examples. • Portable Computers in detail with examples. • Describe Inside the system unit. **3. Personal Computer Technician Professional Best Practices.** • Digital Data Representation. • Processing Speed. • Bus Width, Bus Speed, and Bandwidth. • Memory details. • Logical vs. Physical Representation. • Diagnostics and Troubleshooting. **4. Operating System Fundamentals** • Personal Computer Operating Systems. • Windows User Interface Components. • Windows File System Management. • Windows System Management Tools. **5. Installing and Configuring Peripheral Components.** • Install and Configure Display Devices. • Install and Configure Input Devices. • Install and Configure Adapter Cards. • Install and Configure Multimedia Devices.

	6. Maintaining and Troubleshooting Peripheral Components. • Troubleshoot Display Devices. • Maintain and Troubleshoot Input Devices. • Troubleshoot Adapter Cards. • Troubleshoot Multimedia Devices. **7. Troubleshooting System Components.** • Troubleshoot Power Supplies. • Troubleshoot Memory. • Troubleshoot CPUs. • Troubleshoot System Boards. **8. Installing and Configuring Operating Systems.** • Install Microsoft Windows. • Upgrade Windows. • Add Devices to Windows. • Optimize Windows. **9. Introduction to Computer Architecture.** • Hardware, Software, and Firmware. • Basics of Computer Architecture. • Computer Structures. **10. Computer Instruction Set.** • Instruction Types. ➢ Data Transfer Instructions. ➢ Arithmetic Instructions. ➢ Logical Instructions. ➢ Program-control Instructions. ➢ System-control Instructions. • I/O Instructions. **11. Memory Organization**. • Memory definition. • Memory Types. • RAM Types. • ROM Types. • Difference between RAM and ROM. **12. General Properties of Storage Systems.** • Describe the two most common types of hard drives and what they are used for today. • Discuss the various types of optical discs available and how they differ from each other. • Identify some flash-memory-based storage devices and media and explain how they are used today.

	• List at least three other types of storage systems. **13. Understanding how to use Computers Today and Tomorrow in our Life.** • Examples with case study.
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, interactive tutorials, and solving exercises.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (hr/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (hr/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (hr/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	**Unstructured SWL (hr/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (hr/sem) 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	#1، #3، #7 و #8
	Assignments	2	10% (10)	2 - 12	#3، #4، #6 ، و #7
	Projects / Lab.	1	10% (10)	Continuous	All

	Report	1	10% (10)	13	#5, #8 and #10
Summative assessment	**Midterm Exam**	1hr	10% (10)	10	#1 - #7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1,2	What computers are, how they are used.
Week 3	How are Computers to Fit Every Need.
Week 4	Personal Computer Technician Professional Best Practices.
Week 5	Operating System Fundamentals.
Week 6	Installing and Configuring Peripheral Components.
Week 7	Maintaining and Troubleshooting Peripheral Components.
Week 8	Troubleshooting System Components.
Week 9	Installing and Configuring Operating Systems.
Week 10	**Mid-term Exam.**
Week 11	Introduction to Computer Architecture.
Week 12	Computer Instruction Set.
Week 13	Memory Organization.
Week 14	General Properties of Storage Systems.
Week 15	Understanding how to use Computers Today and Tomorrow in our Life.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	First Look at Computer Parts and Tools
Week 2	Introducing Windows Operating Systems
Week 3	All about Motherboards & Supporting Processors and Upgrading Memory
Week 4	Supporting Hard Drives
Week 5	Installing Windows
Week 6	Satisfying Customer Needs
Week 7	PC Maintenance and Troubleshooting Strategies
Week 8	Maintaining Windows and Optimizing Windows
Week 9	Troubleshooting Windows and Applications and Troubleshooting Windows Startup Problems
Week 10	**Mid-term Exam.**
Week 11	Introduction To Microsoft Word 2021
Week 12	Introduction To Microsoft Excel 2021
Week 13	Introduction To Microsoft PowerPoint 2021
Week 14	Exercises and tutorials.
Week 15	Exercises and tutorials.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. (Wiley series on parallel and distributed computing) Abd-El-Barr M., El-Rewini H. - Fundamentals of Computer Organization and Architecture-Wiley (2005) 2. Michael Meyers-Mike Meyers CompTIA A+ Guide_ Essentials Lab Manual, Third Edition (Exam 220-701) (Mike Meyers' Computer Skills) (2010) 3. CH Roth Jr, LL Kinney, EB John. Fundamentals of logic design- Cengage Learning (2013) 4. Morley, Deborah, and Charles S. Parker. Understanding computers: Today and tomorrow, comprehensive. Cengage Learning, (2010)	No (E-copy)

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (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
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Fail Group (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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Biology**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	IMS106				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level		1	**Semester of Delivery**		1
Administering Department		IMS	**College**	CSIT	
Module Leader	Labeed Abdullah Najim Al-Saad		**e-mail**	labeed.najim@uobasrah.edu.iq	
Module Leader's Acad. Title		lecturer	**Module Leader's Qualification**		Ph.D.
Module Tutor	Amani Hussain Hameed		**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**		2.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	Anatomy, Physiology, and Bioinformatics	**Semester**	2

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	• Describe levels of organization and related functions in plants and animals. • Identify the characteristics and basic needs of living organisms and ecosystems. • Explain the processes of growth and development in individuals and populations. • Design and critically assess the scientific investigations they perform. • Demonstrate critical thinking skills.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	• Define clearly what is meant by "life" and "living organisms". • Explain why biology on Earth is based on the chemistry of carbon and analyze the potential for biology based on other elements. • Define basic biological concepts and processes. • Describe levels of organization and related functions in plants and animals. • Identify the characteristics and basic needs of living organisms. • Explain the processes of growth and development in individuals and populations. • Describe the relationships between organisms and their environment. • Outline the structure of the biomolecules found in all living organisms. • Describe the function and structure of cells including the metabolic reactions that occur in cells. • Explain the process of inheritance. • Describe how RNA, DNA and proteins are synthesized. • Explain the process of cell division in both somatic and germ cells. • Explain the processes by which animals acquire nutrients, water and oxygen, eliminate wastes, protect against foreign substances, acquire information about their environment and reproduce. • Generate a hypothesis from a set of observations and then design experiments to test the hypothesis. • Connect everything mentioned above to computer science and the concept of computational biology.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Each section begins with an overview, which puts the topic into a broader biological context and encourages understanding of the place of each topic within the subject. The overview is intended to encourage an overarching approach to both the teaching and learning of topic areas. As such, it will not be directly assessed. These specifications contains the specification content that all students must cover and that can be assessed in written papers and opportunities for skills to be developed throughout the course.

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, 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			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.7
Total SWL (h/sem) 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.	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 biology

Week 2	The Cell
Week 3	The Cell
Week 4	Key Biomarkers for Cell Organelles and Their Employment in Intelligent Medical Systems Applications
Week 5	Prokaryotes and Eukaryotes
Week 6	Mitosis and mitosis
Week 7	Mitosis and mitosis
Week 8	Mid Exam
Week 9	Tissue types, epithelial tissue, connective tissue, muscular tissue, smooth tissue
Week 10	Tissue types, epithelial tissue, connective tissue, muscular tissue, smooth tissue
Week 11	Biological Macromolecules, carbohydrate, protein, lipids
Week 12	Nucleic acid, DNA, RNA
Week 13	DNA Replication
Week 14	Nucleic Acid Investigation Techniques
Week 15	**Final Exam**
Week 16	

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Laboratory safety
Week 2	Parts of microscope
Week 3	Types of cells, mitosis and meiosis
Week 4	Tissue types
Week 5	Human Blood, W.B.C , R.B.C
Week 6	Practical Python Lab Lecture: Core Biomarker Analysis: Diabetes Screening with Blood Glucose
Week 7	Practical Python Lab Lecture: Core Biomarker Analysis: Multi-Biometer Panel for Vital Signs

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**

Required Texts	Biology by Neil A. Campbell	No
Recommended Texts	Biological Science by Scott Freeman, Kim Quillin, Lizabeth Allison, Michael Black, and Emily Taylor Python Programming for Biology: Bioinformatics and Beyond, Tim J. Stevens and Wayne Boucher. 2015 Python for Biologists: A Complete Programming Course for Beginners, Dr. Martin Jones. 2013	No
Websites	https://alleninstitute.org/materials-library/?gad_source=1&gclid=Cj0KCQiAo7KqBhDhARIsAKhZ4ujCQ0oRF-RqtBSnSMMb2n30NK4k0N7RbXqyp44u4rckPZzaLPb8cb8aAui7EALw_wcB https://www.pythonforbiologists.org/	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (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 (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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Medical Terminology**			**Module Delivery**	
Module Type	**Core**			☐ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**IMS107**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level			**Semester of Delivery**	1	
Administering Department	IMS		**College**	CSIT	
Module Leader	Firas Jabbar Taresh		**e-mail**	Firas.j.taresh@stu.edu.iq	
Module Leader's Acad. Title	Assist. Lec		**Module Leader's Qualification**	MSc	
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	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To have an idea about common terminology in medicine 2. To have knowledge about applied terms 3. This course deals with the basic concept of terminology. 4. This is the basic subject for all medical terms related to body system. 5. To understand terms in concern of medical physics. 6. To know statistical terms of medicine.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. Recognize how to use medical terms in their corresponding issue. 2. List the various terms associated with diseases, diagnosis and therapy. 3. Know the synonyms of medical terminology. 4. Discuss abbreviations of medical terminology. 5. Describe applied human anatomy. 6. Define informative biomedicine. 7. Identify special words when writing papers. 8. Discuss research parameters. 9. Discuss citation in medical publications. 10. Explain terms related to medical and laboratory tests. 11. Identify terms of medical tools.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A Introduction [15 hrs] history of medicine English language, story-based medicine, disease story [15 hrs] biomedical perspectives ideas and believes, worries, disease illness model, body systems, patient language and doctor language, open and closed interview, listening in medical practice [10 hrs]. skills, professionality tradional medical history psychosocial orientation Summarization, Part B – clinical data, laboratory data, medical terms, 15h

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Flipped class will be considered as teaching strategy

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدرا يس المنتظم للطالب خلال الفصل	31	**Structured SWL (h/w)** الحمل الدرا يس المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem)	69	**Unstructured SWL (h/w)** الحمل الدرا يس غ ري المنتظم للطالب أسبوعيا	4.6

الحمل الدرا يس غ ري المنتظم للطالب خلال الفصل			
Total SWL (h/sem) الحمل الدرا يس الك يل للطالب خلال الفصل	100		

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**	2 hr	10 % (10)	7	LO #1 - #7
	Final Exam	3 hr	50 % (50)	16	All
Total assessment			100% (100) Mark		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction – History of Medicine
Week 2	Medical communication and interviewing skills
Week 3	Health and Disease definition with disease progression
Week 4	Health environment relevant to sterilization in health centers
Week 5	Library and information technology
Week 6	Terms of applied human anatomy
Week 7	Patient language and doctor language
Week 8	Terms related to posture, examination, and laboratory investigations
Week 9	Interpretation of data outcome
Week 10	Clinical data
Week 11	Patient perspective
Week 12	Biomedical perspective
Week 13	Medical conversation technique, patient relevant interview and history taking

Week 14	Synonymous and abbreviations
Week 15	Medical conventional dictionary

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	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamentals of Medicine	Yes
Recommended Texts		No
Websites		

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
Success Group (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 (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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Programming II**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**IMS104**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		1	**Semester of Delivery**		2
Administering Department		IMS	**College**	CSIT	
Module Leader	Ali Z. Sharhan		**e-mail**	ali.zamil@uobasrah.edu.iq	
Module Leader's Acad. Title		Assist Lecturer	**Module Leader's Qualification**		MSc
Module Tutor	Ali Z. Sharhan		**e-mail**	ali.zamil@uobasrah.edu.iq	
Peer Reviewer Name		Name	**e-mail**	E-mail	
Scientific Committee Approval Date			**Version Number**	2.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	IMS103 Computer Programming II	**Semester**	2/ Level 1
Co-requisites module	IMS206 Data structures and Algorithms	**Semester**	1/ Level 2

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	**1-** To strengthen students' understanding of Python programming constructs and their applications in computational problem solving. **2-** To develop the ability to design, implement, and test efficient Python programs using loops, functions, strings, and arrays. **3-** To introduce File Handling in Python, enabling students to store, retrieve, and process external data. **4-** To provide an introductory understanding of Basic Data Structures (Lists, Tuples, Dictionaries, and Sets) for solving structured problems. **5-** To enhance critical thinking, logical reasoning, and programming skills through theory, lab practice, and applied assignments.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	**Upon successful completion of this module, students will be able to:** **1-** Demonstrate a solid understanding of Python programming constructs (loops, functions, strings, arrays). **2-** Apply programming knowledge to design, write, and test Python solutions for computational problems. **3-** Implement and manipulate file input/output operations in Python. **4-** Apply basic data structures (Lists, Tuples, Dictionaries, Sets) in solving real-world tasks. **5-** Exhibit independent problem-solving skills and the ability to work on applied programming projects.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following:** • Review of Python fundamentals: variables, operators, input/output. • Control structures: if, nested if, for loop, while loop, nested loops. • Functions: definition, parameters, arguments, return values, scope. • Strings: declaration, operations, and built-in functions. • Arrays: one-dimensional and two-dimensional arrays (declaration and functions). • **File Handling in Python:** reading, writing, and appending text files. • **Basic Data Structures:** introduction to Lists, Tuples, Dictionaries, and Sets.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	• Lectures for core concepts and examples. • Weekly hands-on lab sessions aligned with theory topics. • Assignments and small programming tasks for formative assessment. • A term project (individual or group) with milestones and final presentation. • Use of IDEs and version control basics (recommended: Git basics). • Peer review and short code walk-throughs to develop reading/debugging skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	97	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	3	10% (10)	7,11 and 14	LO #1, #2, #3 and #10, #11
	Assignments	2	10% (10)	3 and 13	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	14	LO #7, #8 and #10, #12
Summative assessment	**Midterm Exam**	1hr	10% (10)	9	LO #1 - #9
	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 Programming II – review of Python basics
Week 2	Looping structures: for, while, nested, break/continue
Week 3	Loop applications (patterns and series integration)
Week 4	Functions: definition, parameters, return values
Week 5	Functions with loop applications
Week 6	Strings: declaration, manipulation, and functions
Week 7	**Midterm Exam**
Week 8	One-dimensional arrays: introduction and applications
Week 9	Two-dimensional arrays: introduction and applications
Week 10	Functions with arrays
Week 11	Basic Data Structures (Lists & Tuples)
Week 12	Basic Data Structures (Dictionaries & Sets)
Week 13	File Handling in Python
Week 14	**Project Presentation and Discussion**
Week 15	**Final Exam Review**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	practice on looping structures
Week 2	Loop applications (patterns and series)
Week 3	problem-solving with loops
Week 4	functions (definition and usage)
Week 5	Functions with loop applications
Week 6	String operations and built-in functions
Week 7	One & Two dimensional arrays (implementation)
Week 8	**Midterm Exam – *No Lab***
Week 9	One & Two dimensional arrays (countinued)

Week 10	functions with arrays
Week 11	Lists and Tuples (storing and processing structured data)
Week 12	Dictionaries and Sets (key-value and unique data handling)
Week 13	File handling (open, read, write and append files)
Week 14	**Quiz**
Week 15	**Project Presentation and Discussion**

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Liang, Y. D. (2013). Introduction to programming using Python. Pearson.	No
Recommended Texts	Barry, P. (2016). Head first Python: A brain-friendly guide. " O'Reilly Media, Inc.".	No
Websites	Official Python Documentation: https://docs.python.org/3 Additional Python Notes and Tutorials: https://www.geeksforgeeks.org/python/python-programming-language-tutorial/	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (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 (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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Logic Design**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**IMS108**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	IMS		**College**	CSIT	
Module Leader	Dr. Mustafa Moosa Qasim		**e-mail**	mustafa_mq87@uobasrah.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	Ph.D.	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	2.0	

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	
Module Objectives أهداف المادة الدراسية	This course primarily helps students prepare for professional work in the field of logic design. Students should be able to apply knowledge of science and engineering, as well as the number systems method, where each number is represented by a string of symbols where each symbol is associated with a specific weight depending upon its position. Additionally, the course will cover techniques, skills, and modern engineering tools for analyzing, designing, and optimizing 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 and its principles of operation, analysis, and design. In short, they will learn how to use this knowledge to better adjust the level of technology content for both electrical and computer engineering and computer science students in the department of intelligent medical systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon completion of the course, students will be able to: 1. Using number systems, and it applies to the material of logic systems. 2. Be familiar with truth tables and how to use them for analysis and design. 3. Using switching algebra and the implementation of switching functions using the common gates AND, OR, NOT, NAND, NOR, Exclusive-OR, and Exclusive-NOR. 4. Simplification of combinational logic circuits by using a Karnaugh map. 5. Analyze and design larger combinational logic circuits. 6. Analyze sequential logic circuits. 7. Ability to analyze and design a system, component, or process to meet desired needs. 8. Ability to analyze, design, and conduct experiments. 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 analyzing real problems through laboratory experiments. 10. The ability to apply their skills in a variety of practical sciences.
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. • Five and six-variable Karnaugh map. • Economize by sharing gates. **5. Designing Combinational system.** • Design 1-bit and 2-bits full adder design 1-bit subtractor. • Subtractor/ adder. • Comparators. • Binary decoders.

	• Binary encoder. • Multiplexe and Demultiplexe. **6. Analysis of sequential systems.** • D, S-R, T. • J-K flip flops. • flip flop with clear and present inputs, timing for flip flop. • Moore model circuit. • Mealy model analysis.

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 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 mission 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.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

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

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Number Systems.
Week 2	Number Systems.
Week 3	Number Systems.
Week 4	Number Systems.
Week 5	Combinational Logic Circuits and switching algebra.
Week 6	Combinational Logic Circuits and switching algebra.
Week 7	Switching algebra and logic gates.
Week 8	Switching algebra and logic gates.
Week 9	Switching algebra and logic gates.
Week 10	**Mid-term Exam.**
Week 11	Karnaugh map.
Week 12	Karnaugh map.
Week 13	Designing Combinational system.
Week 14	Designing Combinational system.
Week 15	Designing Combinational system.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Logic circuit design software and installation method.
Week 2	Learning how to choose the appropriate software of in logic circuits design that are easy to use and have sustainability. Learning how to use interfaces of logic circuits design program.
Week 3	Introduction Logic Gates. AND Gate and Logic Diagram. Examples with Exercises.
Week 4	OR Gate and Logic Diagram. Examples with Exercises.
Week 5	NOT Gate and Logic Diagram. Examples with Exercises.
Week 6	NAND Gate and Logic Diagram. Examples with Exercises.
Week 7	NOR Gate and Logic Diagram. Examples with Exercises.
Week 8	XOR Gate and Logic Diagram. XNOR Gate and Logic Diagram. Examples with Exercises.
Week 9	Logic circuits and solving problems. Drawing the truth table from a given logic circuit. Designing a logic circuit from a given problem and testing it by also drawing a truth table.

	Examples with Exercises.
Week 10	**Mid-term Exam.**
Week 11	Boolean Algebra. Distributive Law. Rules of Boolean Algebra. Boolean Expression/Function. Examples with Exercises.
Week 12	De Morgan's Theorems. Examples: using Boolean Algebra techniques Learn how to Work in groups. Examples with Exercises.
Week 13	Standard Form of Boolean Expressions All Boolean expressions, regardless of their form, can be converted into two standard forms: ▪ The sum- of – products form. ▪ The product –of- sums form. Examples with Exercises.
Week 14	How to construct Full -Adder from two Half –Adders with Logic circuit Examples with Exercises.
Week 15	Exercises in general. • Work in groups
Week 16	**Preparatory week before the final Exam through test students.**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. Textbook 1: M. Morris Mano.," Digital Design", Published by McGraw-Hill, 3rd edition (2004) 2. Morris Mano M, "Digital Logic and Computer Design", Prentice Hall, New Delhi (2006). 3. Alan B. Marcovitz - Introduction to Logic Design, 3rd Edition -McGraw-Hill (2009). 4. Charles H. Roth Jr., Larry L Kinney - Fundamentals of Logic Design, 6th Edition-CL Engineering (2009).	No

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (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 (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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Bioinformatics**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**IMS109**				
ECTS Credits	**7**				
SWL (hr/sem)	175				
Module Level		1	**Semester of Delivery**		2
Administering Department		IMS	**College**		CSIS
Module Leader	Dr. Labeed Abdullah Najim Al-Saad				Labeed.najim@uobasrah.edu.iq
Module Leader's Acad. Title		Assist Proff	**Module Leader's Qualification**		PhD
Module Tutor			**e-mail**		E-mail
Peer Reviewer Name			**e-mail**		E-mail
Scientific Committee Approval Date			**Version Number**		2.0

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	
Module Objectives أهداف المادة الدراسية	The aim of this module is to provide students with the skills, knowledge, and practical experience to leverage computational tools and techniques for analyzing biological data and advancing biological research. The objectives: 1. Understanding Biological Data. 2. Developing Computational Skills. 3. Introduction to Bioinformatics Tools and Databases. 4. Sequence Analysis: Teach students how to analyze and interpret DNA and protein sequences.. 5. Structural Bioinformatics: Introduce students to the analysis and prediction of protein structures. 6. Genomic Data Analysis: Provide students with the skills to analyze and interpret high-throughput genomic data, such as next-generation sequencing data and microarray data. 7. Systems Biology and Network Analysis: Teach students how to analyze biological systems at a network level. 8. Data Integration and Visualization.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Equip students with the necessary computational and programming skills to manipulate, analyze, and interpret biological data. This includes proficiency in programming languages (such as Python or R), statistical analysis, data visualization, and database querying.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Introduction to Bioinformatics: • Overview of bioinformatics and its applications • Introduction to biological data types and databases • Introduction to programming languages and tools used in bioinformatics (Python, R, and command-line tools) Sequence Analysis: • Introduction to DNA, RNA, and protein sequences • Sequence alignment algorithms and applications • Database searching and sequence retrieval (BLAST) • Motif discovery and prediction Structural Bioinformatics: • Protein structure prediction methods • Protein structure databases and visualization tools • Structure alignment and comparison • Protein function prediction Genomic Data Analysis: • Introduction to genomics and high-throughput sequencing technologies • Preprocessing and quality control of sequencing data • Genome assembly and annotation • Variant calling and analysis Gene Expression Analysis: • Introduction to transcriptomics and microarray data

	• Preprocessing and normalization of gene expression data • Differential gene expression analysis • Functional enrichment analysis Systems Biology and Network Analysis: • Biological network representation and analysis • Pathway analysis and gene set enrichment analysis • Introduction to systems biology and modeling approaches Data Integration and Visualization: • Data integration from multiple sources • Data mining and feature selection techniques • Data visualization methods for biological data Next-Generation Sequencing (NGS) Data Analysis: • Introduction to NGS data analysis pipelines • ChIP-seq analysis for studying protein-DNA interactions • RNA-seq analysis for gene expression quantification and isoform discovery Metagenomics and Comparative Genomics: • Introduction to metagenomics and analysis of microbial communities • Comparative genomics and evolutionary analysis • Phylogenetic analysis and tree construction Ethical and Legal Considerations in Bioinformatics: • Data privacy and security in bioinformatics research • Intellectual property rights and data sharing policies Project Work: Students will work on bioinformatics projects, applying the concepts and tools learned throughout the course. Projects can include data analysis, algorithm implementation, or research-based investigations.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Blended Learning Approach: Incorporate a mix of instructional methods, including lectures, hands-on practical sessions, group discussions, and online resources. This approach provides a balance between theoretical knowledge and practical application, catering to different learning styles. 2. Project-Based Learning: Integrate project-based learning activities where students can apply bioinformatics techniques to real-world problems. This hands-on approach fosters critical thinking, problem-solving skills, and encourages active participation. 3. Collaborative Learning: Encourage collaboration and teamwork among students by incorporating group projects, discussions, and peer-to-peer learning activities. This allows for the exchange of ideas, sharing of knowledge, and the development of interpersonal and communication skills.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	96	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.4
Total SWL (h/sem) 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 #2-#8
	Assignments				
	Projects / Lab.	1	10% (10)	Continuous	LO #1- #8 and #10
	Report	1	10% (10)	13	LO #1- #8 and #10
Summative assessment	**Midterm Exam**	2hr	20% (20)	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 bioinformatics and its applications
Week 2	Genomic Data Analysis_part 1
Week 3	Genomic Data Analysis_part 2
Week 4	Sequence analysis_Part1
Week 5	Sequence analysis_Part2
Week 6	Structural Bioinformatics_Part1
Week 7	Structural Bioinformatics_Part2
Week 8	Midterm examination

Week 9	Gene Expression Analysis 1
Week 10	Gene Expression Analysis 2
Week 11	Systems Biology and Network Analysis
Week 12	Next-Generation Sequencing (NGS) Data Analysis
Week 13	Ethical and Legal Considerations in Bioinformatics
Week 14	Project work
Week 15	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	R basics – Introduction, installation, GUI
Week 2	R basics – Variables, basic commands
Week 3	R basics – R packages, download, installation, employment
Week 4	Sequence processing (Using R)
Week 5	**Basic Local Alignment Search Tool** (**BLAST**) Part1
Week 6	**Basic Local Alignment Search Tool** (**BLAST**) Part2.
Week 7	**Multible sequence Alignment (Using R)**
Week 8	Lab4: Phylogenetic analysis part1
Week 9	Lab5: Phylogenetic analysis part2
Week 10	Final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Textbook: "Bioinformatics: Sequence and Genome Analysis" by David W. Mount	Yes
Recommended Texts		Yes
Websites	Online resources: NCBI, Ensembl, UniProt, BLAST, ClustalW, MEGA, R, Python, and other bioinformatics tools and databases	

Grading Scheme مخطط الدرجات				
Group	**Grade**	التقدير	**Marks %**	**Definition**
Success Group (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 (0 – 49)	**FX –** Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Anatomy**			**Module Delivery**	
Module Type	**Core**			☐ **Theory** ☐ **Lecture** ☐ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**IMS110**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level			**Semester of Delivery**	2	
Administering Department	IMS		**College**	CSIT	
Module Leader	Firas Jabbar Taresh		**e-mail**	Firas.j.taresh@stu.edu.iq	
Module Leader's Acad. Title	Assit .Lec		**Module Leader's Qualification**	MSc	
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	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	objectives of a human Anatomy course include: - To introduce students to the components and structures of the human body at the level of gross and microscopic anatomy. - To provide students with an understanding of the functional characteristics of human life and the four requirements for human survival. - To teach students the six levels of organization of the human body and the structure of the body from simplest to most complex. - To help students distinguish between anatomy and physiology and identify several branches of each. - To explain the importance of homeostasis to normal human functioning. - To introduce students to the relevance of anatomy to numerous aspects of their future professional practice. - To provide students with the knowledge and skills necessary to identify anatomical structures and understand physiological processes. - To teach students how to make healthful choices and prompt them to take appropriate action when signs of illness arise. - To prepare students for careers in the health professions that require an understanding of anatomy and physiology.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Distinguish between anatomy and physiology and identify several branches of each. - Describe the structure of the body, from simplest to most complex, in terms of the six levels of organization. - Identify the functional characteristics of human life and the four requirements for human survival. - Define homeostasis and explain its importance to normal human functioning. - Identify the components and structures of the human body at the level of gross and microscopic anatomy. - Identify anatomical structures and understand physiological processes. - Understand the relevance of anatomy to numerous aspects of future professional practice, such as diagnosis, physical examination, record keeping, and writing letters. - Make healthful choices and take appropriate action when signs of illness arise. Prepare for careers in the health professions that require an understanding of anatomy and physiology.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: - Introduction to anatomy: - Definition of anatomy and physiology - Overview of the human body and its organization - Levels of organization in the human body - Anatomical terminology and directional terms

	Body planes and sections Body cavities and membranes Histology: study of tissues Integumentary system: skin, hair, and nails Skeletal system: Overview of the skeletal system Types of bones: long, short, flat, and irregular Bone structure: periosteum, compact bone, spongy bone, and bone marrow Bone cells: osteoblasts, osteocytes, and osteoclasts Bone growth and development: intramembranous and endochondral ossification Bone remodeling and repair Joints: types and functions Axial skeleton: skull, vertebral column, and thoracic cage Appendicular skeleton: upper and lower limbs, pectoral and pelvic girdles Skeletal system and movement: muscles, tendons, and ligaments Skeletal system and protection: skull, rib cage, and vertebral column Muscular system: Overview of the muscular system Types of muscle tissue: skeletal, smooth, and cardiac Structure and function of skeletal muscle fibers Organization of skeletal muscle: fascicles, muscle fibers, myofibrils, and sarcomeres Sliding filament theory of muscle contraction Neuromuscular junction and muscle contraction Energy metabolism in muscle cells Muscle fiber types and their characteristics Muscles of the head and neck Muscles of the trunk and limbs Muscle actions and their effects on movement Nervous system: Overview of the nervous system Neurons: structure and function Glial cells: structure and function Nerve impulses and action potentials Synaptic transmission and neurotransmitters Central nervous system: brain and spinal cord Peripheral nervous system: cranial and spinal nerves Autonomic nervous system: sympathetic and parasympathetic divisions Sensory systems: somatic and special senses

	▯ Motor systems: somatic and autonomic ▯ Endocrine system: ▯ Overview of the endocrine system ▯ Endocrine glands and their functions ▯ Hormones and their chemical properties ▯ Hormone synthesis, storage, and release ▯ Hormone transport and distribution ▯ Hormone receptors and signaling pathways ▯ Hypothalamus-pituitary axis and its regulation of endocrine function ▯ Thyroid gland and its hormones ▯ Parathyroid gland and its hormone ▯ Adrenal gland and its hormones ▯ Pancreas and its hormones ▯ Gonads and their hormones ▯ Endocrine system and homeostasis ▯ Cardiovascular system: ▯ Overview of the cardiovascular system ▯ Structure and function of the heart ▯ Blood vessels: arteries, veins, and capillaries ▯ Blood flow and circulation ▯ Cardiac cycle and heart sounds ▯ Electrical conduction system of the heart ▯ Regulation of heart rate and blood pressure ▯ Coronary circulation and heart disease ▯ Lymphatic system and its relationship to the cardiovascular system ▯ Respiratory system: ▯ Overview of the respiratory system ▯ Upper respiratory tract: nose, pharynx, and larynx ▯ Lower respiratory tract: trachea, bronchi, bronchioles, and alveoli ▯ Mechanics of breathing: inspiration and expiration ▯ Pulmonary circulation and gas exchange ▯ Control of respiration: neural and chemical regulation ▯ Digestive system: ▯ Overview of the digestive system ▯ Organs of the digestive system: mouth, pharynx, esophagus, stomach, small intestine, large intestine, rectum, and anus ▯ Tissue layers of the digestive system: mucosa, submucosa, muscularis externa, and serosa ▯ Accessory digestive organs: salivary glands, liver, gallbladder, and pancreas ▯ Digestive processes: ingestion, propulsion, mechanical and chemical

	digestion, absorption, and defecation Regulation of digestive processes: neural and hormonal mechanisms Urinary system: Overview of the urinary system Kidneys: structure and function Nephrons: structure and function Urine formation: filtration, reabsorption, and secretion Ureters: structure and function Bladder: structure and function Urethra: structure and function Micturition reflex: neural control of urination Reproductive system: Overview of the male and female reproductive systems Male reproductive system: penis, scrotum, testes, epididymis, vas deferens, prostate, and seminal vesicles Female reproductive system: ovaries, fallopian tubes, uterus, cervix, vagina, and vulva Gametogenesis: spermatogenesis and oogenesis Hormonal regulation of the reproductive system: hypothalamus-pituitarygonadal axis Integumentary system: Overview of the integumentary system Skin layers: epidermis, dermis, and hypodermis Skin appendages: hair, nails, and glands Skin functions: protection, sensation, thermoregulation, vitamin D synthesis, and excretion Skin color and pigmentation

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Lectures: Instructors can use lectures to introduce students to the basic concepts and structures of anatomy. 2. Laboratory work: Laboratory work can provide students with hands-on experience in identifying anatomical structures and understanding physiological processes. 3. Research projects: Research projects can help students deepen their understanding of specific topics in anatomy and apply their knowledge to realworld problems. 4. Problem-based learning: Problem-based learning can be used to help students develop critical thinking skills and apply their knowledge of anatomy to solve clinical problems.

	5. Clinical orientation: Anatomy instruction can be made more effective by providing context for students. 6. Learning objectives: Instructors can use learning objectives to guide students in their learning and help them focus on the most important concepts and structures of anatomy. 7. Assessment activities: Assessment activities, such as exams, quizzes, and research papers, can be used to measure student learning outcomes and provide feedback to students on their progress.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدرا يس المنتظم للطالب خلال الفصل	64	**Structured SWL (h/w)** الحمل الدرا يس المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدرا يس غ ري المنتظم للطالب خلال الفصل	36	**Unstructured SWL (h/w)** الحمل الدرا يس غ ري المنتظم للطالب أسبوعيا	2.4
Total SWL (h/sem) الحمل الدرا يس الك يل للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10 % (10)	5 and 10	LO #5, #9
	Assignments	1	10 % (10)	1	LO #1-#6
	Projects / Lab.	1	10 % (10)	1	
	Report				
Summative assessment	**Midterm Exam**	2 hr	10 % (10)	1	LO #1 - #6
	Final Exam	3 hr	50 % (50)	1	All
Total assessment			100% (100) Mark		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to anatomy and histology
Week 2	Skeletal system

Week 3	Muscular system
Week 4	Nervous system
Week 5	Endocrine system
Week 6	Cardiovascular system
Week 7	Midterm exam
Week 8	Respiratory system
Week 9	Digestive system
Week 10	Urinary system
Week 11	Reproductive system
Week 12	Integumentary system: skin, hair, and nails
Week 13	Integration of physiological systems part 1
Week 14	Integration of physiological systems part 2
Week 15	Review to prepare for final exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Anatomy and Physiology - Overview of the human body and its organization - Six levels of organization - Functional characteristics of human life - Four requirements for human survival - Homeostasis and its importance
Week 2	Skeletal System - Types of bones and their functions - Bone structure and cells - Bone growth and development - Joints and their types
Week 3	Muscular System - Types of muscle tissue

	▯ Muscle structure and function ▯ Sliding filament theory of muscle contraction ▯ Neuromuscular junction and muscle contraction
Week 4	Nervous System ▯ Neurons and glial cells ▯ Nerve impulses and action potentials ▯ Synaptic transmission and neurotransmitters ▯ Central and peripheral nervous systems
Week 5	Endocrine System ▯ Endocrine glands and their functions ▯ Hormones and their chemical properties ▯ Hypothalamus-pituitary axis and its regulation of endocrine function
Week 6	Cardiovascular System ▯ Structure and function of the heart ▯ Blood vessels and circulation ▯ Cardiac cycle and heart sounds ▯ Regulation of heart rate and blood pressure
Week 7	Respiratory System ▯ Upper and lower respiratory tracts ▯ Mechanics of breathing ▯ Pulmonary circulation and gas exchange ▯ Control of respiration
Week 8	Digestive System ▯ Organs of the digestive system and their functions ▯ Tissue layers of the digestive system ▯ Digestive processes and regulation
Week 9	Urinary System ▯ Kidneys and nephrons ▯ Urine formation and transport ▯ Micturition reflex and neural control of urination
Week 10	Reproductive System ▯ Male and female reproductive systems ▯ Gametogenesis and hormonal regulation

	▯ Menstrual cycle and fertilization ▯ Pregnancy and embryonic development
Week 11	Integumentary System ▯ Skin layers and appendages ▯ Skin functions and color ▯ Wound healing and scar formation
Week 12	Laboratory Work ▯ Dissection of anatomical models or cadavers ▯ Identification of anatomical structures
Week 13	Laboratory Work ▯ Observation of physiological processes ▯ Data collection and analysis
Week 14	Review
Week 15	Final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Textbook: "Human Anatomy" by Frederic H. Martini, Michael J.Timmons, and Robert B. Tallitsch	Yes
Recommended Texts		
Websites	Online resources: Khan Academy, YouTube, and other educational websites	

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	**A** - Excellent	امتياز	90 - 100	Outstanding Performance
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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 DESCRIPTION FORM

Module Information					
Module Title	**Physiology**			**Module Delivery**	
Module Type	**core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**IMS111**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	IMS		**College**	CSIS	
Module Leader	Assist. Prof Dr. Sundus Waleed Khalid		**e-mail**	Sundus.khalid@uobasrah.edu.iq	
Module Leader's Acad. Title	Assistant Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**Version Number**	**1.0**	

Relation with other Modules			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims أ	objectives of a human physiology course include: • To provide students with an understanding of how the human body works • To introduce students to the function, regulation, and integration of human body organ systems • To build on knowledge of basic physiological principles and provide a course of study in mammalian, principally human, systems physiology. • To prepare students for health sciences programs, including medicine, physician assistant, nursing, chiropractic, and other medical-related fields. • To identify different human system. • To demonstrate blood percentage and blood pressure . • To know how to count precise number of white and red blood cells in human .
Module Learning Outcomes	• Robust understanding of human anatomy and human physiology. • Enhanced knowledge and appreciation of mammalian physiology. • Understanding of the functions of important physiological systems. • The ability to apply physiological concepts to real-life situations. • Development of critical thinking and problem-solving skills. Development of communication skills, including the ability to communicate scientific concepts effectively. • To do different laboratory analysis in human an blood
Indicative Contents	Indicative content includes the following: • Overview of Human Physiology: Importance of Human Physiology, Key Concepts in Human Physiology, Approaches to Studying Human Physiology, Interdisciplinary Nature of Human Physiology. • Training the student to use different apparatus in the laboratory and develop research capacities to the students.

Learning and Teaching Strategies	
Strategies	1. Provide a foundation of physiological principles. 2. Use active learning strategies: Active learning strategies have been shown to increase both academic performance and student engagement. 3. Use assessment activities: Assessment activities in the physiology undergraduate program must take class size into consideration. 4. The course should cover the physiology of the entire human body thoroughly.

	The course should provide practical applications of physiological principles to real-life situations. 5-Explanation and Discussion of the Lectures 6. boosting the student to make reports, and power point presentation

Student Workload (SWL)

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #5, #9
	Assignments	1	10%(10)	Continuous	All
	Projects / Lab.				
	Report	1	10%(10)		
Summative assessment	**Midterm Exam**	2hr	20% (20)	7	LO #1 - #6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100%		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Introduction: cells and tissue.
Week 2	Cell physiology.

Week 3	Circulatory system
Week 4	Urinary system.
Week 5	exam
Week 6	Respiratory system.
Week 7	Endocrine system.
Week 8	Hematology (anemia types)
Week 9	Polycythemia and jaundice
Week 10	Diabetes mellitus
Week 11	**Preparatory week before the final Exam**
Week 12	
Week 13	
Week 14	
Week 15	

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Draw blood method , source and tools used in lab.
Week 2	Measurement of red blood cell and white blood cell count
Week 3	Measurement of hemoglobin
Week 4	Packed cell volume
Week 5	Erythrocyte sedimentation rate
Week 6	Blood group
Week 7	Blood pressure
Week 8	Sickle cell anemia test
Week 9	Bleeding and clotting time

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	Human physiology ,Animal physiology , hematology - Endocrinology	yes
Recommended Texts	Animal physiology and endocrine glands , Cyton Book of physiology	yes
Websites	http://wilkibooks. www.Jairr.com www.damastagate.com	

Grading Scheme				
Group	**Grade**		**Marks (%)**	**Definition**
Success Group (50 - 100)	**A** - Excellent		90 - 100	Outstanding Performance
	B - Very Good		80 - 89	Above average with some errors
	C - Good		70 - 79	Sound work with notable errors
	D - Satisfactory		60 - 69	Fair but with major shortcomings
	E - Sufficient		50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX** – Fail		(45-49)	More work required but credit awarded
	F – Fail		(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 DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Fundamentals of Health informatics**			**Module Delivery**	
Module Type	**Basic**			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**IMS112**				
ECTS Credits	**4**				
SWL (hr/sem)	100				
Module Level		1	**Semester of Delivery**		2
Administering Department		IMS	**College**		CSIT
Module Leader	Garinrh S. Ohannesian				garineh.sarkies@uobasrah.edu.iq
Module Leader's Acad. Title		Asst. Lecturer	**Module Leader's Qualification**		MSc
Module Tutor			**e-mail**		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	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives **أهداف المادة الدراسية**	1. Define Health Informatics: Understand the scope and significance of health informatics in healthcare delivery, management, and research. 2. Explain Health Information Systems: Comprehend the types of health information systems, including electronic health records (EHRs), health information exchanges (HIEs), and telemedicine platforms. 3. Manage Health Data: Understand the principles of health data management, including data collection, storage, and data quality assurance in healthcare settings. 4. Utilize Health Data Standards and Terminologies: Familiarize themselves with health data standards, coding systems, and terminologies commonly used in healthcare to ensure interoperability and consistency. 5. Address Health Information Privacy and Security: Identify the ethical, legal, and security considerations involved in handling and safeguarding health information and patient privacy. 6. Apply Healthcare Analytics and Decision Support: Learn how health informatics can be used to analyze healthcare data, generate insights, and support clinical decision-making. 7. Explore Telemedicine and Mobile Health: Understand the role of telemedicine and mobile health technologies in delivering remote healthcare services and engaging patients. 8. Integrate Health Informatics with Public Health: Recognize the application of health informatics in public health surveillance, disease prevention, and health promotion. 9. Engage Patients using Health Informatics: Understand patient engagement strategies through health informatics tools, including patient portals and online health services. 10. Comprehend Health Informatics in Clinical Research: Appreciate the significance of health informatics in clinical research, evidence-based practice, and clinical trials. 11. Improve Healthcare Quality with Health Informatics: Recognize how health informatics can enhance healthcare quality, patient safety, and outcomes. 12. Explore Emerging Trends in Health Informatics: Stay updated on the latest technological advancements, such as artificial intelligence (AI) and blockchain, and their potential impact on healthcare. 13. Address Ethical and Social Implications: Understand the ethical considerations and social implications related to health informatics practices, including equity, access, and social justice issues.
Module Learning Outcomes **مخرجات التعلم للمادة الدراسية**	1. Understand Health Informatics Concepts: Demonstrate a clear understanding of the fundamental concepts, principles, and terminologies in health informatics. 2. Apply Health Information Systems: Utilize knowledge of health information systems to manage patient data, facilitate information exchange, and improve healthcare workflow. 3. Analyze Health Data: Effectively analyze and interpret health data using appropriate statistical and analytical methods. 4. Implement Health Data Standards: Apply health data standards and

	terminologies to ensure accurate, consistent, and interoperable health data exchange. 5. Address Privacy and Security Concerns: Recognize and address ethical, legal, and security issues related to health information privacy and data security. 6. Employ Healthcare Analytics: Utilize healthcare analytics tools and techniques to extract meaningful insights from health data for informed decision-making. 7. Utilize Telemedicine and Mobile Health: Understand the applications of telemedicine and mobile health technologies to deliver remote healthcare services and enhance patient engagement. 8. Integrate Health Informatics with Public Health: Apply health informatics to support public health initiatives, surveillance, and disease prevention efforts. 9. Enhance Patient Engagement: Implement strategies for engaging patients through health informatics tools, fostering a patient-centered approach to healthcare. 10. Explore Health Informatics in Clinical Research: Evaluate the role of health informatics in clinical research, evidence-based practice, and clinical decision-making. 11. Improve Healthcare Quality: Identify opportunities to leverage health informatics to improve healthcare quality, patient safety, and outcomes. 12. Embrace Emerging Trends: Stay informed about emerging trends and technologies in health informatics, such as AI, blockchain, and virtual reality, and assess their potential impact on healthcare. 13. Address Ethical and Social Implications: Analyze the ethical considerations and social implications of health informatics practices and contribute to equitable and accessible healthcare solutions. 14. Apply Python Programming in Health Informatics: Demonstrate practical skills in using Python programming language to manipulate health data, analyze healthcare datasets, and develop health informatics applications.
Indicative Contents **المحتويات الإرشادية**	Introduction to Health Informatics • Overview of health informatics and its significance in modern healthcare • Historical evolution and key milestones in health informatics • Health informatics roles and careers Health Information Systems • Types of health information systems (HIS) • Electronic health records (EHRs) and their functionalities • Health information exchange (HIE) and interoperability Health Data Management • Principles of health data management • Health data sources, collection, and storage • Data quality and data governance in healthcare Health Data Standards and Terminologies • Importance of health data standards • Common healthcare terminologies and coding systems (e.g., SNOMED-CT, ICD, CPT) • Introduction to HL7 and DICOM standards Health Information Privacy and Security • HIPAA regulations and their impact on health information privacy • Security challenges in health informatics • Data breaches and cybersecurity in healthcare Healthcare Analytics and Decision Support

	• Introduction to healthcare analytics and its applications • Clinical decision support systems (CDSS) and their role in improving patient outcomes • Data visualization for healthcare Telemedicine and Mobile Health • Telemedicine concepts and technologies • Remote patient monitoring and wearable devices • Telehealth legal and ethical considerations Health Informatics and Public Health • Use of health informatics in public health surveillance and reporting • Population health management and disease prevention • Health information exchange for public health agencies Health Informatics for Patient Engagement • Patient portals and online health services • Patient engagement strategies using health informatics • Designing patient-centered health technologies Health Informatics and Clinical Research • Role of health informatics in clinical research and evidence-based practice • Use of big data and data analytics in clinical trials • Ethical considerations in health informatics research Health Informatics and Quality Improvement • Quality management and performance measurement in healthcare • Using health informatics to enhance healthcare quality • Health informatics in the context of value-based care Emerging Trends in Health Informatics • Artificial intelligence (AI) and machine learning in health informatics • Blockchain applications in healthcare • Virtual and augmented reality in medical education and patient care Ethical and Social Implications of Health Informatics • Ethical considerations in health informatics practices • Equity, access, and social justice issues in health informatics • Future directions and challenges in health informatics

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
	1. Lectures and Presentations: Provide comprehensive lectures and presentations to introduce key concepts, theories, and technological elements of health informatics 2. Case Studies and Real-World Examples: Use case studies and real-world examples to illustrate the application of health informatics principles in healthcare settings. This helps students understand how health information systems are designed and used 3. Hands-on Activities and Projects: Engage students in hands-on activities and projects that allow them to apply their knowledge and skills in practical scenarios. This could include designing a mock electronic health record system or analyzing health data 4. Group Discussions and Debates: Encourage group discussions and debates to foster critical thinking and collaboration among students. This can be done by

	assigning topics related to health informatics for students to research and present their findings 5. Guest Speakers and Industry Experts: Invite guest speakers and industry experts to share their experiences and insights in the field of health informatics. This provides students with a broader perspective and exposes them to real-world challenges and opportunities 6. Online Resources and Learning Platforms: Utilize online resources and learning platforms to supplement classroom instruction. This could include online modules, videos, interactive quizzes, and discussion forums 7. Assessment Methods: Use a variety of assessment methods such as quizzes, exams, projects, and presentations to evaluate students' understanding and application of health informatics concepts 8. Continuous Feedback and Support: Provide continuous feedback and support to students throughout the module. This can be done through regular office hours, online communication channels, and timely grading of assignments

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	49	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	51	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #2-#8
	Assignments				
	Projects / Lab	1	10% (10)	Continuous	LO #1- #8 and #10
	Report	1	10% (10)	13	LO #1- #8 and #10
Summative assessment	**Midterm Exam**	2hr	20% (20)	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 Health Informatics
Week 2	Health Information Systems
Week 3	Health Data Management
Week 4	Health Data Standards and Terminologies
Week 5	Health Information Privacy and Security
Week 6	Midterm examination
Week 7	Healthcare Analytics and Decision Support
Week 8	Telemedicine and Mobile Health
Week 9	Health Informatics and Public Health
Week 10	Health Informatics for Patient Engagement
Week 11	Health Informatics and Clinical Research
Week 12	Health Informatics and Quality Improvement
Week 13	Emerging Trends in Health Informatics
Week 14	Ethical and Social Implications of Health Informatics
Week 15	**Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to Python and Healthcare Data • Setting up Python environment and IDEs • Basic Python syntax and data structures • Reading and writing healthcare data (e.g., CSV, JSON)
Week 2	Data Manipulation and Cleaning • Data preprocessing techniques for health datasets • Handling missing data and data imputation • Data transformation and feature engineering
Week 3	Exploratory Data Analysis in Healthcare • Descriptive statistics and data visualization for healthcare data • Identifying trends and patterns in health datasets

	• Plotting health-related graphs (e.g., histograms, box plots)
Week 4	Introduction to Pandas for Healthcare Data • Understanding Pandas data frames and series • Data filtering, sorting, and grouping in health datasets • Combining and merging healthcare data
Week 5	Healthcare Data Visualization with Matplotlib and Seaborn • Creating visualizations for health informatics datasets • Customizing plots and charts for healthcare data • Presenting health-related insights through visualizations
Week 6	Midterm exam
Week 7	Introduction to Numpy for Health Data Analysis • Numerical computing with Numpy in Python • Basic mathematical operations on health data arrays • Applying Numpy for statistical analysis
Week 8	Health Data Analysis with Scipy • Introduction to Scipy libraries for scientific computing • Performing statistical tests on healthcare data • Applying Scipy for health research studies
Week 9	Introduction to Machine Learning in Health Informatics • Basics of supervised and unsupervised machine learning • Preparing health data for machine learning tasks • Implementing simple machine learning algorithms using Scikit-learn
Week 10	Machine Learning for Healthcare Predictive Analytics • Training and evaluating healthcare prediction models • Model evaluation metrics for health informatics applications • Handling imbalanced health datasets in machine learning
Week 11	ext Mining in Health Informatics • Processing healthcare text data using Python • Natural Language Processing (NLP) for clinical notes • Building simple text classifiers for health-related text
Week 12	Healthcare Data Visualization with Plotly • Interactive and dynamic data visualizations for healthcare • Building interactive healthcare dashboards • Presenting health insights through web-based visualizations
Week 13	Health Informatics Project Development

	• Students work on a health informatics project using Python • Implementing a real-world health informatics application • Presenting and demonstrating their projects to the class
Week 14	Final Project Presentations and Wrap-Up • Students present their final projects to the class • Review of key concepts and takeaways from the lab • Discussion of potential future applications of Python in health informatics
Week 15	Final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	**Fundamentals of Health Information Management** by Melanie S. Brodnik, Mary A. Johnson, and Karyn P. Lee	Yes
Recommended Texts	**Guide to Health Informatics** by Enrico Coiera. **Health Informatics: An Interprofessional Approach** by Ramona Nelson and Nancy Staggers. **Health Informatics: Practical Guide for Healthcare and Information Technology Professionals** by Robert E. Hoyt and Ann K. Yoshihashi	Yes
Websites		

Grading Scheme
مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (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 (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.