

**Ministry of Higher Education and Scientific Research
Scientific Supervision and Scientific Evaluation Apparatus
Directorate of Quality Assurance and Academic Accreditation
Accreditation Department**



Academic Program and Course Description Guide

2026

Introduction:

The educational program is a well-planned set of courses that include procedures and experiences arranged in the form of an academic syllabus. Its main goal is to improve and build graduates' skills so they are ready for the job market. The program is reviewed and evaluated every year through internal or external audit procedures and programs like the External Examiner Program.

The academic program description is a short summary of the main features of the program and its courses. It shows what skills students are working to develop based on the program's goals. This description is very important because it is the main part of getting the program accredited, and it is written by the teaching staff together under the supervision of scientific committees in the scientific departments.

This guide, in its second version, includes a description of the academic program after updating the subjects and paragraphs of the previous guide in light of the updates and developments of the educational system in Iraq, which included the description of the academic program in its traditional form (annual, quarterly), as well as the adoption of the academic program description circulated according to the letter of the Department of Studies T 3/2906 on 3/5/2023 regarding the programs that adopt the Bologna Process as the basis for their work.

In this regard, we can only emphasize the importance of writing an academic programs and course description to ensure the proper functioning of the educational process.

Concepts and terminology:

Academic Program Description: The academic program description provides a brief summary of its vision, mission and objectives, including an accurate description of the targeted learning outcomes according to specific learning strategies.

Course Description: Provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the students to achieve, proving whether they have made the most of the available learning opportunities. It is derived from the program description.

Program Vision: An ambitious picture for the future of the academic program to be sophisticated, inspiring, stimulating, realistic and applicable.

Program Mission: Briefly outlines the objectives and activities necessary to achieve them and defines the program's development paths and directions.

Program Objectives: They are statements that describe what the academic program intends to achieve within a specific period of time and are measurable and observable.

Curriculum Structure: All courses / subjects included in the academic program according to the approved learning system (quarterly, annual, Bologna Process) whether it is a requirement (ministry, university, college and scientific department) with the number of credit hours.

Learning Outcomes: A compatible set of knowledge, skills and values acquired by students after the successful completion of the academic program and must determine the learning outcomes of each course in a way that achieves the objectives of the program.

Teaching and learning strategies: They are the strategies used by the faculty members to develop students' teaching and learning, and they are plans that are followed to reach the learning goals. They describe all classroom and extra-curricular activities to achieve the learning outcomes of the program.

Academic Program Description Form

University Name:: University of Basrah

Faculty/Institute: College of engineering

Scientific Department: Electrical Engineering Department

Academic or Professional Program Name: Bachelor's degree (B.Sc.) – Electrical Engineering

Final Certificate Name: B.Sc. in Electrical Engineering

Academic System: Semester System

Description Preparation Date: 8/2026

File Completion Date: 9/2026

Signature:

Head of Department Name:

Prof. Dr. Amar A. Aldair

Date: 21/09/2026

Signature:

Scientific Associate Name:

Date:

21/9/2026

The file is checked by:

Department of Quality Assurance and University Performance

Director of the Quality Assurance and University Performance Department:

Date: 21/9/2026

Dr. Ali K. Maryook

Signature:



1. Program Vision

Department of Electrical Engineering looks forward to preparing specialized engineers in various fields of electrical engineering that are armed with a sober scientific, intellectual engineering aspect, and enhanced by practical aspects by linking theoretical curricula with the requirements of the local and regional market . The department also aspires to keep pace with the progress and continuous development in the disciplines of electrical engineering sciences. The department also seeks to localize advanced technology in the industrial sector and harness the outputs of scientific research for it in a way that is compatible with the transition to clean energy and achieve economics of costs and resources. All of this is reflected to achieve the vision of the College of Engineering in the integration of the various engineering disciplines.

2. Program Mission

The electrical engineering department was established in 1964 as the second academic department for the establishment of the College of Engineering at the University of Basrah. It was necessary to establish a department for meeting the emerging need for skilled electrical engineers and to keep abreast of the scientific and technical progress in the world. Since its inauguration, the electrical engineering department adopted a well academic program equal to the electrical engineering departments worldwide by focusing on both theoretical and practical integrated aspects of the electrical engineering fields of study. The undergraduate study at the department is four years in length; from the moment of receiving the freshman year students whose average grades qualify them to join it up till the

graduation of the senior year students where they get their Bachelor of Science degree in electrical engineering.

3. Program Objectives

The curriculum requirements specify subject areas appropriate to Electrical Engineering (EE). The professional component must include:

- 1) A combination of mathematics and basic sciences general education component (some with experimental experience) appropriate to the discipline.
- 2) Electrical Engineering topics, consisting of electrical engineering sciences and engineering design appropriate to the electrical utilization study.
- 3) A general education component that complements the technical content of the curriculum and is consistent with the program and institution objectives..

4. Program Accreditation

5. Other external influences

6. Program Structure

Program Structure	Number of Courses	Credit hours	Percentage	Reviews*
Institution Requirements	7	13	9%	
College Requirements	12	29	22%	
Department Requirements	36	135	69%	
Summer Training				

Other

* This can include notes whether the course is basic or optional.

7. Program Description

		Republic of Iraq - Ministry of Higher Education and Scientific Research University of Basrah Bachelor's degree in Electrical Engineering (First cycle) Four years (Eight semesters) - 240 ECTS credits - 1 ECTS = 25 hr Program Curriculum (2023 - 2024)					جمهورية العراق - وزارة التعليم العالي والبحث العلمي جامعة البصرة بكالوريوس في الهندسة الكهربائية (الدورة الأولى) أربع سنوات (ثمانية فصول دراسية) - ٢٤٠ وحدة ائتمانية - كل وحدة ائتمانية = ٢٥ ساعة المنهاج الدراسي للعام ٢٠٢٣-٢٠٢٤											
Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)					Exam hr/sem	SSWL hr/sem	USSL hr/sem	SWL hr/sem	ECTS	Module Type	
UGI	One	1	UOB101	English Language	اللغة الإنكليزية	English	2						3	33	17	50	2.00	B
		2	UOB103	Computer Programming-I	برمجة الحاسوب-١	English	2		2				3	63	12	75	3.00	B
		3	E101	Engineering Drawing	الرسم الهندسي	English				3			3	48	52	100	4.00	B
		4	E102	Mathematics-I	الرياضيات-١	English	3				1		3	63	112	175	7.00	B
		5	EE101	Basic of Electrical Engineering-I	أسس الهندسة الكهربائية-١	English	3		3		1		3	108	117	225	9.00	C
		6	E104	Mechanical Engineering	الميكانيك الهندسي	English	2				1		3	48	77	125	5.00	B
						Total	12	0	5	3	3	0	18	363	387	750	30.00	
UGI	Two	1	UOB102	Human Rights and Democracy	الحرية وحقوق الانسان	Arabic	2						3	33	17	50	2.00	B
		2	E106	Computer Programming-II	برمجة الحاسوب-2	English	2		2				3	63	12	75	3.00	B
		3	EE103	Digital Logic	المنطق الرقمي	English	2		2				3	63	37	100	4.00	C
		4	E103	Mathematics-II	الرياضيات-٢	English	3				1		3	63	112	175	7.00	B
		5	EE102	Basic of Electrical Engineering-II	أسس الهندسة الكهربائية-٢	English	3		3		1		3	108	117	225	9.00	C
		6	E105	Physics	الفيزياء	English	2				1		3	48	77	125	5.00	B
						Total	14	0	7	0	3	0	18	378	372	750	30.00	
UGII	Three	1	E201	Comprehensive Vector and Multivariable Calculus	المتجهات الشاملة وحساب التفاضل والتكامل المتعدد	English	3					1	3	80	70	150	6.00	B
		2	EE201	Electronic Circuits	الدوائر الإلكترونية	English	4					1	3	125	100	225	9.00	C
		3	EE202	Electrical Circuits Analysis	تحليل الدوائر الكهربائية	English	3		3			1	3	78	47	125	5.00	C
		4	EE203	Microprocessors and Microcontrollers	المعالجات والمتحكمات الدقيقة	English	2		2			1	3	78	47	125	5.00	C
		5	EE204	DC Machines	مكائن التيار المستمر	English	3		3			1	3	78	47	125	5.00	C
						Total	45	0	22	0	5	0	48	439	311	750	30.00	
	UGII	Four	1	E202	Mathematical Analysis and Transformations	تقنيات التحليل والتحويل الرياضي	English	3					1	3	80	45	125	5.00
2			EE205	Introduction to Electrical Network	مقدمة في الشبكات الكهربائية	English	3		3			1	3	108	67	175	7.00	C
3			EE206	Electromagnetic Fields	المجالات الكهرومغناطيسية	English	4					1	3	125	50	175	7.00	C
4			EE207	Electrical Transformers	المحولات الكهربائية	English	2		3			1	3	80	45	125	5.00	C
5			UOB105	Baath Party crimes	جرائم حزب البعث البائد	Arabic	2						3	33	17	50	2.00	B
6			UOB106	English Language II	اللغة الإنكليزية II	English	2						3	33	17	50	2.00	B
7			UOB107	Arabic Language	اللغة العربية	Arabic	2						3	33	17	50	2.00	B
					Total	18	0	6	0	4	0	21	492	258	750	30.00		

3 rd Year / Course-1			
No.	Module Name in English	Module Name in Arabic	Units
1	Engineering Analysis	التحليلات الهندسية	3
2	Induction Machines	المكائن الحثية	2
3	Linear Systems Theory	نظرية النظم الخطية	3
4	Communication Theory	نظرية الاتصالات	3
5	Power Systems	أنظمة القدرة	3
6	Electromagnetic Fields	المجالات	3

		الكهرومغناطيسية	
7	Laboratory 5	مختبرات 5	2
Total units			19
3rd Year / Course-2			
No.	Module Name in English	Module Name in Arabic	Units
1	Engineering Numerical Methods	الطرق العددية التطبيقية	3
2	Synchronous Machines	المكائن التزامنية	2
3	Linear Control Systems	منظومات التحكم الخطية	3
4	Digital Signals and Noise	الإشارات الرقمية والضوضاء	3
5	Analog and Digital Electronics	الإلكترونيات التناظرية والرقمية	3
6	Digital Signal Processing	معالجة الإشارات الرقمية	3
7	Laboratory 6	مختبرات 6	2
Total units			19

8. Expected learning outcomes of the program

Knowledge	
Learning Outcomes 1	LO1: Demonstrate understanding of fundamental concepts in mathematics, science, and engineering necessary to analyze and solve complex engineering problems.
Skills	
Learning Outcomes 2	LO2: Apply modern engineering tools, techniques, and methodologies to design, analyze, and optimize engineering systems
Learning Outcomes 3	LO3: Communicate effectively in oral, written, and graphical forms to present engineering ideas and technical solutions clearly and accurately.
Ethics	
Learning Outcomes 4	LO4: Recognize and evaluate the social, environmental, and ethical implications of engineering solutions, considering sustainability and safety.
Learning Outcomes 5	LO5: Demonstrate the ability to work collaboratively and responsibly in multidisciplinary teams, respecting diverse perspectives and professional responsibilities.

9. Teaching and Learning Strategies

- Lectures and multimedia-supported theoretical instruction.
- Laboratory experiments and practical sessions.
- Problem-based learning (PBL) for real-world applications.
- Project-based learning and design assignments.
- Seminars, workshops, and interactive tutorials.
- Industrial training and field/site visits.
- Self-learning using e-learning platforms and digital resources.
- Final year capstone project integrating knowledge, skills, and ethics.

10. Evaluation methods

Written examinations (midterm and final).

Quizzes and short tests.

Laboratory reports and practical assessments.

Homework assignments and problem-solving exercises.

Oral presentations and seminars.

Project reports and design evaluations.

Participation in discussions, tutorials, and workshops.

Industrial training and fieldwork evaluation.

Final year capstone project assessment (report, presentation, and viva).

11. Faculty

Faculty Members

Academic Rank	Specialization	Special Requirements/Skills (if applicable)	Number of the teaching staff

	General	Special			Staff	Lecturer
Professor	Electrical Engineering				10	–
Assistant Professor	Electrical Engineering				13	–
Lecturer	Electrical Engineering				10	10
Assistant Lecturer	Electrical Engineering				16	–

Professional Development

Mentoring new faculty members

Mentoring New Faculty Members

At the University of Basrah, College of Engineering, Electrical Engineering Department, a structured process is followed to mentor new, visiting, full-time, and part-time faculty members. The process includes:

- **Orientation Programs:** New faculty members are introduced to the university regulations, academic policies, and departmental procedures.
- **Assigned Mentors:** Each new faculty member is paired with an experienced senior staff member who provides guidance on teaching methods, course planning, student assessment, and research activities.
- **Workshops and Training Sessions:** Regular professional development workshops are offered to enhance pedagogical skills, research capacity, and the use of modern engineering tools.
- **Peer Observation and Feedback:** Junior faculty are encouraged to attend classes of senior staff and receive constructive feedback on their own teaching performance.
- **Collaborative Activities:** New faculty are integrated into departmental committees, research groups, and student advising to strengthen teamwork and academic engagement.
- **Continuous Support:** Both full-time and part-time faculty receive ongoing support through departmental meetings, open discussions, and access to teaching resources.

This structured mentoring process ensures that new faculty members are effectively integrated into the academic environment and are able to contribute to the department's teaching, research, and community service missions.

Professional development of faculty members

The Electrical Engineering Department at the University of Basrah supports the professional and academic development of its faculty through a combination of teaching strategies, assessment methods, and ongoing training. Faculty members use lectures, seminars, laboratory sessions, project-based learning, and collaborative activities to enhance student learning. Student outcomes are assessed through exams, course evaluations, surveys, and regular program reviews to ensure educational objectives are met. The department also encourages faculty participation in workshops, conferences, and collaborations with industry and other institutions to improve teaching skills, stay updated on technological advancements, and engage in research, fostering continuous professional growth.

12. Acceptance Criterion

The Electrical Engineering Department at the University of Basrah follows the centralized admission system established by the Ministry of Higher Education and Scientific Research in Iraq. For the 2024 academic year, prospective students must meet the following criteria:

- **Educational Background:** Completion of secondary education with a focus on scientific subjects, particularly those relevant to engineering disciplines.
- **Minimum Grade Point Average (GPA):** Achieving a GPA that meets or exceeds the threshold set by the Ministry for the 2024 academic year.
- **Age Limit:** Applicants should be born in 1997 or later.
- **Graduation Status:** Only students who have graduated in the current academic year are eligible to apply.

These regulations are part of the centralized admission system designed to standardize and streamline the enrollment process across public universities in Iraq. Prospective students are encouraged to consult the official announcements from the Ministry of Higher Education and Scientific Research for the most current and detailed information regarding admission criteria.

13. The most important sources of information about the program

The primary sources of information about the Electrical Engineering program at the University of Basrah include:

1. **Official Department Website:** The Electrical Engineering Department's page provides comprehensive details about the department's history, faculty, research areas, and contact information.
2. **Academic Program Information:** The Academic Program page outlines the curriculum, program learning outcomes, and course specifications, offering insights into the educational structure and objectives.
3. **University of Basrah Official Website:** The University's main site serves as a central hub for announcements, regulations, and broader institutional information relevant to prospective and current students.
4. **Ministry of Higher Education and Scientific Research:** The Ministry's website is the authoritative source for national admission policies, accreditation standards, and updates on higher education regulations in Iraq.

These resources collectively offer detailed and up-to-date information about the Electrical Engineering program at the University of Basrah.

14. Program Development Plan

List all courses in the program by term starting with the first term of the first year and ending with the last term of the final year			Indicate Whether Course is Required, Elective or Selected Elective by R, E or SE ¹	Subject Area			Last Two Terms the Course was Offered: Year and Semester	Maximum Section Enrollment for the Last Two Terms the Course was Offered ²
				Math & Basic	Engineering Topics. Check (✓) if Contain	Other		
Course								
Dept.	Code	Title						

Electrical	UOB101	English Language	Required			2	FS (2024-2025)	250
Electrical	UOB103	Computer Programming-I	Required			3	FS (2024-2025)	250
Electrical	E101	Engineering Drawing	Required			4	FS (2024-2025)	250
Electrical	E102	Mathematics-I	Required	7			FS (2024-2025)	250
Electrical	EE101	Basic of Electrical Engineering- I	Required		9		FS (2024-2025)	250
Electrical	E104	Mechanical Engineering	Required			5	FS (2024-2025)	250
Electrical	UOB102	Human Rights and Democracy	Required			2	SS (2024-2025)	250
Electrical	E106	Computer Programming-II	Required			2	SS (2024-2025)	250
Electrical	EE103	Digital Logic	Required		4		SS (2024-2025)	250
Electrical	E103	Mathematics-II	Required	7			SS (2024-2025)	250
Electrical	EE102	Basic of Electrical Engineering-II	Required		9		SS (2024-2025)	250
Electrical	E105	Applied Sciences	Required	5			SS (2024-2025)	250
Electrical	E201	Comprehensive Vector and	Required	6			FS (2024-2025)	700
Electrical	EE201	Electronic Circuits	Required		9		FS (2024-2025)	700
Electrical	EE202	Electrical Circuits Analysis	Required		5		FS (2024-2025)	700
Electrical	EE203	Microprocessors and	Required		5		FS (2024-2025)	700
Electrical	EE204	DC Machines	Required		5		FS (2024-2025)	700
Electrical	E202	Mathematical Analysis and	Required	5			FS (2024-2025)	700
Electrical	EE205	Introduction to Electrical Networks	Required		9		SS (2024-2025)	700
Electrical	EE206	Electromagnetic Fields	Required		7		SS (2024-2025)	700
Electrical	EE207	Electrical Transformers	Required		5		SS (2024-2025)	700
Electrical	UOB105	Baath Party crimes	Required			2	SS (2024-2025)	700
Electrical	UOB106	English Language II	Required			2	SS (2024-2025)	700
Electrical	UOB107	Arabic Language	Required			2	SS (2024-2025)	700
Electrical	EE301	Engineering Analysis	Required	3			FS (2024-2025)	343
Electrical	EE302	Induction Machines	Required		2		FS (2024-2025)	343

Electrical	EE303	Linear Systems Theory	Required		3		FS (2024-2025)	343
Electrical	EE304	Communication Theory	Required		3		FS (2024-2025)	343
Electrical	EE305	Power Systems	Required		3		FS (2024-2025)	343
Electrical	EE313	Laboratory 5	Required		2		FS (2024-2025)	343
Electrical	EE306	Engineering Numerical Methods	Required	3			SS (2024-2025)	343
Electrical	EE307	Synchronous Machines	Required		2		SS (2024-2025)	343
Electrical	EE308	Linear Control Systems	Required		3		SS (2024-2025)	343
Electrical	EE309	Digital Signals and Noise	Required		3		SS (2024-2025)	343
Electrical	EE310	Analog and Digital Electronics	Required		3		SS (2024-2025)	343
Electrical	EE311	Digital Signal Processing	Required		3		SS (2024-2025)	343
Electrical	EE314	Laboratory 6	Required		2		SS (2024-2025)	343
Add rows as needed to show all courses in the curriculum								
Overall credit hours for completion of the program				36	135	28		
Totals must satisfy minimum semester credit hours				30				

Program Skills Outline															
				Required program Learning outcomes											
Year/Level	Course Code	Course Name	Basic or optional	Knowledge				Skills				Ethics			
				A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	C4
first	UOB101	English Language	Basic							*	*				
	UOB103	Computer Programming-I	Basic	*	*			*	*						
	E101	Engineering Drawing	Basic	*	*	*	*	*	*	*	*				
	E102	Mathematics -I	Basic	*	*	*	*								
	EE101	Basic of Electrical Engineering-I	Basic	*	*	*	*								
	E104	Mechanical Engineering	Basic	*	*	*	*								
	UOB102	Human Rights and Democracy	Basic									*	*	*	*

	E106	Computer Programming-II	Basic	*	*			*	*						
	EE103	Digital Logic	Basic	*	*	*	*								
	E103	Mathematics -II	Basic	*	*	*	*								
	EE102	Basic of Electrical Engineering-II	Basic	*	*	*	*								
	E105	Applied Sciences	Basic	*	*	*	*								
second	E201	Comprehensive Vector and Multivariable Calculus	Basic	*	*	*	*								
	EE201	Electronic Circuits	Basic	*	*	*	*								
	EE202	Electrical Circuits Analysis	Basic	*	*	*	*								
	EE203	Microprocessors and Microcontrollers	Basic	*	*	*	*	*	*						

	EE204	DC Machines	Basic	*	*	*	*								
	E202	Mathematical Analysis and Transform Techniques	Basic	*	*	*	*								
	EE205	Introduction to Electrical Networks	Basic	*	*	*	*								
	EE206	Electromagnetic Fields	Basic	*	*	*	*								
	EE207	Electrical Transformers	Basic	*	*	*	*								
	UOB105	Baath Party crimes	Basic									*	*	*	*
	UOB106	English Language II	Basic							*	*				
	UOB107	Arabic Language	Basic							*	*				
Third	EE301	Engineering Analysis	Basic	*	*	*	*								
	EE302	Induction Machines	Basic	*	*	*	*								
	EE303	Linear Systems Theory	Basic	*	*	*	*								
	EE304	Communication Theory	Basic	*	*	*	*								

	EE305	Power Systems	Basic	*	*	*	*								
	EE313	Laboratory 5	Basic					*	*						
	EE306	Engineering Numerical Methods	Basic	*	*	*	*								
	EE307	Synchronous Machines	Basic	*	*	*	*								
	EE308	Linear Control Systems	Basic	*	*	*	*								
	EE309	Digital Signals and Noise	Basic	*	*	*	*								
	EE310	Analog and Digital Electronics	Basic	*	*	*	*								
	EE311	Digital Signal Processing	Basic	*	*	*	*								
	EE314	Laboratory 6	Basic	*	*	*	*	*	*						

- Please tick the
- boxes corresponding to the individual program learning outcomes under evaluation.

Course Description Form

1. Course Name:	
English Language	
2. Course Code:	
UOB101	
3. Semester / Year:	
1/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 2	
SWL (hr/sem) 50	
7. Course administrator's name (mention all, if more than one name)	
Name: Lecturer Ali A. Numan	
Email:	
8. Course Objectives	
Course Objectives	This course is designed to enable the students to achieve academic oral and written communication to the standard required at university level. The course integrates all the language skills with emphasis on writing, and it stimulates students' imagination, and ,promotes personal expression. Students, in this course are trained to apply critical thinking skills to a wide range of challenging subjects from diverse academic disciplines. Course activities include writing various types of academic essays, acquiring advanced academic vocabulary, and getting involved in group discussions and debates. In addition, the course also includes other skills to consolidate the main skills, such as further .readings and use of the Blackboard Suite
9. Teaching and Learning Strategies	
Strategy	.

10. Course Structure

We ek	Ho urs	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Course introduction, syllabus review Information Theory Basics	Theoretical	
2			Reading:The Engineering Profession		
3			Discussion and Solving Exercises		
4			Reading:The Electric Current		
5			Solving Exercises and Skimming Reading		
6			Reading: The Effects of an Electric Current		
7			Scanning and extracting key information form electrical engineering- related article		
8			Reading:Electric Circuits (Part 1)		
9			Reading:Electric Circuits (Part 2)		
10			Scanning and extracting key information form electrical-related article		
11			Solving Exercises and Skimming Reading		
12			Reading:Conductors, Insulators, Semiconductors		

13			Discussion and Solving Exercises		
14			Summarizing essential information from electrical engineering related materials		
15					
16			Final Project		
			Preparatory week before the final Exam		

11. Course Evaluation

5			Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
	Formative assessment	Quizzes	3	10% (10)	6,8, 10	LO #1, 2, 5 and 9
		Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
		Projects / Lab.	2	10% (10)	6,8	All
		Report	1	10% (10)	14	LO # 5, 8 and 10
	Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
		Final Exam	2hr	50% (50)	16	All
	Total assessment			100% (100 Marks)		

12. Learning and Teaching Resources

	Text
Required Texts	Electricity and Electronics by Marija Krznaric
Recommended Texts	Electricity and Electronics by Marija Krznaric
Websites	

Course Description Form

1. Course Name:	
Mechanical Engineering	
2. Course Code:	
E104	
Semester / Year:	
1/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 5 SWL (hr/sem) 125	
Course administrator's name (mention all, if more than one name)	
Name: Lecturer Raad	
Email:	
Course Objectives	
Course Objectives	<u>Static:</u> Force system, units system, parallelogram law, force+ components, resultant of coplanar forces, components of force in space, moment of a force, moment of coupler, equilibrium, free body diagram, coplanar system, analysis of trusses, friction, nature of friction, theory of friction, coefficient of friction, centroids and center of gravity, centroids of area, centroids determined by integration, moments of inertia, parallel axes theorem, 2nd moment of area by integration, radius of gyration, moment of inertia of composite area. <u>Dynamics:</u> Kinetics of particle, rectilinear motion, curvilinear motion, rectangular components of curvilinear motion, normal and tangential component of acceleration, kinetics, force, mass and acceleration, kinetic of particle Newton's 2nd law. *Workshop Skills: The workshop training program is designed to satisfy the following: Objectives Teaching safety rules and regulations on-

	site in an industrial environment proper use of working tools, instruments, and machines, introducing basic workshop practices, production, labor, and time-requirements of workshop operations. The students are introduced to training programs in six workshops: welding, forging, turning and milling, carpentry, and casting. The student is to spend 4 hours of training in every workshop
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Teaching and Learning Strategies

Strategy

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Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Engineering Mechanics Statics	Theoretical	
2			General Principles, Machine Fundamental Concepts, Use of Measurement , The international system of units		
3			Force Vector, Scalar Vectors , Vector Operations Vectors addition of force. Addition of a System Coplanar Forces		
4			Equilibrium of a Particle Condition for the Equilibrium of a Particle		
5			The Free-Body Diagram Coplanar Force Systems		
6					

7			Force System Resultants Moment of a Force—Scalar Formulation		
8			Equilibrium of a Rigid Body Equilibrium of a Rigid Body Two- and Three-Force Members		
9			Friction, Problems Involving Dry Friction		
10			Center of Gravity and Centroid, Center of Gravity Center of Mass, and Centroid of a Body		
11			Engineering Mechanics Dynamics		
12			Kinematics of Particles Rectilinear Motion Particles,		
13			Position, Velocity, and Acceleration - Determination of the Motion of a Particle - Uniform Rectilinear Motion		
14			Curvilinear Motion Particles, Position Vector Velocity, and Acceleration		
15			Rectangular Components Velocity and Acceleration		
16			Preparatory week before the final Exam		

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Course Evaluation

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

Learning and Teaching Resources

	Text
Required Texts	,Engineering Mechanics for Static and Dynamic H.C.HIBBELI Thirteen Edition
Recommended Texts	Vector Mechanics for Engineering Beer, Tenth Edition
Websites	

Course Description Form

1. Course Name:	
Computer Programming-I	
Course Code:	
UOB103	
Semester / Year:	
1/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 3	
SWL (hr/sem) 75	
Course administrator's name (mention all, if more than one name)	
Name: Lecturer Aeda K. Alberi	
Email:	
Course Objectives	
Course Objectives	Problem solving algorithms Data structures, searching and sorting algorithms V. Basic Variables Variable types Variable Names Declarations Assignment statements and expressions in V. Basic Logical expressions and operators Mathematical expressions and operators Conditional Decisions and Loops Conditional Decisions If/Then/End If statement If/Then/Else/End If statement If/Then/ElseIf/End If statement Select Case statement Switch statement 6) IIf statement 7) Choose statement Loops For-Next statement While-Wend statement

	Do Until-Loop statement Do While-Loop statement 5) Do-Loop Until statement 6) Do-Loop While statement ARRAYS Declaring Arrays Input and Output Arrays Generate Specific Array Elements Computational (mathematical) processes that take place on the matrices (arrays)
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Teaching and Learning Strategies

Strategy

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Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Problem solving algorithm	Theoretical	
2			V.Basic Variables	And Lab.	
3			Assignment statements expressions in v.basic		
4			Conditional decisions: statements		
5			Conditional decisions: statements		
6			Select case statement		
7			Nested if statements		
8			For-next statement		
9			While statement, Do until loop statement		
10			Do while-loop statement, loop until statement		
			Do-loop while statement		

11			Nested for statement		
12			Declaring arrays		
13			Input and output arrays		
14			Preparatory week before		
15			final Exam		

Course Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	10% (10)	4, 8,12,14	LO #1, 2, 8 and 10
	Assignments	2	5 % (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	20 % (20)	Continuous	All
	Report	7	5% (5)	2,4,6,8,10,12,14	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Learning and Teaching Resources

	Text
Required Texts	Text Lectures+ video lectures
Recommended Texts	Text Lectures+ video lectures
Websites	

Course Description Form

1. Course Name:	
Basics of Electrical Engineering-I	
Course Code:	
EE101	
Semester / Year:	
1/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 9	
SWL (hr/sem) 225	
Course administrator's name (mention all, if more than one name)	
Name: Assistant professor Basim T. Kadhem	
Email:	
Course Objectives	
Course Objectives	To develop problem solving skills and understanding of circuit theory through the application of techniques. To understand voltage, current and power from a given circuit. This course deals with the basic concept of electrical circuits. This is the basic subject for all electrical and electronic circuits. To understand Kirchhoff's current and voltage Laws problems. To perform mesh and Nodal analysis.
Teaching and Learning Strategies	
Strategy	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the

same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Modern Electron Theory	Theoretical And Lab.	
2			The SI system of units		
3			Resistance and resistivity		
4			Effect of temperature on resistance		
5			Kirchhoff's laws		
6			Types of DC circuits		
7			Sources of Energy		
8			Network analysis by Maxwell's circulating currents		
9			Nodal Analysis		
10			Superposition Theorem		
11			Thevenin's theorem		
12			Norton's theorem		
13			Maximum power transfer theorem		
14			Generation of AC voltage		
15			Average value and effective value of AC quantity		
			Preparatory week before final Exam		

16					
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Course Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 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	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Learning and Teaching Resources

	Text
Required Texts	Text book 1: Basics of Electrical Engineering, W. S. Gilc Milngavic, Sep. 1971
Recommended Texts	Text book 2: Basic Electrical Engineering Science, I. Mckenzie Smith and K.T. Hosie, rans. To Arabic by: Dr. Mohammad Zaki M.K. and Mothafar A., Mosel Univ., 1973. Text book 3: Electrical and Mechanical Engineering, Theraja, LTD, New Delhi, 2005
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering

Course Description Form

1. Course Name:	
Mathematics-I	
Course Code:	
E102	
Semester / Year:	
1/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 7	
SWL (hr/sem) 175	
Course administrator's name (mention all, if more than one name)	
Name: Lecturer Ali K. Marzook	
Email:	
Course Objectives	
Course Objectives	<u>Brief Review:</u> Trigonometry, Analytic Geometry, Sets, Relations, Functions (Algebraic and Trigonometric), Differentiation and Integration. <u>Transcendental Functions:</u> Inverse Trigonometric, Natural Logarithmic, Exponential and Power: i. Definitions ii. Properties iii. Graphs iv. Derivatives and Integrals. <u>Application of the Definite Integral:</u> i) Areas between curves. ii) Volumes of revolution. iii) (Length of the curve. iv) Surface Area of revolution. <u>Hyperbolic Function:</u> i) Definition, ii) Properties iii) Graphs iv) Inverse hyperbolic. v) differentiation and Integration <u>Methods of Integration I:</u> Trigonometric Substitutions, Quadratics, Partial Fractions
Teaching and Learning Strategies	
Strategy	
Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Prerequisites for calculus	Theoretical	
2			Functions (types, domain, range)		
3			Graph of functions		
4			Graph of functions		
5			The Limits		
6			The Continuity		
7			Derivatives (rules)		
8			Derivatives (examples)		
9			Implicit differentiation		
10			Applications of derivatives (analysis of functions)		
11			Applications of derivatives (related Rates of changes)		
12			Integration(indefinite integrals)		
13			Integration(definite integrals)		
14			Applications of integration (area between curves)		
15			-----		
16			Preparatory week before final Exam		

Course Evaluation

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

Learning and Teaching Resources

	Text
Required Texts	Calculus
Recommended Texts	Mathematics for engineering
Websites	

Course Description Form

1. Course Name:	
Engineering Drawings-I	
Course Code:	
E101	
Semester / Year:	
1/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 4	
SWL (hr/sem) 100	
Course administrator's name (mention all, if more than one name)	
Name: Lecturer Hanan Majeed Hameed Al Shaabani	
Email:	
Course Objectives	
Course Objectives	- Introduction - Graphic Instruments and Their Use - Lettering - Graphic Geometry - Multi View Ortho Graphic Projection in First and Third Angle Projection - Dimensions - Third View - Isometric Drawing and Sketching - Oblique Drawing - Section of Isometric Drawing Sectional View
Teaching and Learning Strategies	
Strategy	
Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			GettingStarted AutoCAD 2021 User Interface , Drawing Units and Limits	practical	
2			Basic Drawing Skills Drawings , Draw Lines , Rectangles , Draw Circles, Arcs and Polygons		
3			Shaping Curves Draw , Edit Curved Polylines , Draw Ellipses Shape Splines		
4			Editing Entities1 Can Erase, and Undo , Use Coordinate Systems , Use Fillet and Chamfer		
5			Editing Entities2 Create Selection Sets Move and Copy Work with Arrays Use Trim , Extend		
6			Editing Entities3 Lengthen and Stretch Use Offset and Mirror Edit with Grips		
7			Drawing Aids Use Grid , Snap , Employ Ortho and Polar Tracking , Use Polar Snap , Set Running Object Snaps , Apply Object Snap Tracking		
8			Dimensioning Specify Dimensions , Add Dimension Edit Dimensions		
9			Object Visibility and Appearance Change Object Properties Set the Current Layer Manage Layer Properties Control Layer Visibility Apply Linetypes		
10			Hatching and Gradients Specify Hatch Areas . Hatch with Patterns . or Gradients		
11			Organizing Objects Define Blocks Insert Blocks Edit Blocks Work with Groups		

12			Creating and Editing Text Style Text , Write Lines of Text Write and Format Paragraphs Using MTEXT , Edit Text		
13			Working with Data Import Sketch Up Models , Insert Attributed Blocks , Edit Table Styles and Create Tables		
14			Modeling in 3D Create Edit Surface Models , Create Solid Models , Create Renderings		
15			Navigating 3D Models Visual Styles , Navigate with View Cube , Use Camera Navigate with SteeringWheel		
16			Preparatory week before final Exam		

Course Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	10% (10)	3,6,9,12,14	LO #1, 2, 10 and 11
	Assignments	14	10% (10)	All	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	14	10% (10)	All	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Learning and Teaching Resources

	Text
Required Texts	AutoCAD 2022 Tutorial First Level 2D Fundamentals
Recommended Texts	AutoCAD® 2018 and AutoCAD LT 2018ss

Course Description Form

1. Course Name:	
Mathematics-II	
Course Code:	
E103	
Semester / Year:	
2/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 7	
SWL (hr/sem) 175	
Course administrator's name (mention all, if more than one name)	
Name: Lecturer Ali K. Marzook	
Email:	
Course Objectives	
Course Objectives	<u>Methods of Integration II:</u> 6 hrs Integration by parts, Further Substitutions. <u>Approximation Integral:</u> 6 hrs i) Trapezoidal ii) Simpson <u>Vector Algebra:</u> 6 hrs i) Representation of Vectors in space (I,j,k) (unit vectors ii) Scalar Product iii) Vector product. <u>4) Complex Numbers:</u> 9 hrs i) Invented number systems ii) The Argand diagram. iii) Addition, Subtraction, product, Quotient, Power and Roots. iv) Demoivers theorem. <u>5) Polar Coordinates:</u> 9 hrs i) The polar coordinate system. ii) Graphs of polar equations. iii) Plane area in polar coordinates. <u>6) Matrices and Determinants:</u> 9 hrs i) Definition ii) Properties. iii) Inverse of a matrix. iv) Solution of Equations (Cramer's rule).
Teaching and Learning Strategies	

Strategy							
Course Structure							
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method		
1			Transcendental functions (part 1)	Theoretical			
2			Transcendental functions (part 2)				
3			Hyperbolic functions				
4			Inverse trigonometric functions				
5			Method of integrations (part 1)				
6			Method of integrations (part 2)				
7			Method of integrations (part 3)				
8			Method of integrations (part 4)				
9			Matrices				
10			Determinants				
11			Solve of linear equations matrices				
12			Complex numbers (part 1)				
13			Complex numbers (part 2)				
14			Polar coordinates (part 1)				
15			Polar coordinates (part2)				
16			Preparatory week before final Exam				
Course Evaluation							
			Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome	
	Formative assessment	Quizzes	2	10% (10)	6, 12	LO #1, 2, 10 and 11	

		Assignments	6	10% (10)	2, 4, 6, 8, 10, 12	LO # 3, 4, 6 and 7
		Projects / Lab.	1	10% (10)	15	All
		Report	6	10% (10)	3, 5, 7, 9, 11, 13	LO # 5, 8 and 10
	Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
		Final Exam	2hr	50% (50)	16	All
	Total assessment			100% (100 Marks)		

Learning and Teaching Resources

	Text
Required Texts	Calculus
Recommended Texts	Mathematics for engineering
Websites	

Course Description Form

1. Course Name:	
Human Rights and Democracy	
Course Code:	
UOB102	
Semester / Year:	
2/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits	2
SWL (hr/sem)	50
Course administrator's name (mention all, if more than one name)	
Name: Lecturer Hussain	
Email:	
Course Objectives	
Course Objectives	المادة الهامة والضرورية للطلبة حيث يتم تعريفهم بمفهوم حقوق الانسان ومبادئ وقيم ما هو مستقبل هذه الحقوق في ظل التطور والتقدم التكنولوجي وتحديات العولمة وخلق للجميع والدفاع عنها حيث ان هذه الحقوق منذ ان ولد الانسان ولدت معه حقوقه. حيث ان الطالب يحتاج الى المام بثقافة الديمقراطية ومعرفة العلمية لما في ذلك من اوسيل ممارستها ، كما ان دراسة الديمقراطية دراسة علمية سيسهم في ارساء دولة
Teaching and Learning Strategies	
Strategy	القدرة على معرفة هذه الحقوق والحريات والعمل بها
Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			ماهيم عامة حول فكرة حقوق الانسان	Theoretica	
2			التطور التاريخي لفكرة الحقوق		
3			مصادر الحقوق		
4			المصادر الدولية		
5			المصادر الوطنية		
6			حق الحياة		
7			حق الخصوصية		
8			حق التظاهر		
9			حق الجنسية		
10			حرية الرأي والتعبير		
11			حرية العقيدة والدين		
12			حرية التنقل والاقامة		
13			حقوق ذوي الاحتياجات الخاصة		
14			الوسائل الدولية		
15			الوسائل الوطنية		
16			Preparatory week before the final Exam		

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Course Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	15	10% (10)	All	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	8	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	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Learning and Teaching Resources

	Text
Required Texts	ج حقوق الانسان والديمقراطية المعد من قبل وزارة التعليم العالي والبحث العلمي
Recommended Texts	قانون العقوبات العراقي
	قانون الخدمة المدنية
	قانون انضباط موظفي الدولة
	تعليمات انضباط الطلبة
	التعليمات الامتحانية
	تعليمات تنفيذ العقود
	القانون المدني العراقي

Course Description Form

1. Course Name:	
Computer Programming-II	
Course Code:	
E106	
Semester / Year:	
2/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 3	
SWL (hr/sem) 75	
Course administrator's name (mention all, if more than one name)	
Name: Lecturer Samea	
Email:	
Course Objectives	
Course Objectives	Programming in C++: Basic syntax and semantics, variables, types, expressions, assignment, mathematical functions, logical and arithmetic operations, simple I/O, functions and parameter passing, procedure programming. Control structures: Conditional and iterative control structures, loops, sequencing, selection, and iteration functions. Basic Data Structures: Primitive types, Arrays, Strings and string processing, Records, stack, and heap allocation. Structure programming: static and dynamic structure programming. Recursion: Recursive mathematical functions, Divide-and-conquer strategies, Recursive backtracking, Implementation of recursion in C++.
Teaching and Learning Strategies	
Strategy	
Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method		
1			Two dimensional arrays	Theoretical And Lab.			
2			Two dimensional arrays				
3			Two dimensional arrays				
4			Graphics in Visual Basic				
5			Review of basic instructions v.basic to prepare advanced v.basic				
6			Sub Procedure and Function Procedure				
7			Sub Procedure and Function Procedure				
8			Build in functions				
9			Sequential files				
10			Random files				
11			Ms chart				
12			Ms flex grid				
13			Tree & database control				
14			Database control				
15			Picture & image control				
16			Preparatory week before final Exam				
Course Evaluation							
			Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome	

	Formative assessment	Quizzes	4	10% (10)	4, 8,12,14	LO #1, 2, 10 and 11
		Assignments	7	10% (10)	2,4,6,8,10,12,14	LO # 3, 4, 6 and 7
		Projects / Lab.	1	10% (10)	2,4,6,8,10,12,14	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	2hr	50% (50)	16	All
	Total assessment			100% (100 Marks)		

Learning and Teaching Resources

	Text
Required Texts	Text Lectures+ video lectures

Course Description Form

1. Course Name:	
Computer Programming-II	
Course Code:	
E106	
Semester / Year:	
2/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 3	
SWL (hr/sem) 75	
Course administrator's name (mention all, if more than one name)	
Name: Lecturer Samea	
Email:	
Course Objectives	
Course Objectives	Programming in C++: Basic syntax and semantics, variables, types, expressions, assignment, mathematical functions, logical and arithmetic operations, simple I/O, functions and parameter passing, procedure programming. Control structures: Conditional and iterative control structures, loops, sequencing, selection, and iteration functions. Basic Data Structures: Primitive types, Arrays, Strings and string processing, Records, stack, and heap allocation. Structure programming: static and dynamic structure programming. Recursion: Recursive mathematical functions, Divide-and-conquer strategies, Recursive backtracking, Implementation of recursion in C++.
Teaching and Learning Strategies	
Strategy	
Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Two dimensional arrays	Theoretical and Lab.	
2			Two dimensional arrays		
3			Two dimensional arrays		
4					
5			Graphics in Visual Basic		
6			Review of basic instructions v.basic to prepare advanced v.basic		
7			Sub Procedure and Function Procedure		
8			Sub Procedure and Function Procedure		
9			Build in functions		
10			Sequential files		
11			Random files		
12			Ms chart		
13			Ms flex grid		
14			Tree & database control		
15			Database control		
16			Picture & image control		
			Preparatory week before final Exam		

Course Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
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	Formative assessment	Quizzes	4	10% (10)	4, 8,12,14	LO #1, 2, 10 and 11
		Assignments	7	10% (10)	2,4,6,8,10,12,14	LO # 3, 4, 6 and 7
		Projects / Lab.	1	10% (10)	2,4,6,8,10,12,14	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	2hr	50% (50)	16	All
	Total assessment			100% (100 Marks)		

Learning and Teaching Resources

	Text
Required Texts	Text Lectures+ video lectures

Course Description Form

1. Course Name:	
Digital Logic	
Course Code:	
EE103	
Semester / Year:	
2/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 4	
SWL (hr/sem) 100	
Course administrator's name (mention all, if more than one name)	
Name: Lecturer Giadaa J. Kadhim	
Email:	
Course Objectives	
Course Objectives	Introduction to Digital Techniques: Number Systems: General number formula: binary, octal, decimal and hexadecimal numbers 3- Numbers Base Conversion: Arithmetic operations in different number systems, complements, binary codes, DCB, Ex-3, and Gray codes, 4-Boolean Algebra: Basic definitions, basic theorem and properties, Boolean functions. 5- Canonical and Standard forms: Karnaugh Maps: Combinational Logic Analysis: Basic combinational logic circuits, implementation combinational logic, the universal property of NAND and NOR Gates, combinational logic using NAND and NOR gates, and logic circuit operation. Adders Arithmetic Operations: Subtractions, half and full adders and subtractions, binary parallel address.

	Code Conversion: Even and odd parity logic, decoders, encoders, comparators, multiplexers and demultiplexers. Sequential Logic: Sequential Logic; base of flip-flops, RS flip-flops, J-K flip-flops, T and D flip-flops, Synchronous Sequential Logic, Excitation tables of SR flip-flops, J-K flip-flops, T and D flip-flops for design. Counters and registers. Memory units.
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Teaching and Learning Strategies

Strategy

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Number Systems(introduction of Decimal System,Binary System.	Theoretical and Lab.	
2			Octal System,Hexadecimal System.		
3			Arithmetic operation.		
4			Arithmetic operation on Binary number. Arithmetic operation on Octal number.		
5			Arithmetic operation on Octal number. Arithmetic operation on Hexadecimal number.		

6			Number base conversion. Decimal to Binary conversion. Decimal to Octal conversion.		
7			Decimal to Hexadecimal conversion. Binary to Octal conversion. Negative Numbers.		
8			Complement Representation.		
9			Coding System.		
10			Boolean algebra.		
11			Simplification Theorems.		
12			Combination network Design using a truth table.		
13			Karnaugh map.		
14			Quine - McClusky method.		
15			Map-Entered Variables		
16			Preparatory week before the final Exam		

Course Evaluation

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

Learning and Teaching Resources

	Text
Required Texts	Fundamental of Logic Design
Recommended Texts	Digital Computer Fundamentals
Website	

Course Description Form

1. Course Name:	
Basics of Electrical Engineering-II	
Course Code:	
EE102	
Semester / Year:	
2/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 9	
SWL (hr/sem) 225	
Course administrator's name (mention all, if more than one name)	
Name: Assistant professor Basim T. Kadhem	
Email:	
Course Objectives	
Course Objectives	1- Analysis of single phase a.c circuits: (10 hrs) Resistance, reactance and impedance, conductance – susceptance and admittance, the phasor diagram, series – parallel – and series / parallel circuits, power calculation in a.c. circuits, power factor & power factor correction. 2- Complex number & its application to a.c circuits: (10 hrs) Equivalent impedance : series – parallel – series / parallel – delta and star connections introduction to network theorems, Kirchoff's laws : KVL – KCL, Maxwell's circulating currents (mesh analysis) nodal analysis, super position theorem, Thevenin's theorem, Norton's theorem, maximum power transfer theorem, Millman's theorem, substitution theorem, reciprocity theorem, power calculation (complex power).

	3- Resonance: (10 hrs) Series resonance : quality factor – selectivity – half power – frequency and bandwidth, parallel resonance : quality factor – selectivity – half power – frequency and bandwidth, series / parallel resonance circuits. 4. Magnetic circuit: (15 hrs) Magnetic field, direction of magnetic field, characteristics of lines of magnetic field, magnetic field due to electric, magnetic field in a coil, force in current carrying conductor across a magnetic field, right hand rule, magnitude of the force, electromagnetic induction, faraday's law, right hand rule, magnitude of induced e.m.f. in a coil, magnetic field strength, magnetic constants, reluctance, magnetic leakage and fringing, magnetic circuits: series – parallel and series / parallel, kirchoff's laws for magnetic circuit, hysteresis and factors on its loop, hysteresis loss and eddy current loss, condition for minimum volume of a permanent magnet, load line of a permanent magnet, force between two magnetic poles, magnetic pull between two iron surfaces.
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Teaching and Learning Strategies

Strategy	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Series AC circuits	Theoretical and Lab.	
2			Parallel AC circuit		
3			Network analysis		
4			Maxwell's in AC circuit		
5			Nodal Analysis		
6			Superposition Theorem		
			Thevenin's theorem		

7			Norton's theorem		
8			Maximum power transfer theorem		
9			Power factor correction		
10			Resonance		
11			Magnetic Circuit		
12			Faraday Laws, Self inductance and Mutual inductance		
13			Hysteresis loop and Eddy current loss		
14			Electrostatics and Capacitance		
15			Charging of capacitor Discharging of capacitor		
16			Preparatory week before final Exam		

Course Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 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	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Learning and Teaching Resources

	Text
Required Texts	Text book 1: Basics of Electrical Engineering, W. S. Gilchrist, Milngavic, Sep. 1971
Recommended Texts	Text book 2: Basic Electrical Engineering Science, I. Mckenzie Smith and K.T. Hosie, 1980.

	To Arabic by: Dr. Mohammad Zaki M.K. and Mothafar A., Mosel Univ., 1973. Text book 3: Electrical and Mechanical Engineering, Theraja, LTD, New Delhi, 2005
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering

Course Description Form

1. Course Name:	
Applied Science	
Course Code:	
E105	
Semester / Year:	
2/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 3	
SWL (hr/sem) 75	
Course administrator's name (mention all, if more than one name)	
Name: Assistant Lecturer Anwer Musa	
Email:	
Course Objectives	
Course Objectives	Build a Strong Foundation in Core Scientific Principles To provide students with a solid understanding of key concepts in chemistry and physics, including atomic structure, chemical reactions, forces, energy, and motion. • Develop Practical and Experimental Skills To enable students to carry out laboratory experiments safely and effectively, using appropriate scientific methods, equipment, and techniques relevant to both chemistry and physics. • Apply Scientific Knowledge to Real-World Contexts To explore how principles of chemistry and physics are applied in everyday life, technology, healthcare, and industry, fostering relevance and engagement. • Enhance Problem-Solving and Analytical Thinking To strengthen students' abilities to analyze data, interpret experimental results, and solve scientific

	problems through logical and quantitative reasoning. Encourage Interdisciplinary Understanding To promote awareness of the interconnectedness between chemistry and physics and their combined applications in applied science fields such as materials science, energy, and environmental technology. Support Scientific Communication and Collaboration To develop students' ability to communicate scientific ideas clearly, both verbally and in writing, and to collaborate effectively on scientific investigations. Prepare for Further Study or Science-Based Careers To lay the groundwork for progression to higher-level education or employment in science-related fields fostering both academic and practical competencies.
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Teaching and Learning Strategies

Strategy	To ensure students gain both theoretical understanding and practical competence, a variety of learning and teaching strategies are employed:
	1. Lectures and Interactive Presentations Deliver core scientific concepts in chemistry and physics. Use visual aids, demonstrations, and multimedia to enhance engagement and understanding. Encourage questioning and discussion to clarify complex ideas.
	2. Practical Laboratory Work Regular hands-on experiments to develop essential scientific and technical skills. Emphasize safety, accuracy, and methodical data collection. Link experiments directly to theoretical learning to reinforce understanding.

	3. Group Work and Collaborative Learning Promote teamwork through group experiments, discussions, and projects. Encourage peer support and collaborative problem-solving. Develop communication, leadership, and interpersonal skills.
	4. Problem-Based and Inquiry-Based Learning Use real-world scenarios to apply physics and chemistry concepts to solve practical problems. Foster critical thinking and independent learning.
	5. Tutorials and Workshops Small-group sessions to focus on problem-solving, calculations, and applying theory. Provide targeted support and enable deeper exploration of key topics.
	6. Digital and Online Learning Tools Use virtual simulations and online resources (e.g., PhET simulations, virtual labs, video tutorials). Support remote or blended learning environments through VLE platforms (e.g., Moodle, Google Classroom).
	7. Formative Assessment and Feedback Regular quizzes, short assignments, and lab reports to monitor progress. Provide timely feedback to identify strengths and address areas for improvement.
	8. Reflective Learning Encourage students to reflect on their learning through lab diaries, learning logs, or self-assessment exercises.

Develop metacognitive skills and promote continuous improvement.

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			The atomic structure: Atomic Number, Silicon Germanium,	Theoretical	
2			Atom Shells, Energy level Energy gap,		
3			Energy gap in semiconductors, Electric field intensity, Potential,		
4			Drift velocity & Mobility Current density,		
			Conductivity, Resistivity		
7			Semiconductors: Intrinsic semiconductor, The hole,		
8			Extrinsic Semiconductor, n-type material (Donor), P-type material Acceptors)		
9			Charge Densities in Semiconductor, for N-type material, for P-type material		
10			The Hall effect, Fermi distribution, density of states		
11			p-n Junction: Open circuit voltage, Depletion region, Diffusion, Einstein Relationship,		
12			Total current density in a p-n junction, Barrier potential voltage, p-n Junction as a diode,		
13					

14			The biasing of p-n diode forward biasing, resistance levels,		
15			D.C. or Static resistance, A.C. (Dynamic) resistance,		
16			Capacitances of the Diode Diffusion Capacitance.		
			The atomic structure: Atomic Number, Silicon, Germanium,		
			Preparatory week before final Exam		

Course Evaluation

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

Learning and Teaching Resources

	Text
Required Texts	Electronic Devices and Circuit Theory
Recommended Texts	Solid State Electronic Devices
Websites	https://nanohub.org/courses/SFUN/2020x

Course Description Form

1. Course Name:	
Arabic Language	
Course Code:	
UOB104	
Semester / Year:	
2/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits	2
SWL (hr/sem)	50
Course administrator's name (mention all, if more than one name)	
Name: Lecturer Wjdan Sadiq	
Email:	
Course Objectives	
Course Objectives	إكتساب الطالب مهارة معرفية عن المفاهيم اللغوية . صون اللسان من الوقوع في الخطأ في نطق الكلمة . تنمية قدرات الطالب التعبيرية . تعليم الطلبة على تحليل منظومة الكلام . تعليم الطلبة على التمييز بين أصول الكلمة أو الزيادة وما تؤديه في زيادة المعنى . تعليم الطلبة على أساليب وقواعد ضبط المفردات وصياغتها . تمكين الطالب على استعمال المفردات اللغوية بالموقع السليم . تقديم تدريبات لتقوية ملكة الطالب وتنمية مقدرته في الممارسة اللغوية والبلاغة المؤثرة مع الافادة من الخبرات والتدريبات . تمكين الطلبة من قراءة وتحليل النصوص الادبية وفهمها والقدرة على حفظها . تعليم الطلبة القراءة الصحيحة لآيات القرآن الكريم ومعرفة معانيه وتنمية قدرة الطلبة على الحفظ والنطق السليم
Teaching and Learning Strategies	
Strategy	1- تقديم المحاضرة بشكل منسق ووفقا للوقت المحدد . 2- إعطاء الطلبة واجبات صفية وتكليفهم بتقديمها على المنصة . 3- إعطاء نسبة من الدرجة للأنشطة المقدمة من قبل الطلبة .

Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			حو- أقسام الكلام (اسم ,فعل,حرف)	Theoretical	
2			المبتدأ وأنواعه		
3			الخبر وأنواعه		
4			كان وأخواتها		
5			ان وأخواتها		
6			المتنى والملحق به		
7			جمع المذكر السالم والملحق به		
8			جمع المؤنث السالم والملحق به		
9			الاسماء الخمسة		
10			بناء الفعل الماضي		
11			بناء الفعل الامر		
12			الفعل المضارع بناؤه وأعرابه		
13			ماء المنصوبة (المفعول به -المفعول لى-المفعول لأجله-المفعول فيه - المفعول لأجله)		
14			الشعر -نازك الملائكة		
15			الشعر - محمد مهدي الجواهري		
16			Preparatory week before final Exam		
Course Evaluation					

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 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	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Learning and Teaching Resources

	Text
Required Texts	التعبير والإنشاء والرسم الكتابي والإملاء الخطي / أ.د. عبد الرحمن مطلق الجبوري
Recommended Texts	النحو الوافي / عباس حسن. قواعد الإملاء في عشرة دروس سهلة / د. فهمي النجار في الادب الحديث / أ.د. فائق مصطفى في الادب المعاصر / د. بشير عيسوي الادب العربي في العصر الحديث / د. مصطفى السحرني
Websites	

Course Description Form

1. Course Name:	
Physics	
Course Code:	
E106	
Semester / Year:	
1/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 5	
SWL (hr/sem) 125	
Course administrator's name (mention all, if more than one name)	
Name: Assistant Lecturer Anwer Musa	
Email:	
Course Objectives	
Course Objectives	Diodes circuits: Diode operation and i-v characteristics, Regions of operation, models, and limitations, Tunnel, Zener, Varicap, LED, Photo, Laser, Microwave diodes, Single diode circuits, the load line, Multi-diode circuits, Rectifiers, dc-dc converters, Clipping and clamping, Electronic gates, Diode logic (AND & OR functions). Bipolar transistors and logic families: NPN and PNP transistor operation, i-v characteristics, Regions of operation, models, and limitation, Transfer characteristic of BJT with load resistor, Biasing for logic and amplifier applications, Logic level definitions, The differential pair as a current switch, Transistor-transistor logic – inverters, NAND, other functions, Emitter-coupled logic – OR/NOR gate, other functions, Low voltage bipolar logic families. MOS transistors and biasing: Field-effect transistor operation, i-v characteristics NMOS, Regions of operation, models, and limitations, Enhancement and depletion-mode devices, PMOS devices, Transfer characteristic of FET with load resistor, Biasing for logic and amplifier

applications. MOSFETS, MESFET, and BIMOS transistors.

Teaching and Learning Strategies

Strategy

Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Week 1: Diode Operation and Characteristics	Theoretical	
2			Week 2: Diode Circuit Analysis and Rectifiers		
3			Week 3: Diode Application Clippers, Clampers, and Logic Gates		
4			Week 4: Introduction to Bipolar Junction Transistor (BJTs)		
5			Week 5: BJT Biasing and Operation Regions		
6			Week 6: BJT as a Switch and Logic Inverters		
7			Week 7: Transistor-Transistor Logic (TTL) and Logic Families		

8			Week 8: Emitter-Coupled Logic (ECL) and Low-Voltage Bipolar Logic		
9			Week 9: Introduction to Field Effect Transistors (FETs)		
10			Week 10: MOSFET Operation and Characteristics (NMOS & PMOS)		
11			Week 11: MOSFET Biasing and Operating Regions		
12			Week 12: MOSFET as a Switch and Digital Logic		
13			Week 13: Comparison of BJT and MOSFET Devices		
14			Week 14: Special Devices: Tunnel, Zener, and Other Diodes		
15			Week 15: Special Devices: MESFET and BIMOS Transistors		

Course Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 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	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Learning and Teaching Resources

	Text
Required Texts	
Recommended Texts	
Websites	

Course Description Form

1. Course Name:	
Engineering Drawings-II	
Course Code:	
E102	
Semester / Year:	
2/2024	
Description Preparation Date:	
Available Attendance Forms:	
Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 4	
SWL (hr/sem) 100	
Course administrator's name (mention all, if more than one name)	
Name: Lecturer Hanan Majeed Hameed Al Shaabani	
Email:	
Course Objectives	
Course Objectives	· Introduction · Graphic Instruments and Their Use · Lettering · Graphic Geometry · Multi View Ortho Graphic Projection in First and Third Angle Projection · Dimensions · Third View · Isometric Drawing and Sketching · Oblique Drawing · Section of Isometric Drawing Sectional View
Teaching and Learning Strategies	
Strategy	
Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			GettingStarted AutoCAD 2021 User Interface , Drawing Units and Limits	practical	
2			Basic Drawing Skills Drawings , Draw Lines and Rectangles , Draw Circles, Arcs, and Polygons		
3			Shaping Curves Draw and Edit Curved Polylines Draw Ellipses Shape Splines		
4			Editing Entities1 Can Erase, and Undo , Use Coordinate Systems , Use Fillet and Chamfer		
5			Editing Entities2 Create Selection Sets Move and Copy Work with Arrays Use Trim and Extend		
6			Editing Entities3 Use Lengthen and Stretch Use Offset and Mirror Edit with Grips		
7			Drawing Aids Use Grid and Snap , Employ Ortho and Polar Tracking , Use Polar Snap , Select Running Object Snaps , Apply Object Snaps Tracking		
8					
9			Dimensioning Set Dimensions , Align Dimensions , Baseline Dimensions		
10			Object Visibility and Appearance Change Object Properties Set the Current Layer Manage Layer Properties Control Layer Visibility Apply Linetype		
11					

12			Hatching and Gradients Specify Hatch Areas . Hatch with Patterns . or Gradients		
13			Organizing Objects Define Blocks Insert Blocks Edit Blocks Work with Groups		
14			Creating and Editing Text Style Text , Write Lines Text , Write and Format Paragraphs Using MTEXT Edit Text		
15			Working with Data Import Sketch Up Models , Insert Attributed Blocks , Edit Table Styles and Create Tables		
16			Modeling in 3D Create and Edit Surface Models , Create Solid Models , Create Renderings Navigating 3D Models Use Visual Styles , Navigate with the View Cube , Use Camera , Navigate with SteeringWheels		
			Preparatory week before final Exam		

Course Evaluation

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

	Summative assessment	Final Exam	2hr	50% (50)	16	All	
	Total assessment			100% (100 Marks)			

Learning and Teaching Resources

	Text
Required Texts	AutoCAD 2022 Tutorial First Level 2D Fundamentals
Recommended Texts	AutoCAD® 2018 and AutoCAD LT 2018ss
Websites	https://www.youtube.com/watch?v=ewhcG-tUNzk&list=PLrOFa8sDv6jfbKw11Ez9hXbCZ17ir-Na5

Course Description Form

1. Course Name:	
Electrical Circuits Analysis	
2. Course Code:	
EE202	
3. Semester / Year:	
3/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits	5
SWL (hr/sem)	125
7. Course administrator's name (mention all, if more than one name)	
Name: Professor Haider M. AlSabbagh Email: haider.alsabbagh@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives	1- Understand and analyze resistive circuits containing dependent and independent sources. This chapter focuses on various circuit analysis techniques including mesh analysis, super mesh, nodal analysis, and super node. It also covers Thevenin and Norton equivalent circuits, superposition analysis, maximum power transfer to develop skills in simplifying and solving complex electrical networks. 2- To explore the transient response of different structures of electrical circuits: RL, RC, and RLC circuits in series and parallel configurations. This aims to provide a thorough understanding of the time-dependent behavior of these circuits and the mathematical tools required to analyze their complete response over time. 3- To introduce and apply sinusoidal steady-state analysis to AC circuits. The chapter focuses on phasor representation, mesh and nodal analysis for

	circuits, and the application of Thevenin and Norton equivalents in AC scenarios. It also covers superposition analysis and the calculation of power, aiming to provide a comprehensive approach to analyzing and solving AC circuit problems. To understand the principles and applications of power in AC phase circuits, particularly focusing on single-phase and three-phase systems (both balanced and unbalanced) with star and delta connections. The chapter aims to develop skills in analyzing power distribution and consumption in three-phase circuits, which are essential in practical electrical engineering and power systems.
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9. Teaching and Learning Strategies

Strategy	The basic strategy adopted in understanding this subject is to link the theoretical material and theoretical issues with the practical reality of that theoretical aspect.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Resistive circuits with dependent sources:	Theoretical and Lab.	
2			Nodal analysis		
3			Linearity and Superposition:		
4			Basic RC and RL Circuits:		
5			Driven RC circuits		
6			Driven RL circuits		

7			The RLC Circuit:		
8			Sinusoidal steady state analysis:		
9			The complex forcing function		
10			Nodal and mesh analysis		
11			Superposition analysis		
12			Poly-phase Circuits:		
13			Three-phase Y connection		
14			Power in 3-phase circuits		
15			Tutorial about the study subjects		
16			Preparatory week before the final Exam		

11. Course Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	20% (20)	Continuous	All

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

12. Learning and Teaching Resources

	Text
Required Texts	Electrical Circuits Analysis
Recommended Texts	Electrical Circuits Analysis
Websites	

Course Description Form

1. Course Name:	
Comprehensive Vector and Multivariable Calculus	
2. Course Code:	
EE201	
3. Semester / Year:	
3/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 6 SWL (hr/sem) 150	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Prof. Ali K. Marzook Email: ali.marzook@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives	1.To develop problem-solving skills understanding of vectors, partial derivatives, multiple integrals through examples and solved problems. 2.To understand the three-Dimensional Coordinate Systems and vector functions. 3.To study functions depending on more than one independent variable, especially partial derivatives. 4.To introduce Tangent Planes and Normal Lines. 5.To understand Double Integrals over general regions. 6.To understand Triple Integrals in rectangular, cylindrical, and spherical coordinates.
9. Teaching and Learning Strategies	
Strategy	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive

tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			vector; scalars and vector component of a vector rules of vector arithmetic	Theoretical	
2			norm of a vector normalizing of vectors, dot product, cross product.		
3			product of three or more vectors, equations of line in space, planes in 3-space		
4			Vector-valued functions limits and continuous derivatives.		
5			forms of a curve equation in space, parametric representation, unit tangent and normal vectors.		
6			curvature, radius of curvature, motion along a curve.		
7			velocity, acceleration and speed.		
8			normal and tangential components of acceleration.		

9			Partial differentiation: Function of two or more variables, limits and continuity, partial derivatives, partial derivatives of functions of two variables, partial derivatives of functions with more than two variables.		
10			the chain rule, the chain rule for derivatives, the chain rule for partial derivatives, directional derivatives and gradients, directional derivatives, the gradient, tangent plans and normal vectors.		
11			maxima and minima of functions of two variables, Lagrange multipliers.		
12			Multiple integrals: Double integral, areas and volumes		
13			double integral in polar coordinates, parametric surfaces.		
14			surface area, surface integrals.		
15			evaluation of volume and triple integral.		
16			Preparatory week before the final Exam		

11. Course Evaluation

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

12. Learning and Teaching Resources

	Text
Required Texts	Thomas' Calculus
Recommended Texts	Calculus
Websites	

Course Description Form

1. Course Name:	
DC Machines	
2. Course Code:	
EE204	
3. Semester / Year:	
3/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits	5
SWL (hr/sem)	125
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Prof. Khalid M. Abdul Hassan	
Email:	
8. Course Objectives	
Course Objectives	1.Introduction to the importance of electrical machines and their classification. 2–Learn about the installation of a direct current machine. 3–Knowing the types of windings used in DC machines 4–Knowing the magnetic performance of the machine from a magnetic circuit, the reaction of the production arm, and the flux of the main and auxiliary poles 5–Know the types of direct current generators and motors, the characteristics of each, their uses and applications. 6–Acquire the skill in conducting calculations related to the electrical and mechanical loads of direct current machines, as well as calculations of the machine's electrical and magnetic characteristics.
9. Teaching and Learning Strategies	

Strategy		The basic strategy adopted in understanding this subject is to link the theoretical material and theoretical issues with the practical reality of that theoretical aspect.			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			General principle of rotational electrical machines, calculation of induced e.m.f. and L energy	Theoretical and Laboratory	
2			power, and torque in machines, construction of machines		
3			function of commutator, type of armature windings calculation of mmf per pole, type of excitation		
4			connections, armature reaction, commutation		
5			, type and characteristics of DC generators.		
6			parallel operation of DC generators.		
7			losses and efficiency of DC machines		
8			Principle of operation of DC motors		
9			calculation of speed, calculation of torque		
10			starting of DC motors		

11			characteristics of DC motors and their type		
12			speed control of DC motors		
13			Electric breaking,		
14			testing of a DC machines . Preparatory week before the final Exam		

11. Course Evaluation

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

12. Learning and Teaching Resources

	Text
Required Texts	Principle of electrical Machines and their applications
Recommended Texts	Electrical technology
Websites	

Course Description Form

1. Course Name:	
Electronic Circuits	
2. Course Code:	
EE201	
3. Semester / Year:	
3/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 9	
SWL (hr/sem) 225	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Prof.Abdul-Basset A. Al-Hussein	
Email: abdulbasset.jasim@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives	The Electronic Circuits module aims to: 1. Provide foundational knowledge in electronic components, including different types of transistors (BJT, FET) and their operation. 2. Develop skills in circuit analysis, transistor modeling, and design, including small-signal and large-signal analysis. 3. Enhance practical abilities through hands-on work, focusing on RLC and Diodes circuits testing. 4. Prepare students for advanced topics in electronics and related fields. 5. Introduce industry practices relevant to electronic circuit design and applications.
9. Teaching and Learning Strategies	
Strategy	The basic strategy adopted in understanding this subject is to link theoretical material and theoretical issues with the practical reality that theoretical aspect.

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Introduction Amplifier des (DC analysis)	Theoretical	
2			AC analysis: voltage gain, current gain, power gain, scale, frequency domain characteristics		
3			Definition of small signal transistor, Bias circuits linear amplification, voltage current, power gain		
4			Amplifier configurations		
5			Multistage Amplifiers cascade		
6			Driven RL circuits		
7			Mid-term Exam +Types of multistage FET's amplifiers (cascade, Cascode)		
8			Differential Amplifiers		
9			Frequency Response: Low frequency response of the CS and CE amplifiers, internal capacitive effects and the high frequency model of the FET and the BJT		
10			Review of high frequency response of CS and CE amplifiers, high frequency		

11			response of the CG and cascade amplifiers, high frequency response of source and emitter followers.		
12			Introduction of Feedback Amplifier: types, effects and topologies, feedback analysis		
13			Topologies: voltage-series, voltage shunt, current – series, and current-shunt		
14			Introduction of Power Amplifiers: Series-fed class A amplifier		
15			Transformer-coupled Class A amplifier, class B amplifier		
16			Amplifier distortion, power transistor heat sinking, class AB and push-pull amplifiers, class C		
			Preparatory week before the final Exam		

11. Course Evaluation

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

12. Learning and Teaching Resources

	Text
Required Texts	Electronic Devices and Circuit Theory
Recommended Texts	Floyd - DIGITAL FUNDAMENTALS

Course Description Form

1. Course Name:	
Microprocessors and Microcontrollers	
2. Course Code:	
EE203	
3. Semester / Year:	
3/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 5	
SWL (hr/sem) 125	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant.Prof.IsraaS.AlFurati	
Email: israa.sabri@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives	1.To understand the basics of microprocessors microcontrollers architectures and functionalities. 2.To develop an in-depth understanding of operation of microprocessors and microcontroller machine language programming & interfacing techniques. 3.To design and develop Microprocessor microcontroller based systems for real time applications using low level language like ALP. To understand the concepts of processor.
9. Teaching and Learning Strategies	
Strategy	We will try to use good learning strategies to engage students in active learning by using a variety of activities such as visualization, discussion, thinking or problem-solving. These activities promote analysis, synthesis, and the evaluation of class content. Equally important, they provide students with opportunities for feedback

how well they understand course material, ensuring they are making meaningful progress toward achieving course objectives.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Introduction Microprocessors	Theoretical and Lab	
2			8086 Architecture		
3			Programming model		
4			Memory Organization		
5			Instruction Set and Assembly Language Programming Of 8086		
6			Arithmetic Expressions		
7			Stack of 8086		
8			Interrupts of 8086		
9			MS-DOS Function Calls (INT 21h)		
10			Examples		
11			Introduction to Microcontrollers		

12			Microprocessor via Microcontroller		
13			Overview of 8051 Microcontroller		
14			Architecture of 8051 Microcontroller		
15			ARM Processor		
16			Preparatory week before the final Exam		

11. Course Evaluation

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

12. Learning and Teaching Resources

	Text
Required Texts	Microprocessor and Microcontrollers
Recommended Texts	The 8088 and 8086 microprocessors programm interfacing, hardware
Websites	

Course Description Form

1. Course Name:	
Arabic Language	
2. Course Code:	
UOB107	
3. Semester / Year:	
4/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits	2
SWL (hr/sem)	50
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Wjdan Sadiq	
Email:	
8. Course Objectives	
Course Objectives	إكتساب الطالب مهارة معرفية عن المفاهيم اللغوية . صون اللسان من الوقوع في الخطأ في نطق الكلمة . تنمية قدرات الطالب التعبيرية . تعليم الطلبة على تحليل منظومة الكلام . تعليم الطلبة على التمييز بين أصول الكلمة أو الزيادة وما تؤديه زيادة المعنى . تعليم الطلبة على أساليب وقواعد ضبط المفردات وصياغتها . تمكين الطالب على استعمال المفردات اللغوية بالموقع السليم . تقديم تدريبات لتقوية ملكة الطالب وتنمية مقدرته في الممارسة اللغوية والبلاغة المؤثرة مع الافادة من الخبرات والتدريبات . تمكين الطلبة من قراءة وتحليل النصوص الادبية وفهمها والقدرة على حفظها . تعليم الطلبة القراءة الصحيحة لآيات القرآن الكريم ومعرفة معاني وتنمية قدرة الطلبة على الحفظ والنطق السليم
9. Teaching and Learning Strategies	

Strategy	1- تقديم المحاضرة بشكل منسق ووفقا للوقت المحدد. 2- إعطاء الطلبة واجبات صفية وتكليفهم بتقديمها على المنصة. 3- إعطاء نسبة من الدرجة للأنشطة المقدمة من قبل الطلبة.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			النحو - اقسام الكلام (وفعل وحرف)	Theoretical	
2			المبتدأ وانواعه		
3			الخبر وانواعه		
4			كان واخواتها		
5			إن واخواتها		
6			المثنى والملحق به		
7			جمع المذكر والملحق به		
8			جمع المؤنث والملحق به		
9			الاسماء الخمسة		
10			بناء الفعل الماضي		
11			بناء الفعل الامر		
12			الفعل المضارع واعرابه		
13			الاسماء المنصبة (المفعول به - المفعول به)		

14			المطلق – المفعول لاجل المفعول فيه – المفعول معه		
15			الشعر – نازك الملائكة		
16			الشعر – محمد مهدي الجواهري		
			Preparatory week before the final Exam		

11. Course Evaluation

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

12. Learning and Teaching Resources

	Text
Required Texts	مبشر والإنشاء والرسم الكتابي والإملاء الخطي / أ.د. عبد الرحمن مطلق الجبوري
Recommended Texts	أقرأ أن الكريم النحو الوافي / عباس حسن قواعد الإملاء في عشرة دروس سهلة / د. فهمي النجار في الأدب الحديث / أ.د. فائق مصطفى في الأدب المعاصر / د. بشير عيسوي الأدب العربي في العصر الحديث / د. مصطفى السحرتي
Websites	

Course Description Form

1. Course Name:					
Baath Party crimes					
2. Course Code:					
UOB105					
3. Semester / Year:					
4/2024					
4. Description Preparation Date:					
5. Available Attendance Forms:					
6. Number of Credit Hours (Total) / Number of Units (Total)					
ECTS Credits 2					
SWL (hr/sem) 50					
7. Course administrator's name (mention all, if more than one name)					
Name: Hussain Jasim					
Email:					
8. Course Objectives					
Course Objectives			أن مادة جرائم حزب البعث البائد من المواد الهامة والضرورية للطلبة لكونها تعرفهم بالاحداث والظروف والانتهاكات التي شهدها العراق منذ عام 1968 حتى عام 2003. حيث توضح المادة للطلبة وتعرفهم على اثار سلوكيات نظام البعث البائد على المجتمع العراقي		
9. Teaching and Learning Strategies					
Strategy		القدرة على معرفة جرائم حزب البعث البائد			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			انتهاكات الحقوق والحريات نبذة وصفية عن الانظمة السياسية العراق (1921-2003)	Theoretical	
2					

3			انتهاكات النظام البعثي للحريات العامة		
4			اثر سلوكيات النظام البعثي في المجتمع وتسلمه على الدولة		
5			اثر المرحلة الانتقالية في محاسن السياسة الاستبدادية		
6			الميدان النفسي		
7			الميدان الاجتماعي		
8			الدين والدولة		
9			الثقافة والاعلام وعسكرة المجتمع		
10			اثر القمع والحروب على السكان		
11			استعمال الاسلحة المحرمة والتلوث البيئي		
12			سياسة الارض المحروقة		
13			تجفيف الاهوار والهجرة القسرية		
14			تدمير البيئة الزراعية والحيوية والتلوث الاشعاعي		
15			المقابر الجماعية وقصف دور العبادة		
16			Preparatory week before the final Exam		
11. Course Evaluation					

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

12. Learning and Teaching Resources

	Text
Required Texts	منهاج جرائم حزب البعث البائد 2023
Recommended Texts	منهاج جرائم حزب البعث البائد 2023
Websites	

Course Description Form

1. Course Name:	
Electrical Transformers	
2. Course Code:	
EE208	
3. Semester / Year:	
4/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 5	
SWL (hr/sem) 125	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Prof. Khalid M. Abdul Hassan	
Email:	
8. Course Objectives	
Course Objectives	1. To understand the principle of transformers, E.M.F and transformer construction. 2. To understand and study transformer on no load and on load. 3. To understand the transformer equivalent circuit and Separation of core losses. 4. To study the Regulation of transformer, Loss and efficiency. 5. To study the Parallel operation of transformer Three-phase transformer, connections and cooling of transformers.
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is 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.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Transformers working, principle of transformers	Theoretical and Lab	
2			Transformer construction, E.M.F equation.		
3			Transformer on no load and on load (R load, load, RC load).		
4			equivalent circuit and phasor diagram Transformers.		
5			Open and short circuit test		
6			Separation of core losses		
7			Regulation of transformer		
8			Mid-term Exam		
9			Losses and efficiency		
10			All-Day efficiency		
11			Auto transformer		
12			Parallel operation		

13			Three-phase transform connections		
14			Open-Delta-Scoot connection		
15			cooling of transformers		
16			Preparatory week before the final Exam		

11. Course Evaluation

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

12. Learning and Teaching Resources

	Text
Required Texts	Principle of electrical Machines and their applications
Recommended Texts	Electrical technology
Websites	

Course Description Form

1. Course Name:	
Electromagnetic Fields	
2. Course Code:	
EE206	
3. Semester / Year:	
4/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits	7
SWL (hr/sem)	175
7. Course administrator's name (mention all, if more than one name)	
Name: Prof. Ali Amin Abduljabar	
Email: ali.abduljabar@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives	• Develop a Fundamental Understanding To provide students with a solid foundation in theory and principles of electric and magnetic fields, including their mathematical representation and physical interpretations. • Apply Maxwell's Equations To enable students to understand, derive, and apply Maxwell's equations in both differential and integral forms to describe electromagnetic phenomena. • Bridge Theory and Practical Application To relate theoretical electromagnetic concepts to real-world applications in engineering, such as antennas, transmission lines, wave propagation, and electromagnetic compatibility. • Enhance Analytical Skills To cultivate analytical problem-solving skills through the use of vector calculus and differential equations.

	equations in the analysis of static and dynamic electromagnetic fields. • Use Computational Tools To introduce students to computational methods and simulation tools (e.g., MATLAB, COMSOL, ANSYS) for modeling and visualizing electromagnetic field distributions. • Foster Independent Learning and Research To encourage critical thinking, self-directed learning, and the ability to research current trends and advancements in electromagnetic field theory and applications.
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9. Teaching and Learning Strategies

Strategy	The module employs a range of teaching and learning strategies to develop both theoretical understanding and practical competence in electromagnetic field theory and its applications. 1. Lectures - o Delivered weekly to introduce and explain key principles, laws, and mathematical frameworks. - o Use of visualizations, demonstrations, and real-world examples to enhance conceptual clarity. 2. Interactive Tutorials - o Problem-solving sessions focused on applying theoretical concepts to practical problems. - o Encourages analytical thinking, peer collaboration, and active engagement with course material. 3. Laboratory and Simulation-Based Learning - o Practical experiments and software-based simulations (e.g., MATLAB, COMSOL, ANSYS HFSS) to investigate electromagnetic field behavior. - o Reinforces theoretical learning and develops computational modeling skills. 4. Self-Directed Learning - o Guided reading materials, videos, and online resources provided through the Virtual Learning Environment (VLE). - o Encourages independent study and deeper exploration of challenging concepts. 5. Project-Based Learning
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	- o Application-oriented projects or case studies allowing students to investigate real-world electromagnetic systems (e.g., antenna analysis, waveguide modeling). - o Develops problem-solving, teamwork, and communication skills. 6. Formative Assessments and Feedback - o Regular quizzes, assignments, and in-class activities to assess understanding and provide continuous feedback. - o Helps identify misconceptions and target areas for improvement early in the learning process. 7. Blended Learning Approach (where applicable) - o Integration of online modules or flipped classroom techniques to support flexible and active learning. - o Pre-recorded content and digital exercises supplement in-person teaching. 8. Academic Support and Office Hours - o Dedicated time for individual consultations, addressing specific academic queries and supporting student progress.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			coordinate systems	Theoretical	
2			Vector analysis		
3			Electric field intensity		
4			Electric flux density and gauss's law		
5			Electric flux density and gauss's law: gauss's law application on a surface charge		

6			Work, potential & potential difference		
7			dielectric – dielectric boundary condition conductor		
8			Magneto-statics: the static magnetic fields		
9			Magneto-statics		
10			Magnetic forces, work power		
11			Magnetic forces, work power: time varying fields		
12			Maxwell's equations: the vector operator		
13			Maxwell's equations: derivation of Maxwell equations		
14			Maxwell's equations: the uniform plane wave		
15			Maxwell's equations: wave propagation in free space		
16			Preparatory week before the final Exam		

11. Course Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11

	Assignments	2	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	20% (20)	Continuous	All
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

12. Learning and Teaching Resources

	Text
Required Texts	Engineering electromagnetic fields and waves." New York (1975)
Recommended Texts	Electromagnetic fields and Waves.
Websites	

Course Description Form

1. Course Name:	
English Language II	
2. Course Code:	
UOB106	
3. Semester / Year:	
4/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 2 SWL (hr/sem) 50	
7. Course administrator's name (mention all, if more than one name)	
Name: Ali A. Al-Azza Email: ail.noaman@uobasarah.edu.iq	
8. Course Objectives	
Course Objectives	1. Provide students with essential information in English language in association with reading, writing and speaking skills, and knowing more English vocabulary. 2. To understand sentences, tenses, and practice writing. 3. This module works towards enhancing students' English language competencies along with their technical or professional knowledge. 4. Enhancing students' communication skills. English can result in better job opportunities in the future.
9. Teaching and Learning Strategies	
Strategy	The main strategies that will be adopted in delivering this module are: - Allow students to actively participate in the learning process with class discussions and exercises that support the initiative. - Use didactic questioning through questions to determine students' understanding of the material.

	- Writing an assignment and report that encourages students clarify and organize their thinking and independently research a present on a topic.				
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Tenses (Present, Past, and Future), Question Words	Theoretical	
2			Present Tenses (Present Simple, Present Continuous)		
3			have/have got Past Tenses (Past Simple, Past Continuous)		
4			Vocabulary: Buying Things		
5			Verb Patterns 1, Future intentions		
6			What 'sit like? Comparative and superlative adjectives		
7			Present Perfect and Past Simple, for and since, Tense revision		
8			Have (got) to, Should, Must		
9			Time and Conditional Clauses, What if?		
10			Verb Patterns 2, Infinitive Purpose, (What, etc)		

11			infinitive), (something etc.+ infinitive)		
12			Active and Passive Voice		
13			Second conditional, might : Present Perfect Continuous, Present		
14			Perfect Simple versus Continuous		
15			Past Perfect, Reported statements		
16			Distinguish make and will and would, like, allow unlike, and dislike, and other, another, and other		
			Preparatory week before the final Exam		

11. Course Evaluation

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

12. Learning and Teaching Resources

	Text
Required Texts	New Headway Plus/ Pre-Intermediate, John and Liz So Oxford University Press
Recommended Texts	Understanding and Using English Grammar, 5th Edit Betty S. Azar Stacy A. Hagen

Course Description Form

1. Course Name:	
Introduction to Electrical Networks	
2. Course Code:	
EE205	
3. Semester / Year:	
4/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 7	
SWL (hr/sem) 175	
7. Course administrator's name (mention all, if more than one name)	
Name: Prof.Haider M. AlSabbagh	
Email: haider.alsabbagh@uobasrah.edu.iq	
8. Course Objectives	
Course Objectives	1. Ability to understand the AC Circuit Po Analysis and Poly-phase Circuits 2. Ability to determine the Transient Response RL /RC Circuit and the Transient Response of R Circuit 3. Ability to analysis Magnetically Coupled Circ and Ideal Transformers 4. Ability to solve the mathematical equations Complex Frequency, Laplace Transfo Frequency Response and Fourier Circuit Analy 5. Ability to synthesize the Circuit Analysis in s-Domain and Two-Port Networks
9. Teaching and Learning Strategies	
Strategy	The main strategy that will be adopted in delivering this module is encourage students' participation in the exercises, while at the sam time refining and expanding their critical thinking skills. This will achieved through classes, interactive tutorials and by considering ty

of simple experiments involving some sampling activities that are interesting to the students.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Introduction; syllabus Advantages and Disadvantages of Electrical Networks as a different circuits .	Theoretical and Lab	
2			Two-Port Networks : Open port networks		
3			Two-Port Networks : y-z and g parameters		
4			Two-Port Networks : ABCD parameters		
5			Complex Frequency		
6			Circuit Analysis in the s-Domain		
7			Frequency Response		
8			Bode Diagrams		
9			Mid-term Exam		
10			Filters: Constant k-filters Low pass and high pass		
11					

12			Filters: modern filter design, Butterworth and Chebyshev filters		
13			Filters: Network transformations		
14			All pass filter		
15			Active filter		
16			Fourier circuit analysis		
			Preparatory week before the final Exam		

11. Course Evaluation

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

12. Learning and Teaching Resources

	Text
Required Texts	Engineering Circuit Analysis Eight Edition
Recommended Texts	Electric Circuits Tenth Edition
Websites	

Course Description Form

1. Course Name:	
Mathematical Analysis and Transform Techniques	
2. Course Code:	
E202	
3. Semester / Year:	
4/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 5	
SWL (hr/sem) 125	
7. Course administrator's name (mention all, if more than one name)	
Name: Assist.Prof. Ali K. Marzook	
Email:	
8. Course Objectives	
Course Objectives	1.To develop problem solving skills and understanding of related engineering mathematical topics 2.To develop skills in evaluating multiple integrals in different coordinate systems covering physical applications. 3.To perform integration of vectors. 4.To understand Laplace transform and its properties. 5.To understand Fourier analysis and transform for signal analysis and spectral measure.
9. Teaching and Learning Strategies	
Strategy	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 group based solving problems.
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Basic Definitions, Physical applications	Theoretical	
2			Triple integral, cylindrical coordinates, Spherical coordinates.		
3			Line Integrals, Double Integrals,		
4			Green's Theorem, Surface area and surface Integrals		
5			Stokes's Theorem, Divergence Theorem.		
6			Laplace Transforms Linearity. First Shifting Theorem (s-Shifting Transforms of Derivatives and Integrals		
7			Unit Step Function, Second Shifting Theorem (Second Shifting), Short Impulses Dirac's Delta Function Partial Fractions, Gamma functions		
8			Other useful properties Convolution. Integral Equations, Differentiation and Integration Transforms, Systems of ODEs		

9			Inverse Laplace Transform General Formulas and Applications		
10			Solution of PDEs by Laplace Transform		
11			Arbitrary Period. Even and Odd Functions. Half-Range Expansions, Forced Oscillations		
12			Approximation by Trigonometric Polynomial Sturm–Liouville Problems Orthogonal Functions, Orthogonal Series.		
13			Generalized Fourier Series The use of Fourier Series spectral analysis		
14			Fourier Integral, Fourier Cosine and Sine Transforms, Fourier Transform.		
15			Fourier Transform properties, Fourier Transform of some useful functions		
16			Preparatory week before the final Exam		

11. Course Evaluation

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11

	Assignments	2	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	20% (20)	Continuous	All
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	2 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

12. Learning and Teaching Resources

	Text
Required Texts	Thomas Jr GB, Weir MD, Hass J, Heil C, “Thomas' Calculus: Early Transcendentals”, Pearson, 13th Edition 2014.
Recommended Texts	[1] Erwin Kreyszig, “Advanced Engineering Mathematics”, John Wiley & Sons Inc, 10th Ed. 2011 [2] Thomas and Finney, “Calculus and Analytic Geometry”, Pearson Education Inc, 9th
Websites	

Course Description Form

1. Course Name:	
Communication Theory	
2. Course Code:	
EE304	
3. Semester / Year:	
5/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 5	
SWL (hr/sem) 125	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor Falih M. Mussa	
Email:	
8. Course Objectives	
Course Objectives	The aim of this module is to provide students with a solid foundation in the principles and mathematical framework underlying modern communication systems. It focuses on the analysis and design of analog and digital communication techniques used in wired and wireless systems. Specifically, the module aims to: 1. Introduce the fundamental concepts of information transmission, signal modulation, and noise analysis. 2. Develop mathematical tools and models for analyzing the performance of communication systems under various channel conditions. 3. Explore analog and digital modulation schemes, bandwidth efficiency, and power considerations. 4. Examine the impact of noise, distortion, and interference on communication system reliability and quality.

5. Prepare students for advanced study or career in telecommunications, wireless communications, signal processing, and related areas.

9. Teaching and Learning Strategies

Strategy

- Lectures with Conceptual Emphasis
 - Present foundational theory with clear derivations and practical examples.
 - Use visual aids such as signal waveforms, spectra, and block diagrams.
 - Integrate periodic concept checks or quick quizzes to enhance engagement.
- Tutorials and Problem-Solving Sessions
 - Provide guided exercises on information theory calculation, modulation/demodulation, and noise analysis.
 - Encourage group discussions and peer-to-peer learning for tackling complex problems.
 - Use step-by-step approaches to build problem-solving confidence.
- Simulation and Laboratory Work
 - Incorporate MATLAB or Python-based labs for signal generation, modulation, noise addition, and demodulation.
 - Allow hands-on exploration of BER curves and system performance under varying conditions.
 - Use real hardware or software-defined radio kits (if available) to demonstrate concepts practically.
- Blended Learning Approaches
 - Supplement lectures with online video tutorials, animations, and interactive applets for visualization.
 - Use platforms like Coursera, MIT OpenCourseWare, or Khan Academy for self-paced reinforcement.
- Case Studies and Real-World Examples
 - Discuss communication standards (e.g., GSM, LTE, WiFi) to contextualize theoretical concepts.
 - Analyze recent developments in wireless communications or digital broadcasting to inspire interest.
- Formative Assessments and Feedback
 - Conduct quizzes, mini-projects, or assignments to provide timely feedback.
 - Use peer assessment and self-assessment tools to promote reflective learning.
- Group Projects or Presentations (optional)
 - Assign collaborative projects on designing basic communication systems or analyzing communication channels.

- Encourage presentations to build communication skills and technical confidence.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Introduction Communication Systems		
2			Information Theory Basics		
3			Channel Capacity and Mutual Information		
4			Signal Representation and Noise		
5			Analog Modulation Techniques I		
6			Analog Modulation Techniques II		
7			Demodulation and Detection		
8			Digital Communication Fundamentals		
9			Digital Modulation Techniques I		
10			Digital Modulation Techniques II		
11			Noise and System Performance		

12			Multiplexing Techniques		
13			Communication System Design Considerations		
14			Simulation and Practical Labs		
15			Revision and Exam Preparation		
16			Preparatory work before the final Exam		

11. Course Evaluation

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

12. Learning and Teaching Resources

	Text
Required Texts	Communication Systems
Recommended Texts	Communication Systems
Websites	

Course Description Form

1. Course Name:	
Engineering Analysis	
2. Course Code:	
EE301	
3. Semester / Year:	
5/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 6 SWL (hr/sem) 150	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor Hisham L. Swadi Email:	
8. Course Objectives	
Course Objectives	The aim of this module is to develop students' ability to apply mathematical, analytical, and computational methods to solve fundamental engineering problems. It equips students with the tools and techniques required for modeling, analyzing, and interpreting engineering systems and data across various disciplines. Specifically, the module aims to: 1. Introduce core mathematical methods used in engineering analysis, including algebra, calculus, linear algebra, and differential equations. 2. Develop students' problem-solving skills by applying these methods to mechanical, electrical, and engineering problems. 3. Promote the use of computational tools (e.g., MATLAB, Excel) to model and simulate engineering systems. 4. Strengthen analytical thinking and logical reasoning in the context of physical systems and technical challenges.

5. Provide a foundation for advanced topics in engineering mathematics, control systems, signal processing, fluid dynamics, and thermodynamics.

9. Teaching and Learning Strategies

Strategy

1. **Lectures**
 - Deliver core theoretical concepts using visual aids and real-world examples.
 - Use step-by-step problem walkthroughs to model analytical thinking.
2. **Tutorial Sessions**
 - Facilitate guided practice through problem-solving exercises.
 - Encourage peer discussion and collaborative learning.
3. **Laboratory and Computing Workshops**
 - Provide hands-on experience with MATLAB, Python, or Excel for numerical analysis and modeling.
 - Reinforce abstract concepts with simulations and data visualization.
4. **Blended Learning / Online Resources**
 - Supplement in-class teaching with online videos, quizzes, and interactive tools.
 - Use platforms like NPTEL, Khan Academy, or institutional LMS for self-paced learning.
5. **Problem-Based Learning (PBL)**
 - Use real-world engineering scenarios to promote critical thinking and applied mathematics.
 - Encourage students to identify appropriate analytical techniques to solve open-ended problems.
6. **Formative Assessment and Feedback**
 - Incorporate low-stakes quizzes and in-class polls to check understanding.
 - Provide prompt and constructive feedback on assignments and lab tasks.
7. **Group Work and Peer Learning**
 - Promote teamwork on problem sets and projects to enhance communication and collaborative skills.
 - Use peer instruction methods to deepen understanding.
8. **Self-Directed Learning**
 - Encourage the use of additional textbooks, online resources, and tutorials.
 - Assign independent study tasks that challenge students to extend their knowledge beyond the syllabus.
9. **Scaffolded Learning Progression**
 - Structure content from basic to advanced levels, reinforcing prerequisite knowledge.
 - Revisit key concepts in different contexts to promote retention and application.
10. **Integration with Other Modules**

- Show links between mathematical techniques and applications in mechanics, electronics, thermodynamics, etc.
- Encourage transfer of skills to design, simulation, and research projects.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Introduction and Review of Algebra Complex Numbers		
2			Complex Numbers		
3			Integration Techniques		
4			Ordinary Differential Equations (ODEs)		
5			Part 1		
6			Ordinary Differential Equations (ODEs) Part 2		
7			Matrices and Determinants		
8			Eigenvalues and Eigenvectors		
9			Vector Analysis		
10			Numerical Method Root Finding		
			Numerical Method Integration and OD		

11			Data Analysis and Statistics		
12			Fourier and Laplace Transforms (Intro)		
13			Engineering Computation		
14			Review and Exam Preparation		
15			Preparatory work before the final Exam		

11. Course Evaluation

		As	Time/Number	Weight (Marks)	Week Due
Formative assessment	Formative assessment	Quizzes	2	10% (10)	5, 10
	Assignments	Assignments	2	10% (10)	2, 12
	Projects / Lab.	Projects / Lab.	1	10% (10)	Continuous
	Report	Report	1	10% (10)	13
Summative assessment	Summative assessment	Midterm Exam	2 hr	10% (10)	7
	Final Exam	Final Exam	2hr	50% (50)	16
Total assessment			Total assessment	100% (100 Marks)	

12. Learning and Teaching Resources

	Text
Required Texts	Advanced Engineering Mathematics
Recommended Texts	Differential Equations & Linear Algebra

Course Description Form

1. Course Name:	
Analog Electronics	
2. Course Code:	
EE311	
3. Semester / Year:	
5/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 5	
SWL (hr/sem) 125	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor Abdul Basit A. Jasim	
Email:	
8. Course Objectives	
Course Objectives	Operational Amplifiers The ideal OP amplifier, the inverting configuration, non-inverting configuration, difference amplifier, integrators and differentiators, DC imperfections, effect of finite open loop gain and bandwidth on circuit performance, large signal operation of OP Amps, 741 OP-Amp circuit, some OP Amp applications. Active Filters Filters concept, types, direct realization approach, simulated inductance methods, variable frequency scaling methods, state variable filter, cascade realization approach, single operation amplifier structures, voltage controlled voltage source circuit, multiple loop feedback circuits. Oscillators Oscillator concepts, Low frequency oscillators, RC phase shift oscillators, Wien-bridge oscillators, High frequency oscillators, Hartley oscillators, Colpitts oscillators.

	oscillators, Clapp and Meissner oscillators, Negative resistance oscillators, Crystal oscillators. Voltage and Current Regulators Zener diode stabilizers, line regulation, voltage regulators, series regulators, shunt regulators, switching regulators, current regulators, type current, grounded load C.R. Analogue Multiplexers Analogue multiplier operation, characteristics applications. Analogue Multipliers Logarithmic multiplier, quainter-square multiplier, triangle-averaging multiplier, time division multiplier, current rationing multiplier.
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9. Teaching and Learning Strategies

Strategy	11. Lectures ○ Deliver core theoretical concepts using visual aids and real-world examples. ○ Use step-by-step problem walkthroughs to model analytical thinking. 12. Tutorial Sessions ○ Facilitate guided practice through problem-solving exercises. ○ Encourage peer discussion and collaborative learning. 13. Laboratory and Computing Workshops 14. Blended Learning / Online Resources 15. Problem-Based Learning (PBL) 16. Formative Assessment and Feedback ○ Incorporate low-stakes quizzes and in-class polls to check understanding. ○ Provide prompt and constructive feedback on assignments and lab tasks. 17. Group Work and Peer Learning ○ Promote teamwork on problem sets and projects to enhance communication and collaborative skills. ○ Use peer instruction methods to deepen understanding. 18. Self-Directed Learning ○ Encourage the use of additional textbooks, online resources, and tutorials. ○ Assign independent study tasks that challenge students to extend their knowledge beyond the syllabus. 19. Scaffolded Learning Progression ○ Structure content from basic to advanced levels, reinforcing prerequisite knowledge.
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	○ Revisit key concepts in different contexts to promote retention and application. 20. Integration with Other Modules • Show links between mathematical techniques and applications in mechanics, electronics, thermodynamics, etc. • Encourage transfer of skills to design, simulation, and research projects.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Introduction and Review of Algebra Complex Number		
2			Complex Number		
3			Integration Techniques		
4			Ordinary Differential Equations (ODEs) Part 1		
5			Ordinary Differential Equations (ODEs) Part 2		
6			Matrices and Determinants		
7			Eigenvalues and Eigenvectors		
8			Vector Analysis		
9			Numerical Methods – Root Finding		

10			Numerical Methods – Integration and ODEs		
11			Data Analysis and Statistics		
12			Fourier and Laplace Transforms (Intro)		
13			Engineering Computation		
14			Review and Exam Preparation		
15			Preparatory work before the final Exam		

11. Course Evaluation

		Time/Number	Weight (Marks)	Week Due
Formative assessment	Quizzes	2	10% (10)	5, 10
	Assignments	2	10% (10)	2, 12
	Projects / Lab.	1	10% (10)	Continuous
	Report	1	10% (10)	13
Summative assessment	Midterm Exam	2 hr	10% (10)	7
	Final Exam	2hr	50% (50)	16
Total assessment			100% (100 Marks)	

12. Learning and Teaching Resources

	Text
Required Texts	
Recommended Texts	

Course Description Form

1. Course Name:	
AC Machines-I	
2. Course Code:	
EE303	
3. Semester / Year:	
5/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 5	
SWL (hr/sem) 125	
7. Course administrator's name (mention all, if more than one name)	
Name: Assistant Professor Kharia A Mohammed	
Email:	
8. Course Objectives	
Course Objectives	-Three-Phase Induction Motors -Single Phase Induction Motor -Synchronous Machines -Special Machines -Introduction to power electronics -Rectifiers -Converter Operation -Choppers -Inverters
9. Teaching and Learning Strategies	
Strategy	21. Lectures ○ Deliver core theoretical concepts using visual aids and real-world examples. ○ Use step-by-step problem walkthroughs to model analytical thinking. 22. Tutorial Sessions ○ Facilitate guided practice through problem-solving exercises. ○ Encourage peer discussion and collaborative learning. 23. Laboratory and Computing Workshops

	24. Blended Learning / Online Resources 25. Problem-Based Learning (PBL) ○ Use real-world engineering scenarios to promote critical thinking and applied mathematics. ○ Encourage students to identify appropriate analytical techniques to solve open-ended problems. 26. Formative Assessment and Feedback ○ Incorporate low-stakes quizzes and in-class polls to check understanding. ○ Provide prompt and constructive feedback on assignments and lab tasks. 27. Group Work and Peer Learning ○ Promote teamwork on problem sets and projects to enhance communication and collaborative skills. ○ Use peer instruction methods to deepen understanding. 28. Self-Directed Learning ○ Encourage the use of additional textbooks, online resources, and tutorials. ○ Assign independent study tasks that challenge students to extend their knowledge beyond the syllabus. 29. Scaffolded Learning Progression ○ Structure content from basic to advanced levels, reinforcing prerequisite knowledge. ○ Revisit key concepts in different contexts to promote retention and application. 30. Integration with Other Modules • Show links between mathematical techniques and applications in mechanics, electronics, thermodynamics, etc. • Encourage transfer of skills to design, simulation, and research projects.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			-Three-Phase Induction Motor		
2			Single Phase Induction Motor		
3			Synchronous Machines		

4			Special Machine		
5			Introduction power electroni		
6			Rectifiers		
7			Converter Operation		
8			Choppers		
9			Inverters		

11. Course Evaluation

		As	Time/Number	Weight (Marks)	Week Due
Formative assessment	Formative assessment	Quizzes	2	10% (10)	5, 10
	Assignments	Assignments	2	10% (10)	2, 12
	Projects / Lab.	Projects / Lab.	1	10% (10)	Continuous
	Report	Report	1	10% (10)	13
Summative assessment	Summative assessment	Midterm Exam	2 hr	10% (10)	7
	Final Exam	Final Exam	2hr	50% (50)	16
Total assessment			Total assessment	100% (100 Marks)	

12. Learning and Teaching Resources

	Text
Required Texts	Advanced Engineering Mathematics
Recommended Texts	Differential Equations & Linear Algebra

Course Description Form

1. Course Name:	
Control Theory and Systems-I	
2. Course Code:	
EE305	
3. Semester / Year:	
5/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits	6
SWL (hr/sem)	150
7. Course administrator's name (mention all, if more than one name)	
Name: Professor Fadhil R. Tahir	
Email:	
8. Course Objectives	
Course Objectives	1-Introduction and review (4 hrs) Systems, plant, linear dynamical systems, open loop and closed loop (feedback) systems. 2-Modeling of Control Systems (10 hrs) Mathematical model of electrical systems, electromechanical systems, block diagrams, signal flow graph, Mason's rule. Mathematical model of electrical systems, electromechanical systems, block diagrams, signal flow graph, Mason's rule. 3-Time domain analysis (10 hrs) Response of 1st order systems, response of 2nd order systems, step response analysis, performance specifications, static and dynamic error coefficient.

	4–Stability (10 hrs) Analy Stability of dynamical systems, the Routh–Hurwitz stability criterion, root locus analysis 5– Frequency domain Analy (10 hrs) Frequency domain analysis, the Bode diagram, stability in frequency domain, the Nyquist stability criterion. 5. Provide a foundation for advanced topics in engineering mathematics, control systems, signal processing, fluid dynamics, and thermodynamics
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9. Teaching and Learning Strategies

Strategy	31. Lectures 32. Tutorial Sessions - Facilitate guided practice through problem-solving exercises. - Encourage peer discussion and collaborative learning. 33. Laboratory and Computing Workshops 34. Problem-Based Learning (PBL) - Use real-world engineering scenarios to promote critical thinking and applied mathematics. - Encourage students to identify appropriate analytical techniques to solve open-ended problems. 35. Formative Assessment and Feedback - Incorporate low-stakes quizzes and in-class polls to check understanding. - Provide prompt and constructive feedback on assignments and lab tasks. 36. Group Work and Peer Learning - Promote teamwork on problem sets and projects to enhance communication and collaborative skills. - Use peer instruction methods to deepen understanding. 37. Self-Directed Learning - Encourage the use of additional textbooks, online resources, and tutorials. - Assign independent study tasks that challenge students to extend their knowledge beyond the syllabus. 38. Scaffolded Learning Progression - Structure content from basic to advanced levels, reinforcing prerequisite knowledge. - Revisit key concepts in different contexts to promote retention and application. 39. Integration with Other Modules
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- Show links between mathematical techniques and applications in mechanics, electronics, thermodynamics, etc.
- Encourage transfer of skills to design, simulation, and research projects.

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			1-Introduction and review: (4 hrs)		
2			Systems, plant, line dynamical system open loop and closed loop (feedback systems.		
3			2-Modeling of Control Systems: (10 hrs)		
4			Mathematical modeling of electrical system electromechanical systems, block diagrams, signal flow graph, Mason's rule		
5			Mathematical modeling of electrical system electromechanical systems, block diagrams, signal flow graph, Mason's rule		
6			3-Time domain analysis: (10 hrs)		
7			Response of 1st order systems, response		
8			2nd order system step response analysis and performance specifications, steady state		
9					

10			and dynamic error coefficient.		
11			4-Stability Analysis (10 hrs) Stability of dynamic systems, the Routh-Hurwitz stability criterion, root locus analysis		
12			5- Frequency domain Analysis: (10 hrs) Frequency domain analysis, the Bode diagram, the stability in frequency domain, the Nyquist stability criterion.		
13			5. Provide foundation		
14			advanced topics in engineering mathematics, control systems, signal processing, fluid dynamics, and thermodynamics.		
15					

11. Course Evaluation

As	Time/Number		Weight (Marks)	Week Due	
Formative assessment	Quizzes	2	10% (10)	5, 10	
	Assignments	2	10% (10)	2, 12	
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	
Summative assessment	Midterm Exam	2 hr	10% (10)	7	
	Final Exam	2hr	50% (50)	16	
Total assessment		100% (100 Marks)			

12. Learning and Teaching Resources

	Text
Required Texts	

Course Description Form

1. Course Name:	
Power Systems-I	
2. Course Code:	
EE309	
3. Semester / Year:	
5/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits 4	
SWL (hr/sem) 100	
7. Course administrator's name (mention all, if more than one name)	
Name: Lecturer Hamid Wasfi Email:	
8. Course Objectives	
Course Objectives	Sources of Electrical Energy Structure of power system and its elements, m sources of primary energy, power stations, ste hydro, gas turbines, nuclear, M.H.D generat renewable energy sources, solar energy, v generators, other renewable sources, AC and single and 3-phase transmission, development electric power in Iraq. Economical Aspects of Power Systems Economics of generation, load curves, choice of s and number of generator units, effect of sys voltage on transmission efficiency of power sup system, choice of transmission voltage, condu size and Kelvin's law, power factor improvem most economical power factor, tariffs. Mechanical Design of Transmission Lines Conductor materials, line supports, sag, calculatio sag, effect of wind and ice, insulators, volt

	distribution over an insulator string, string efficiency, improving string efficiency. Transmission Line Parameters Line resistance, line inductance, single-phase and three-phase transmission systems, single-phase and three-phase capacitance. Electrical Characteristics of Overhead Transmission Lines Representation of lines, short, medium, long T.L., equivalent circuit of a long transmission line, power factor flow through a transmission line, power circle diagram, line regulation, reactive compensation in a transmission line. Corona Phenomenon, disruptive critical voltage, visual critical voltage, corona losses, factor and conditions affecting corona losses. Underground Cables Conductor materials, insulating materials, sheath and end armouring materials, types of cables, insulation resistance, stress and capacitance, use of intersheaths, capacitance grading, power factor in cables, capacitance in three core cables, thermal characteristics, comparison between overhead lines and underground cables.
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9. Teaching and Learning Strategies

Strategy	• Lectures with Conceptual Emphasis • Tutorials and Problem-Solving Sessions • Blended Learning Approaches • Supplement lectures with online video tutorials, animation and interactive applets for visualization. • Case Studies and Real-World Examples • Formative Assessments and Feedback • Conduct quizzes, mini-projects, or assignments to provide timely feedback. • Use peer assessment and self-assessment tools to promote reflective learning. • Group Projects or Presentations (optional)
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	- Assign collaborative projects on designing basic communication systems or analyzing communication channels. - Encourage presentations to build communication skills and technical confidence.
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10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Sources		
2			Electrical Energy		
3			Structure of power system and elements, major sources of primary energy, power stations, steam hydro, gas turbine nuclear, M.H. generation, renewable energy sources, solar energy, wind generators, other renewable sources		
4			AC and DC single and 3-phase transmission, development of electric power in Iraq.		
5			Economical Aspects of Power Systems		
6			Economics of power generation, load curves, choice of size and number of generator units, effect of system voltage		
7			transmission efficiency of power		

8			supply system choice		
9			transmission voltage, conductor size and Kelvin's law, power factor improvement, mechanical economical power factor, tariffs.		
10			Mechanical Design of Transmission Lines		
11			Conductor materials, line supports, sag calculation of sag effect of wind and ice, insulator		
12			voltage distribution over an insulator string string efficiency improving string efficiency.		
13			Transmission Line Parameters		
14			Line resistance, line inductance, single phase line with multi-conductors		
15			bundling, line inductance three-phase transmission		
16			systems, single phase and three phase capacitance Electrical Characteristics Overhead Transmission Line Representation lines, short		

			medium, long T the equivalence circuit of a lo transmission li power factor flo through transmission li power cir diagram, li regulation, reacti compensation transmission line Corona Phenomenon, disruptive criti voltage, visi critical volta corona loss factor a conditions affecti corona losses. Underground Cables Conductor materials, insulating materials, sheathing e armouring materials, types cables, insulati resistance, stre and capacitance use of intersheat capacitance grading, pow factor in cabl capacitance three core cabl thermal characteristics, comparison between overhe		
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			lines underground cables.	a		
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11. Course Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 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	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

12. Learning and Teaching Resources

	Text
Required Texts	
Recommended Texts	
Websites	

Course Description Form

1. Course Name:	
Linear Systems Theory	
2. Course Code:	
EE303	
3. Semester / Year:	
5/2024	
4. Description Preparation Date:	
5. Available Attendance Forms:	
6. Number of Credit Hours (Total) / Number of Units (Total)	
ECTS Credits	6
SWL (hr/sem)	150
7. Course administrator's name (mention all, if more than one name)	
Name: Professor Fadhil R. Tahir	
Email:	
8. Course Objectives	
Course Objectives	The aim of this module is to develop a rigorous understanding of linear systems and their behavior in both time and frequency domains. It provides the theoretical foundation and analytical tools needed to model, analyze, and design linear time-invariant (LTI) systems, which are central to control systems, signal processing, and communications engineering. Specifically, the module aims to: 1. Introduce the mathematical representation of linear systems using differential equations, transfer functions, and state-space models. 2. Develop the ability to analyze the stability, controllability, and observability of dynamic systems. 3. Explore system response characteristics through time-domain and frequency-domain techniques. 4. Provide foundational knowledge for control system design and digital signal processing.

	5. Equip students with the skills to use software tools (e.g., MATLAB) for simulating and analyzing linear systems.
9. Teaching and Learning Strategies	
Strategy	1. Lectures with Active Learning Integration ○ Deliver core theoretical concepts using derivations, worked examples, and system diagrams. ○ Incorporate in-class questions, polling, and brief problem-solving to promote engagement. 2. Tutorial Sessions and Problem-Solving Workshops ○ Provide structured opportunities for students to practice analytical techniques (e.g., Laplace transforms, Bode plots). ○ Encourage group work and peer learning to solve complex, multi-step problems. 3. Laboratory and Simulation-Based Learning ○ Use MATLAB/Simulink to reinforce concepts such as state-space modeling, time/frequency response, and stability. ○ Provide hands-on experience with system simulation, model validation, and graphical analysis. 4. Blended Learning and Online Resources ○ Supplement in-person teaching with video lectures, animations, and interactive simulations. ○ Recommend platforms like MATLAB Online, MIT OpenCourseWare, or NPTEL for deeper exploration. 5. Problem-Based Learning (PBL) ○ Present real-world engineering scenarios (e.g., motor control, aircraft dynamics, circuit response) that require modeling and analysis. ○ Encourage students to identify suitable system representations and analytical methods. 6. Scaffolded Learning Progression ○ Build content progressively from basic to advanced topics (e.g., from transfer functions to state-space analysis). ○ Reinforce earlier material through cumulative examples and assessments. 7. Formative Feedback and Continuous Assessment ○ Use weekly quizzes, diagnostic tasks, and feedback sessions to monitor progress and clarify misconceptions. ○ Allow opportunities for self-assessment and reflection. 8. Capstone Mini-Project or Simulation Task (optional) ○ Allow students to apply modeling and analysis tools to a complete system (e.g., control system, RLC circuit). ○ Promote integration of theory, simulation, and reporting skills. 9. Office Hours and Peer Support ○ Offer structured time for one-on-one or small group support. ○ Encourage student-led study groups or forums for discussion.

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10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1			Introduction Linear Systems		
2			Mathematical Modeling		
3			Laplace Transfo Fundamentals Applications Laplace Transforms		
4			Time-Domain Analysis of L Systems		
5			Transfer Functio and Stability		
6			State-Space Representation		
7			Solution of Sta Equations		
8			System Stabili Analysis		
9					

10			Controllability and Observability		
11			Frequency Response Analysis – Bode Plots		
12			Frequency Response – Nyquist & Nichols		
13			System Realization and Model Reduction		
14			Simulation and Computational Tools		
15			Module Review and Exam Preparation		
			Preparatory work before the final Exam		

11. Course Evaluation

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

Summative assessment	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		
12. Learning and Teaching Resources					
			Text		
Required Texts			Linear System Theory and Design		
Recommended Texts			Modern control System		
Websites					

