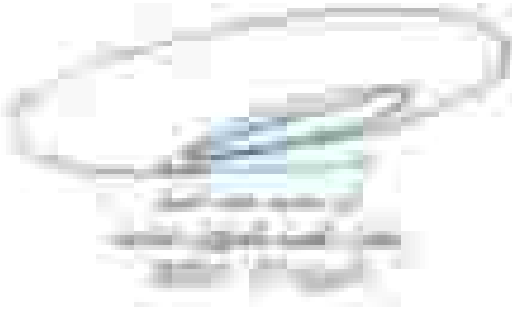




المملكة العربية السعودية
الجمهورية العربية السورية
الجمهورية الجزائرية الديمقراطية الشعبية

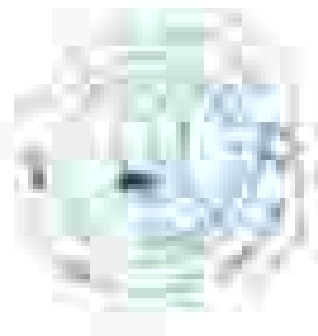
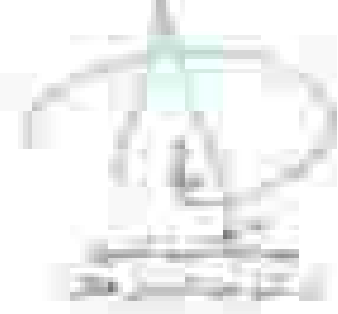
مجلس التعليم العالي والتعليم العالي والبحث العلمي

المجلس الأعلى للتعليم
والتعليم العالي والبحث العلمي
الجمهورية العربية السورية
الجمهورية الجزائرية الديمقراطية الشعبية



المملكة العربية السعودية
الجمهورية العربية السورية
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المجلس الأعلى للتعليم
والتعليم العالي والبحث العلمي
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الجمهورية العربية السورية
الجمهورية الجزائرية الديمقراطية الشعبية



1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities related to the business.

2. It then outlines the various methods and techniques used to collect and analyze data, including surveys, interviews, and focus groups.

3. The document also provides a detailed overview of the statistical tools and software used to process and interpret the data, such as SPSS and Excel.

4. Finally, it concludes with a summary of the key findings and recommendations based on the analysis.

5. The document is intended to serve as a comprehensive guide for anyone involved in data analysis and reporting.

Category	Item 1	Item 2	Item 3	Item 4
Group A	10	20	30	40
Group B	15	25	35	45
Group C	20	30	40	50
Group D	25	35	45	55
Group E	30	40	50	60
Group F	35	45	55	65
Group G	40	50	60	70
Group H	45	55	65	75
Group I	50	60	70	80
Group J	55	65	75	85

Category	Item 1	Item 2	Item 3	Item 4
Group A	10	20	30	40
Group B	15	25	35	45
Group C	20	30	40	50
Group D	25	35	45	55
Group E	30	40	50	60
Group F	35	45	55	65
Group G	40	50	60	70
Group H	45	55	65	75
Group I	50	60	70	80
Group J	55	65	75	85



日期	姓名	性别	年龄	职业	住址	联系电话	备注
2023-10-26	张三	男	35	教师	北京市朝阳区	13800138000	无异常
2023-10-27	李四	女	28	程序员	北京市海淀区	15000150000	无异常
2023-10-28	王五	男	45	医生	上海市浦东新区	18000180000	无异常
2023-10-29	赵六	女	30	护士	广州市天河区	13500135000	无异常
2023-10-30	孙七	男	22	学生	深圳市南山区	15900159000	无异常
2023-10-31	周八	女	38	工程师	武汉市武昌区	13600136000	无异常
2023-11-01	吴九	男	40	会计师	成都市高新区	18800188000	无异常
2023-11-02	郑十	女	25	设计师	南京市鼓楼区	15200152000	无异常
2023-11-03	冯十一	男	32	销售经理	杭州市西湖区	13700137000	无异常
2023-11-04	陈十二	女	27	产品经理	西安市雁塔区	15100151000	无异常
2023-11-05	林十三	男	33	运营专员	昆明市五华区	13900139000	无异常
2023-11-06	周十四	女	29	市场专员	长沙市岳麓区	15300153000	无异常
2023-11-07	吴十五	男	36	数据分析师	合肥市蜀山区	13400134000	无异常
2023-11-08	郑十六	女	24	客服专员	郑州市金水区	15800158000	无异常
2023-11-09	冯十七	男	31	培训师	海口市龙华区	13200132000	无异常
2023-11-10	陈十八	女	26	行政助理	贵阳市南明区	15600156000	无异常
2023-11-11	林十九	男	34	项目经理	海口市秀英区	13100131000	无异常
2023-11-12	周二十	女	23	实习生	海口市琼山区	15400154000	无异常
2023-11-13	吴二十一	男	37	财务总监	海口市美兰区	13000130000	无异常
2023-11-14	郑二十二	女	21	应届生	海口市龙华区	15700157000	无异常
2023-11-15	冯二十三	男	39	人力资源	海口市秀英区	13600136000	无异常
2023-11-16	陈二十四	女	28	法务专员	海口市琼山区	15500155000	无异常
2023-11-17	林二十五	男	35	产品经理	海口市美兰区	13300133000	无异常
2023-11-18	周二十六	女	25	运营专员	海口市琼山区	15200152000	无异常
2023-11-19	吴二十七	男	32	市场专员	海口市美兰区	13800138000	无异常
2023-11-20	郑二十八	女	27	数据分析师	海口市琼山区	15100151000	无异常
2023-11-21	冯二十九	男	30	客服专员	海口市美兰区	13900139000	无异常
2023-11-22	陈三十	女	29	培训师	海口市琼山区	15900159000	无异常
2023-11-23	林三十一	男	33	行政助理	海口市美兰区	13700137000	无异常
2023-11-24	周三十二	女	26	实习生	海口市琼山区	15600156000	无异常
2023-11-25	吴三十三	男	38	财务总监	海口市美兰区	13500135000	无异常
2023-11-26	郑三十四	女	22	应届生	海口市琼山区	15400154000	无异常
2023-11-27	冯三十五	男	40	人力资源	海口市美兰区	13200132000	无异常
2023-11-28	陈三十六	女	28	法务专员	海口市琼山区	15300153000	无异常
2023-11-29	林三十七	男	34	产品经理	海口市美兰区	13100131000	无异常
2023-11-30	周三十八	女	24	运营专员	海口市琼山区	15200152000	无异常
2023-12-01	吴三十九	男	31	市场专员	海口市美兰区	13800138000	无异常
2023-12-02	郑四十	女	27	数据分析师	海口市琼山区	15100151000	无异常
2023-12-03	冯四十一	男	30	客服专员	海口市美兰区	13900139000	无异常
2023-12-04	陈四十二	女	29	培训师	海口市琼山区	15900159000	无异常
2023-12-05	林四十三	男	33	行政助理	海口市美兰区	13700137000	无异常
2023-12-06	周四十四	女	26	实习生	海口市琼山区	15600156000	无异常
2023-12-07	吴四十五	男	37	财务总监	海口市美兰区	13500135000	无异常
2023-12-08	郑四十六	女	21	应届生	海口市琼山区	15400154000	无异常
2023-12-09	冯四十七	男	39	人力资源	海口市美兰区	13200132000	无异常
2023-12-10	陈四十八	女	28	法务专员	海口市琼山区	15300153000	无异常
2023-12-11	林四十九	男	35	产品经理	海口市美兰区	13100131000	无异常
2023-12-12	周五十	女	25	运营专员	海口市琼山区	15200152000	无异常
2023-12-13	吴五十一	男	32	市场专员	海口市美兰区	13800138000	无异常
2023-12-14	郑五十二	女	27	数据分析师	海口市琼山区	15100151000	无异常
2023-12-15	冯五十三	男	30	客服专员	海口市美兰区	13900139000	无异常
2023-12-16	陈五十四	女	29	培训师	海口市琼山区	15900159000	无异常
2023-12-17	林五十五	男	33	行政助理	海口市美兰区	13700137000	无异常
2023-12-18	周五十六	女	26	实习生	海口市琼山区	15600156000	无异常
2023-12-19	吴五十七	男	38	财务总监	海口市美兰区	13500135000	无异常
2023-12-20	郑五十八	女	22	应届生	海口市琼山区	15400154000	无异常
2023-12-21	冯五十九	男	40	人力资源	海口市美兰区	13200132000	无异常
2023-12-22	陈六十	女	28	法务专员	海口市琼山区	15300153000	无异常
2023-12-23	林六十一	男	34	产品经理	海口市美兰区	13100131000	无异常
2023-12-24	周六十二	女	24	运营专员	海口市琼山区	15200152000	无异常
2023-12-25	吴六十三	男	31	市场专员	海口市美兰区	13800138000	无异常
2023-12-26	郑六十四	女	27	数据分析师	海口市琼山区	15100151000	无异常
2023-12-27	冯六十五	男	30	客服专员	海口市美兰区	13900139000	无异常
2023-12-28	陈六十六	女	29	培训师	海口市琼山区	15900159000	无异常
2023-12-29	林六十七	男	33	行政助理	海口市美兰区	13700137000	无异常
2023-12-30	周六十八	女	26	实习生	海口市琼山区	15600156000	无异常
2023-12-31	吴六十九	男	37	财务总监	海口市美兰区	13500135000	无异常



The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for ensuring the integrity and reliability of financial data. This section also outlines the various methods and tools used to collect and analyze data, highlighting the need for consistency and precision in all reporting.

The second part of the document provides a detailed overview of the data collection process. It describes the various sources of data, including internal systems, external databases, and manual input. The text also discusses the challenges associated with data collection, such as data quality, completeness, and timeliness. To address these challenges, the document proposes several strategies and best practices, including regular data audits, data validation, and the use of data cleaning techniques.

The third part of the document focuses on data analysis and reporting. It discusses the various analytical techniques used to extract insights from the collected data, such as descriptive statistics, regression analysis, and data visualization. The text also emphasizes the importance of clear and concise reporting, ensuring that the findings are presented in a way that is easy to understand and actionable.

The final part of the document provides a summary of the key findings and conclusions. It reiterates the importance of data-driven decision-making and the need for continuous improvement in data management practices. The document also includes a list of references and a glossary of key terms.

Data Source		Data Type		Data Frequency	
Internal System	Transaction Data	Continuous	Real-time	Hourly	Monthly
External Database	Market Data	Discrete	Real-time	Hourly	Quarterly
Manual Input	Survey Data	Discrete	Batch	Weekly	Annually
Internal System	Log Data	Continuous	Real-time	Hourly	Monthly
External Database	Financial Data	Discrete	Real-time	Hourly	Quarterly
Manual Input	Customer Feedback	Discrete	Batch	Weekly	Annually



Year	2010	2011	2012	2013	2014	2015
Revenue	100	105	110	115	120	125
Expenses	80	85	90	95	100	105
Profit	20	20	20	20	20	20

The following table shows the financial performance of the company from 2010 to 2015. The revenue has increased steadily over the period, while expenses have also increased but at a slower rate than revenue. This has resulted in a consistent profit of 20 units per year.

The revenue growth is primarily driven by an increase in sales volume, while the expense growth is mainly due to higher operating costs. The stable profit margin indicates that the company is effectively managing its costs relative to its revenue.

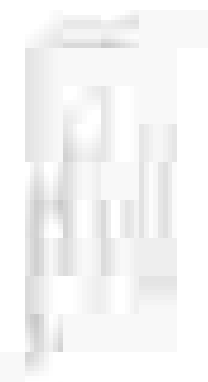
Overall, the company's financial performance is positive, showing a clear upward trend in both revenue and profit over the six-year period.



Year	Number of cases	Percentage of total cases
2000	100	100%
2001	100	100%
2002	100	100%
2003	100	100%
2004	100	100%
2005	100	100%
2006	100	100%
2007	100	100%
2008	100	100%
2009	100	100%
2010	100	100%
2011	100	100%
2012	100	100%
2013	100	100%
2014	100	100%
2015	100	100%
2016	100	100%
2017	100	100%
2018	100	100%
2019	100	100%
2020	100	100%
2021	100	100%
2022	100	100%
2023	100	100%
2024	100	100%
2025	100	100%
2026	100	100%
2027	100	100%
2028	100	100%
2029	100	100%
2030	100	100%



Date		Time		Location		Weather		Observations	
1911	10/10	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/11	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/12	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/13	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/14	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/15	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/16	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/17	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/18	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/19	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/20	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/21	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
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1911	10/26	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/27	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/28	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/29	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/30	08:00	09:00	1000	1000	Cloudy	1000	1000	1000
1911	10/31	08:00	09:00	1000	1000	Cloudy	1000	1000	1000



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Physics	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ENG001		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UG1		
Administering Department	Electrical	College	College of Engineering
Module Leader	Ehsan H. Sabbar	e-mail	Ehsan.sabbar@uoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/Oct/2023	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	<ol style="list-style-type: none"> 1. Introduce fundamental concepts in physics. 2. Develop mathematical skills for problem-solving. 3. Cover mechanics, oscillations, and waves. 4. Introduce thermodynamics and fluid mechanics. 5. Explore electric and magnetic fields. 6. Cover basic principles of optics. 7. Develop practical laboratory skills. 8. Apply physics principles to engineering contexts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Understand fundamental physics concepts. 2. Apply mathematics to solve physics problems. 3. Analyze motion, forces, and energy in engineering contexts. 4. Interpret oscillations and waves in engineering applications. 5. Apply thermodynamics and fluid mechanics to engineering problems. 6. Apply electric and magnetic field principles in engineering scenarios. 7. Explain optical phenomena and apply basic optics principles. 8. Conduct experiments, analyze data, and communicate findings. 9. Apply physics principles to address engineering challenges. 10. Make informed engineering decisions using physics knowledge.
Indicative Contents المحتويات الإرشادية	<ol style="list-style-type: none"> 1. Introduction to Physics and Measurement. 2. Mechanics: Motion, Forces, and Energy. 3. Oscillations and Waves. 4. Thermodynamics. 5. Fluid Mechanics. 6. Electric and Magnetic Fields. 7. Optics. 8. Laboratory Sessions. 9. Engineering Applications.

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

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3

Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125
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Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	LO#1, 2, 3
	Assignments	2	5% (5)	2, 12	LO#1, 2
	Projects / Lab.	1	10% (10)		LO#1, 9,7
	Report	1			LO#1, 2,5
Summative assessment	Midterm Exam	2hr	15% (15)	8	
	Final Exam	3hr	60% (60)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Physics and measurement; Kinematics of motion of a single particle in one and two dimensions; Kinematics of projectile and circular motion.
Week 2	Dynamics of motion of a single particle and multiple objects in one and two dimensions and Newton's Laws; Free body diagrams; various types of mechanical forces; Application on the use of Newton's Laws
Week 3	Work and energy; Conservative systems and the concept of potential energy; Conservation of mechanical energy
Week 4	System of particles; Linear momentum; Conservation of linear momentum and collisions; Elastic and Inelastic collisions; Center of mass.
Week 5	Kinematics and Dynamics of rotational motion; Torque; Moment of inertia; Angular momentum; Static equilibrium of rigid bodies; Elasticity and concepts of stress and strain
Week 6	Phases of matter; Pressure and density, Equations of Fluid static; Equations of fluid dynamics: Continuity and Bernoulli's equations.
Week 7	Oscillating systems; Simple Harmonic Motion (SHM); Energy of SHM; Damped oscillations; Forced oscillations and Resonance.
Week 8	Midterm Exam
Week 9	Types of waves: Transverse and Longitudinal; Traveling waves; Wave speed; The wave equation; Power and intensity in wave motion;
Week 10	Examples & Problems
Week 11	Reflection and transmission of wave; The principle of superposition; Interference of waves; Standing waves; Resonance
Week 12	Macroscopic and microscopic description of matter;
Week 13	Measuring temperature; Thermal expansion.
Week 14	Concept of temperature and thermal equilibrium (zeroth law of thermodynamics)
Week 15	Measuring temperature; Thermal expansion.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Measurements and Data Analysis
Week 1	LAB1: Analyzing the kinematic components of 1D motion by using motion sensor
Week 2	LAB2: Determination of the Acceleration of Gravity by studying Free fall
Week 3	LAB3: Verification of Newton's Second Law
Week 4	LAB4: Frequency Modulation
Week 5	LAB5: Conservation of mechanical energy
Week 6	LAB6: Verification of Work – energy theorem
Week 7	LAB7: Static Equilibrium of a rigid object
Week 8	LAB8: Determination of the Acceleration of Gravity using the Simple Pendulum

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• R.D. Knight, Physics for Scientists and Engineers, 2nd ed., Pearson 2008 Laboratory Manual, Compiled by Instructor	No
Recommended Texts	<i>University Physics</i> , William Moebis, Formerly of Loyola Marymount University Samuel J. Ling, Truman State University Jeff Sanny, Loyola Marymount University	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Calculus I	Module Delivery	
Module Type	B	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ENG003		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	1
Administering Department	Electrical	College	College of Engineering
Module Leader	Yasameen Kamil Najm	e-mail	yknajm@uoanbar.edu.iq
Module Leader's Acad. Title	Lecture	Module Leader's Qualification	MSc.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	24/09/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	<ol style="list-style-type: none">1. This course aims to provide the student with the skill of dealing with mathematical equations, clarifying the concept of differentiation and integration, and the polar, Cartesian, and cylindrical coordinates.2. Demonstrate methods for solving integrals and sequences and series.3. The course aims to study the applications of integration in calculating the lengths of curves, areas, and volumes in different coordinates and some physical applications.4. The course aims to give the student a new background that he can benefit from when studying differential equations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. To develop mathematical skill so that students are able to sketch the graph of various functions and evaluate Limits by using different techniques including L'Hopital's Rule.2. Apply mathematical methods and principles in solving various derivative problems from Engineering fields, involving applications of derivatives.3. Demonstrate algebraic facility with algebraic topics including linear, quadratic, exponential, logarithmic, and trigonometric functions,4. Compute derivative and anti-derivative of algebraic, trigonometric, inverse trigonometric, exponential, logarithmic, and apply them to solve problems in a wide range of engineering applications.
Indicative Contents المحتويات الإرشادية	<p>Indicative content includes the following.</p> <ol style="list-style-type: none">1. Functions2. Limits3. Differentiation rules4. The Chain Rule, implicit Differentiation5. Applications of differentiation6. Exponential and logarithmic functions.7. Trigonometric functions and their derivatives8. Hyperbolic functions and their derivatives9. Advanced Applications of differentiation10. Derivative and anti-derivative functions

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.</p>
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25% (25)	5, 10	LO#1, 2 and 3
	Assignments	2	10% (10)	2, 12	LO#1, and 4
	Projects / Lab.				
	Report	1	5%	13	LO#4
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO#1,2 and 3
	Final Exam	3hr	50% (50)	16	LO#1,2,3 and 4
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Functions
Week 2	Functions
Week 3	Limits
Week 4	Limits
Week 5	Differentiation rules
Week 6	Differentiation rules
Week 7	The Chain Rule, implicit Differentiation
Week 8	Applications of differentiation
Week 9	Applications of differentiation
Week 10	Exponential and logarithmic functions

Week 11	Trigonometric functions and their derivatives
Week 12	Hyperbolic functions and their derivatives
Week 13	Advanced Applications of differentiation
Week 14	Derivative and anti-derivative functions
Week 15	Derivative and anti-derivative functions
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Stewart, J., Clegg, D. K., & Watson, S. (2020). Calculus: early transcendental. Cengage Learning	
Recommended Texts	Thomas, G. B., Haas, J., Heil, C., & Weir, M. (2018). Thomas' Calculus. Pearson Education Limited. Stroud, K. A., & Booth, D. J. (2020). Engineering mathematics. Bloomsbury Publishing.	
Websites		

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Engineering Drawing	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ENG007		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	1
Administering Department	Electrical	College	College of Engineering
Module Leader	Zainab najeeb	e-mail	@uoanbar.edu.iq
Module Leader's Acad. Title	Mr.	Module Leader's Qualification	Ms.C
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/nov/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course discusses the basic concepts of engineering drawings. It also provides an introduction to the AutoCAD software and covers
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Define and interface of designing. 2. Define and interface of AutoCAD. 3. Draw with aide of AutoCAD .
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> ● Make the student able to draw and complete designs for electrical works8. Describe the principles of 10. ● Giving exercises related to the topic and various electrical works. ● Define and interface of designing. ● Define and interface of AutoCAD. ● Draw with aide of AutoCAD .

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

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	92	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	58	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	LO#1,2 and 3
	Assignments	2	5% (5)	2, 12	LO#2, 3
	Projects / Lab.	1	10% (10)		LO# 3
	Report	1			LO# 3
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO# 2 and 3
	Final Exam	3hr	60% (60)	16	LO#1,2 and 3
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Starting AutoCAD, Units
Week 2	, Units, features overview
Week 3	AutoCAD basics, commands
Week 4	commands, the status bar
Week 5	coordinate system, and zooming
Week 6	Layers: creation, properties
Week 7	management, setting line weights.
Week 8	Objects commands. program help
Week 9	point, line, dimensions, circle
Week 10	rectangle, arc, ellipse, polygon
Week 11	donut, hatch, construction line, poly line, text.
Week 12	Modify commands. erase, copy,
Week 13	copy, move, offset, mirror, trim, extend
Week 14	break, rotate, scale, lengthen, stretch, fillet, chamfer, array, explode
Week 15	Examples of electrical project.
Week 16	Final Exam

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

Required Texts	Autodesk, "AutoCAD 2015: Complete Guide to What's New", 2015	No
Recommended Texts	.	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Fundamentals of Electrical Engineering I		Module Delivery
Module Type	C		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ENG005		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UG1	Semester of Delivery	
Administering Department	Electrical	College	College of Engineering
Module Leader	thaker Mahmood Nayl	e-mail	thaker.nayl@uoanbar.edu.iq
Module Leader's Acad. Title	Assist. Prof	Module Leader's Qualification	PhD
Module Tutor	Sameh Jassam Mohammed	e-mail	samehjassam@uoanbar.edu.iq
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/nov/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	<ol style="list-style-type: none"> 1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current
Indicative Contents المحتويات الإرشادية	DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, 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.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	73	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	LO#1,2,3,7,9 and 11
	Assignments	2	5% (5)	2, 12	LO#2,5 and 8
	Projects / Lab.	1	10% (10)		LO#2,5 and 8
	Report	1			LO#10 and 11
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO#1to 9
	Final Exam	3hr	60% (60)	16	LO#2,to 11
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction - Difference between Circuit Theory and Field Theory
Week 2	Basics of Network Elements
Week 3	Charge, Current and Voltage
Week 4	Power and Energy
Week 5	Resistance and Resistivity and Ohm's Law
Week 6	Kirchhoff's Laws
Week 7	Series Resistors and Voltage Division
Week 8	Parallel Resistors and Current Division
Week 9	Midterm Exam 1
Week 10	Wye-Delta Transformations
Week 11	Circuit Analysis - Nodal and Mesh
Week 12	Linearity and Superposition
Week 13	Source Transformations
Week 14	Thévenin and Norton Equivalentents
Week 15	Maximum Power Transfer
Week 16	Midterm Exam 2

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	Lab 1: Equipment Familiarization
Week 2	Lab 2: Ohm's Law

Week 3	Lab 3: Kirchhoff's Laws
Week 4	Lab 4: Series Resistors and Voltage Division
Week 5	Lab 5: Parallel Resistors and Current Division
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Human Rights & Democracy		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA005		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	1	Semester of Delivery	
Administering Department		College	
Module Leader	Muanna w naji	e-mail	muanna.naji@uoanbar.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/11/2025	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims أهداف المادة الدراسية</p>	<p>This course is designed to give the student a definition of human rights and democracy idiomatically, the legitimacy of the origin of the right in the view of Islamic law, the pillars of the right and its types, personal freedom, intellectual freedom, economic rights and freedoms, Islam and slavery, the goals of human rights, the use of freedom and the general legitimate right, the right of a Muslim to His Muslim brother, the rights of parents, the right neighbor, the right of women, human rights in the divine religions, religious tolerance in Islam.</p> <p>thinking skills</p> <ol style="list-style-type: none"> 1. Work on developing the intellectual property of the student. 2. Ensuring the student's personal development at the academic level. 3. Drawing ways of intellectual success to achieve personality building on the (family, social, academic, and professional) levels. 4. Learn the art of dealing with the above character building levels.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. 1. Explain the concept of "human rights and democracy" 2. 2. The status of human rights and freedoms in Islam 3. 3. Define and describe the relationship between human rights and democracy
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Course Topics:</p> <ol style="list-style-type: none"> 1. Introducing human rights, democracy and the principle of freedoms. [Two hours] 2. The origin of right and freedom from the point of view of Islamic law, and the general concept. [3 hours] 3. Elements and types of human rights and freedoms. [8 hours] 4. Economic and political rights and freedoms. [3 hours] 5. Islam and slavery. [1 hour] 6. The objectives of human rights and democracy. [4 hours] 7. The project of using freedom and public right. [2 hours] 8. The right of a Muslim and humanity. [2 hours]

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	32	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	2
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Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	18	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Raise the intellectual level of students, which is the importance of human rights when it is reflected on the individual, society and the state
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Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3, 10	LO #1
	Assignments	0			
	Projects / Lab.	0			
	Report	2	10% (10)	13	LO 1,2 and 13
Summative assessment	Midterm Exam	2 hr	20% (20)	7	LO # 1-3
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	The Universal Declaration of Human Rights and other countries speak of human rights over the individual, society and the state. Clarifying the meaning of right, duty, responsibility and guarantees of human rights before the judiciary.

Week 2	Sections of human rights in law and Sharia, statement of the rights of God Almighty and guarantees of human rights. It includes sections of the rights of the individual over society such as the right to protect life, honor and mind, and the right to protect money and property.
Week 3	The right to equality before the law and the right to equality and justice among individuals. The right of the individual to work, learn, express his opinion and freedom of thought.
Week 4	Clauses of preserving the freedoms contained in the Universal Declaration of Human Rights, and the impact of the study. Explanation of the meaning of freedom and democracy and the types and divisions of freedoms.
Week 5	Freedoms related to the material rights of an individual, including personal freedom. Freedoms related to the material rights of an individual, including civil liberties.
Week 6	Freedom of movement, residence and ownership. Freedoms related to the moral rights of the individual.
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit.
Week 8	Statement of the sanctity of the home and the right of the individual to move. The rights of society over the individual include the right to freedom of belief and life, the right to honor protection, work and education.
Week 9	Ensuring equality before the law and the judiciary, freedom of opinion and thought, and protection of the mind The right to protection of property and travel.
Week 10	The rights of the individual over the individual, including social rights. Financial rights and its importance in ensuring social life.
Week 11	Finally, emphasizing the importance of commitment to applying human rights and their impact on the individual, society and the state.
Week 12	Freedom of belief, freedom of opinion and expression, and freedom of education. Political freedom, the culture of dialogue and its impact on proving freedom of opinion.
Week 13	One of the heroes of enslaving people and proving freedom for individuals. Highlighting the freedom of women and beautifying them in adhering to the teachings of faith and proving the importance of applying the principle of freedoms among individuals.
Week 14	Individual and international interest in applying the principle of freedoms. Rights and freedoms are two interrelated principles. The role of the individual, society and the state in establishing the principle of human rights and freedoms. And a statement of the negatives in the event of non-application of the principle of freedoms.
Week 15	Iraq and international treaties in the field of human rights and Iraq's position in eliminating dictatorship and racism and work to preserve public rights and public money and eliminate financial and administrative corruption.
Week 16	Preparatory week before the final Exam.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	

Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Lectures on human rights, freedoms and democracy	Yes
Recommended Texts	<ol style="list-style-type: none"> Human rights and freedoms. Prof. Dr. Mustafa Al-Zalmi. Some contemporary published research involving human rights and books on the Universal Declaration of Human Rights 	Yes
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Genral Chemistry		Module Delivery
Module Type	Support		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ENG002		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level		Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Mohammad Jasem	e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Dr. Hamad Khalifa	e-mail	habdulkadir56@uoanbar.edu.iq
Scientific Committee Approval Date	01/11/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Objectives أهداف المادة الدراسية</p>	<p>The goals of this course are to enable students to:</p> <ol style="list-style-type: none">1. Scientific reasoning and quantitative analysis. Our majors will be able to apply chemical concepts to solve qualitative and quantitative problems.2. Laboratory practice and safety. In order to learn the ways in which new scientific knowledge is created, our majors will experience how chemists interpret chemical and physical phenomena through experimental investigation. They will develop and apply the appropriate lab skills and instrumentation to solve chemical problems.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>By the end of successful completion of this course, the student will be able to:</p> <ol style="list-style-type: none">1. Define the structure of atoms in terms of the nucleus with protons, neutrons, & electrons.2. Write and balance chemical equations, name inorganic compounds and ions and describe the properties of the main group elements.3. Carry out chemical calculations, including mass relations in chemical reactions, limiting reagent & reaction yield calculations, and calculations of reactions taking place in solution.4. Understand the concept of oxidation-reduction, calculate oxidation numbers, and balance redox reactions.5. Apply the ideal gas law in solving problems involving the gas phase6. Solve problems in chemical thermodynamics and calorimetry.7. Predict the electronic structure of atoms and ions from quantum theory, and) relate the position of an element in the periodic table to its electronic structure and to the physical and chemical properties of the elements.8. Describe the principles of chemical bonding and write Lewis structures.9. Predict the geometry of the electron pairs and the shape of molecules using VSEPR theory, predict bond polarity and molecular dipoles.10. Describe the valence bond theory, predict the hybridization of atoms in molecules, and describe bonding in molecules with single, double and triple bonds in terms of and π bonds, and delocalized molecular orbitals.

Indicative Contents

المحتويات الإرشادية

Indicative content includes the following.

Part A:

1- Handling Numbers. Dimensional Analysis in Solving Problems Recognize chemical safety and hazardous materials icons

2- Atomic Number. Mass Number. and isotopes. The Periodic Table. Molecules and Ions. Describe laboratory instruments and some basic techniques used in the chemistry laboratory, including balances and standard volumetric equipment

3- Chemical Formulas. Naming Compounds. Atomic Mass. Avogadro's number and Molar Mass of an Element.

4- Chemical Reactions and Chemical Equations.

5- Describe how to Prepare accurate laboratory reports of their experimental results; Amounts of Reactants and Products; limiting Reagent Calculations; Reaction Yield; General Properties of Aqueous Solutions. Precipitation Reactions. Acid-Base Reactions; Oxidation-Reduction Reactions; Concentration of Solutions.

6- Acid-Base Titrations, Cases Pressure.

7- The ideal Gas Equation; Gas Stoichiometry; Partial Pressures; The Nature of Energy and types of energy

8- Energy Changes in Chemical Reactions; introduction to Thermodynamics. Enthalpy of Chemical Reactions; Calorimetry;

9- Standard Enthalpy of Formation and Reaction From Classical Physics to Quantum Theory; Bohr's Theory of the Hydrogen Atom; Quantum Numbers; Atomic Orbitals Electron Configuration;

10- Development of the Periodic Table; Periodic Classification of the Elements; Periodic Variation in Physical Properties;

Ionization Energy; Electron Affinity Lewis Dot Symbols; The ionic Bond; The Covalent Bond; Electro negativity; Writing Lewis structure Formal Charge and Lewis Structures.

11- The Concept of Resonance. Exceptions to the Octet Rule Bond Energy

12- Molecular Geometry; Dipole Moment; Spectrophotometric Analysis of tetracycline; Valence Bond Theory.

Hybridization of Atomic Orbital's. Hybridization in Molecules Containing Double and Triple Bonds. Delocalized Molecular Orbital's

Part B:

1- Types of analysis in analytical chemistry and their uses. Units for expressing concentration.

2- preparing solutions, standard solution, amounts of reactants and products.

3- Chemical equilibrium and reversible reactions, thermodynamics & chemical equilibrium

4- Equilibrium constants for chemical reactions.

5- Describe how to Prepare accurate laboratory reports of their experimental results

6- Equilibrium constants for chemical reactions

7- Electrochemistry, relationship between cell potential and the equilibrium constants relationship between ΔG , K , and E_{0cell} . the Nernst equation.

8- Volumetric analysis their uses and classification, titrimetric analysis calculations.

9- Acid-base titration

	<u>10- Precipitation titration</u> <u>11- Complexometric titration</u> <u>12- Oxidation-reduction titration</u> <u>13- Gravimetric analysis.</u> <u>14- Introduction and applications of industrial analysis method.</u>
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3 and 10	LO #1, #2 and #3, #4
	Assignments	1	10% (10)	2 and 12	LO #5, #6
	Projects / Lab.	1	10% (10)	Continuous	LO #1, #2 and #3, #4
	Report	0	0 % (0)	-	-

Summative assessment	Midterm Exam	2hr	20% (20)	7	LO #1, #2 and #3, #4, #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	MEASUREMENTS IN CHEMISTRY
Week 2	Problem Solving in Chemistry - Dimensional Analysis
Week 3	Atoms, Molecules and Ions
Week 4	Mass Relationships in Chemical Reactions
Week 5	Reactions in Aqueous Solutions
Week 6	Gasses
Week 7	Thermochemistry
Week 8	Quantum Theory and the Electronic Structure of Atoms
Week 9	Chemical Bonding
Week 10	Electrochemistry
Week 11	Volumetric Methods of Analysis
Week 12	Titration Based on Acid-Base Reactions
Week 13	Titration Based on Precipitation Reactions
Week 14	Titration Based on Complexation Reactions
Week 15	Titration Based on Redox reactions
Week 16	Gravimetric Methods of Analysis

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1:
Week 2	Lab 2:
Week 3	Lab 3:
Week 4	Lab 4:
Week 5	Lab 5:

Week 6	Lab 6:
Week 7	Lab 7:

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Introductory Chemistry Essentials, Nivaldo J. Tro	
Recommended Texts	Chemistry. Steven S. Zumdahl, Susan A. Zumdahl, Donald J. DeCoste	
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Arabic Language1		Module Delivery
Module Type	S		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA001		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UG1	Semester of Delivery	
Administering Department	Electrical Engineering	College	Engineering
Module Leader	Muanna W Naji	e-mail	muanna.naji@uoanbar.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	02/10/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<p>This course aims to build students' knowledge and competence in the Arabic language, rhetoric, and Arabic literature of all kinds, to increase their ability to appreciate literature and develop their awareness of its concepts through the study of poetry, novels, and short stories. story.</p> <p>C- thinking skills:</p> <ol style="list-style-type: none"> 1. Work on developing the intellectual property of the student. 2. Ensuring the personal development of the student at the academic level.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. Develop academic essay writing proficiency 2. Apply reading skills 3. Expand academic vocabulary through reading 4. Improve critical thinking skills 5. Developing the student's intellectual property in the field of the Arabic language, to acquire verbal and actual ability and skill.

Student Workload (SWL)

الحمل الدراسي للطالب

<p>Structured SWL (h/sem)</p> <p>الحمل الدراسي المنتظم للطالب خلال الفصل</p>	<p>32</p>	<p>Structured SWL (h/w)</p> <p>الحمل الدراسي المنتظم للطالب أسبوعياً</p>	<p>2</p>
<p>Unstructured SWL (h/sem)</p> <p>الحمل الدراسي غير المنتظم للطالب خلال الفصل</p>	<p>18</p>	<p>Unstructured SWL (h/w)</p> <p>الحمل الدراسي غير المنتظم للطالب أسبوعياً</p>	<p>1</p>
<p>Total SWL (h/sem)</p> <p>الحمل الدراسي الكلي للطالب خلال الفصل</p>	<p>50</p>		

<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	
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Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25% (25)	3,7, 10	LO #4, 6, 8 and 10
	Assignments	2	5% (6)	7	LO # 2
	Projects / Lab.	0			
	Report	1	10% (10)	13	LO # 5, 7 and 13
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	❖ From Surah Al-Baqarah, verses (260-263) From Surah Al-Hajj, verses (1-5).
Week 2	❖ From the noble Prophetic hadith: The Messenger of Allah, peace and blessings be upon him and his family, said: "I was sent only to perfect noble character". From the noble Prophetic hadith: The Messenger of Allah, peace and blessings be upon him and his family, said: "The best of you are those who learn the Qur'an and teach it."
Week 3	❖ Poetic selections in the pre-Islamic era: The Mu'allaqāt as a choice. Seven verses from Ibn al-Rūmī's Bā'iyya:
Week 4	❖ Human values in pre-Islamic poetry . Islam and poetry.
Week 5	❖ The morphological balance. Plurals in Arabic.
Week 6	❖ Assigning the verb to pronouns .

	Conjugation of verbs in terms of: soundness and weakness, simplicity and augmentation, and derivatives.
Week 7	Mid-term Exam + Unit-Step Forcing, Forced Response, the RLC Circuit
Week 8	Rules for writing the hamza (initial, medial, and final positions, and the hamzat al-wasl and al-qat').
Week 9	❖ Rules for writing punctuation marks . The alphabet letters (sun letters and moon letters).
Week 10	❖ Parts of Speech and Their Inflectional Markers (or Signs of Grammatical Ending.) Inflected (Mu'rab) and Uninflected (Mabni) / Definite (Ma'rifa) and Indefinite (Nakira).
Week 11	❖ The requested Arabic phrase translates to: ❖ Incomplete Verbs (Nawāsikh). The Subject (Fā'il) and Its Deputy (Nā'ib 'anhu) / The Vice Subject.
Week 12	❖ A general introduction to rhetoric: its linguistic and terminological definition, the sciences of rhetoric, and its relationship to language. ❖ Rhetoric: Simile: its definition, types, and applications.
Week 13	❖ Truth and Metaphor. ❖ Linguistic Metaphor: Definition, Relationships, and Applications. Metaphor: Definition, Types, and Applications.
Week 14	❖ Metaphor: Definition, Relationships, and Applications. ❖ Metaphor: Definition, Types, and Applications. Common Grammar Mistakes.
Week 15	Common language errors
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Lectures in the Arabic language.	Yes
Recommended Texts	Meanings of grammar / Prof. Dr. Fadel Al-Samarrai	No
Websites		

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Calculus II	Module Delivery	
Module Type	B	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ENG004		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	1	Semester of Delivery	2
Administering Department	Electrical	College	College of Engineering
Module Leader	Yasameen Kamil Najm	e-mail	yknajm@uoanbar.edu.iq
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	MSc.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	24/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG003	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	<ol style="list-style-type: none">1. This course aims to provide the student with the skill of dealing with mathematical equations, clarifying the concept of differentiation and integration, and the polar, Cartesian, and cylindrical coordinates.2. Demonstrate methods for solving integrals and sequences and series.3. The course aims to study the applications of integration in calculating the lengths of curves, areas, and volumes in different coordinates and some physical applications.4. The course aims to give the student a new background that he can benefit from when studying differential equations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. Evaluate definite, indefinite, and improper integrals by using different integration techniques.2. To determine arc length, surface area and volume by using the applications of integration techniques.3. Define polar coordinate graphs and solve related problems including area, arc length and volume.4. Identify the properties of sequences and their limits with identifying standard convergent operations of power series.
Indicative Contents المحتويات الإرشادية	<p>Indicative content includes the following.</p> <ol style="list-style-type: none">1. Principles of Integration2. Integral Methods3. Integration Techniques-Integration by Parts4. Integration Techniques-Trigonometric Integrals5. Integration Techniques-Partial Fractions.6. Applications of Integrals-Infinite Integral Areas7. Applications of Integrals-Arc Length, Surface area8. Applications of Integrals-Volumes (Disk, Washer, Shell)9. Polar Coordinates - Common Polar Coordinate Graphs10. Polar Coordinates - Tangents with Polar Coordinates, Curves defined by parametric equations.11. Sequences and Series

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some</p>
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	sampling activities that are interesting to the students.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25% (25)	2,4,6, 10, 12	LO# 1, LO# 2 and LO# 4
	Assignments	2	10% (10)	5, 13	LO# 2 and LO# 4
	Projects / Lab.				
	Report		5%(5)		
Summative assessment	Midterm Exam	1hr	10% (10)	7	LO# 1 and LO# 2
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Principles of Integration
Week 2	Integral Methods
Week 3	Integration Techniques-Integration by Parts
Week 4	Integration Techniques-Trigonometric Integrals

Week 5	Integration Techniques-Partial Fractions.
Week 6	Integration Techniques-Partial Fractions
Week 7	Applications of Integrals-Infinite Integral Areas
Week 8	Applications of Integrals-Arc Length, Surface area
Week 9	Applications of Integrals-Volumes (Disk, Washer, Shell)
Week 10	Polar Coordinates - Common Polar Coordinate Graphs
Week 11	Polar Coordinates - Tangents with Polar Coordinates, Curves defined by parametric equations.
Week 12	Polar Coordinates - Tangents with Polar Coordinates, Curves defined by parametric equations.
Week 13	Sequences and Series
Week 14	Sequences and Series
Week 15	Sequences and Series
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Stewart, J., Clegg, D. K., & Watson, S. (2020). Calculus: early transcendental. Cengage Learning	
Recommended Texts	Thomas, G. B., Haas, J., Heil, C., & Weir, M. (2018). Thomas' Calculus. Pearson Education Limited.	

	Stroud, K. A., & Booth, D. J. (2020). Engineering mathematics. Bloomsbury Publishing.	
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer Science I		Module Delivery
Module Type	Related		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA007		
ECTS Credits	3		
SWL (hr/sem)	100		
Module Level	UG2	Semester of Delivery	2
Administering Department	Electrical	College	College of Engineering
Module Leader	Ahmed Jamal Ahmed		e-mail Ahmed.j.ahmed@uoanbar.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	10/01/2026	Version Number	2.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	1-Utilize the computer for fundamental tasks. 2-Identify and discuss the hardware components of the computer system. 3-creating documents using word processor and creating presentation. 4-Conducting research on the internet. 5-An introduction to Artificial Intelligence.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Introduction to computers, computer components, concepts of hardware and software. 2. Operating System and Graphical user interface. 3. Introduction to Word, spread sheet, text creation and manipulation. 4. Create Presentation, Presentation slides. 5. Introduction to Internet and Web Browsers, computer networks, internet and its applications, world wide web. 6. Communication and Emails, getting email accounts, sent mail. 7. Identifying and solving common hardware and software.
Indicative Contents المحتويات الإرشادية	- Introduction of Computers - Operating system - Internet and web browsers

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25% (25)	3,5,9, 11,13	LO #1, 2, 10 and 11
	Assignments	2	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.		6% (4)	Continuous	
	Activities		4% (6)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction to computers: concepts of hardware and software with their components, concept of computing data and information. application of information electronics and communication technology
Week 2	Computer components: computer portions, hardware parts, I/O units, Memory types.
Week 3	Basic CPU Component, Computers ports, personal computer
Week 4	Operating System and Graphical User Interface GUI, operating system; Basics of common operating system, the user interface
Week 5	Use of common icons, using mouse techniques, Status Bar, using menu and menu-selection, concept of folder and directions, opening and closing different windows, create short cuts.
Week 6	Word processing: word processing basics, opening and closing of documents, text creation and manipulation.
Week 7	Mid – term Exam

Week 8	Formatting of text, table handling, spell check, language setting and thesaurus, printing of word document.
Week 9	Spread sheets: Basics of spreadsheet, manipulation of cells
Week 10	Formulas and functions, editing of spread sheet, printing of spread sheet.
Week 11	Presentation of Software: Basics of presentation software; Creating presentation.
Week 12	Preparation and presentation of slides; slide show; taking printouts of presentation/ handouts.
Week 13	Introduction of internet and web browsers: Computer network basic; LAN, WAN; concept of internet and its applications; connecting to internet world wide web; browsing software's, search engines; understanding URL; domain name; IP address.
Week 14	Communications and Emails: Basics of electronic mail; getting an email account, sending and receiving emails; accessing sent emails; using emails; document collaboration.
Week 15	Computer troubleshooting: Identifying and solving common hardware and software problems that computer users encounter, basic troubleshooting techniques and tools for diagnosing and resolving issues.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Computer .
Week 2	Lab 2: Computer Hardware and Software, operating system.
Week 3	Lab 3: Word processing.
Week 4	Lab 4: presentation software.
Week 5	Lab 5: Internet and web browsers.
Week 6	Lab 6: Emails, sending emails and receiving email.
Week 7	Lab 7: Identifying and solving common hardware and software problems.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1-Graham Brown, David Watson, "Cambridge IGCSE Information and communication technology", 3 rd edition (2020) 2-Alan Evans, Kendall Martin, Mary Anne Poatsy, "Technology in action complete", 16 th edition(2020). 3-Ahmed Banafa, "Introduction to Artificial Intelligence	Yes

	(AI)", 1 st Edition (2024). الخضر على الخضر بحاث "اساسيات الحاسوب" 4-2016 الدكتور عادل عبدالنور, مدخل الى عالم الذكاء الاصطناعي" 5-2005	
Recommended Texts		
Websites		

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Digital Techniques		Module Delivery
Module Type	Core		<input type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ELE002		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	Electrical	College	College of Engineering
Module Leader	Zainab najeeb	e-mail	
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	
Scientific Committee Approval Date	10/10/2025	Version Number	

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This course introduces the student to digital fundamentals concepts, which includes: numbers systems. Codes, Types of logic gates, and Boolean expressions of different circuits. The course also examines the design of main logic circuits, along with an introduction to analysis of clocked sequential circuits, Flip-flops, types of flip-flops, there logic symbols, and excitation tables of different flip-flops .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. Understand concept of data representation and conversion between number systems.2. Understand Binary arithmetic and other code numbers arithmetic.3. Recognize the different types of codes.4. Operate on Boolean algebra, and simplification of Boolean function.5. Understand different types of logic gates, and here truth tables.6. Apply methods of simplification and minimization of Boolean expressions.7. Be familiar with multi-level gate circuits and combinational circuits.8. construct truth tables of various logic expressions.9. analyze and design procedures of Sequential circuits.10. Implement functions using digital circuit (Sequential).11. design sequential systems through the application of system reduction techniques and the use of sequential system design tools.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <ol style="list-style-type: none">1. Introduce the data, Number Systems, Conversion between Number Systems.2. 2-Complement Arithmetic, Binary Arithmetic, BCD arithmetic.3. Codes and their conversions.4. Definition of Boolean Algebra. Properties and Theorems of Boolean Algebra, Boolean Functions, Simplification of Boolean Expressions.5. Digital Logic Gates. Truth tables of logic gates.6. simplification and minimization of Boolean function using Karnaugh map,7. Multi-level gate circuits. Design of multi levels NAND and NOR gates.8. Combinational circuits design; Adder, Substrate, code conversion, magnitude comparator9. Decoder, Encoder, Multiplexer, Demultiplexer, parity generator.10. Latches and Flip-flops Types of Flip-flops, Clocked S-R Flip-flop, J-K Flip-flop,11. Triggering of Flip-flops, Excitation Table of a Flip-flop, Sequential Circuit Model,

	<p>Classification and Analysis of Sequential Circuits</p> <p>12. Registers and Shift Registers,</p> <p>13. Counters, Synchronous Counters (Ripple, Up-down mode N) counters</p> <p>14. Design Procedure of counters Circuits.</p>
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>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.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	38	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO# 2, LO# 5 and LO# 9
	Assignments	2	5 % (10)	2, 12	LO# 6 and LO# 11
	Projects / Lab.	1	10% (10)	Continuous	LO# 4, LO5 5 and LO# 6
	Report	1	10% (10)		LO# 8
Summative assessment	Midterm Exam	2 hr	15% (10)	8	LO#1 to LO# 8
	Final Exam	2hr	60% (50)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to data ,Number system and background to the combinational logic cct .
Week 2	Introduction to Complement Arithmetic, Signed Binary Numbers, Binary Arithmetic, BCD arithmetic.
Week 3	Introduction to Codes ,types and their conversions.
Week 4	Definition of Boolean Algebra. Properties and Theorems of Boolean Algebra
Week 5	Analysis of Boolean Functions, Simplification of Boolean Expressions
Week 6	Introduction to Digital Logic Gates. Types and Truth tables of logic gates
Week 7	Analysis of simplification and minimization of Boolean function using Karnaugh map.
Week 8	Midterm Exam
Week 9	Multi-level gate circuits. Design of multi levels NAND and NOR gates.
Week 10	Combinational circuits design; Adder, Substrate, code conversion, magnitude comparator
Week 11	Decoder, Encoder, Multiplexer, Demultiplexer, parity generator.
Week 12	Latches and Flip-flops Types of Flip-flops, Clocked S-R Flip-flop, J-K Flip-flop,
Week 13	Triggering of Flip-flops, Excitation Table of a Flip-flop, Sequential Circuit Model, Classification and Analysis of Sequential Circuits
Week 14	Registers and Shift Registers,
Week 15	Counters, Synchronous Counters (Ripple,Up-down mode N) counters, Design Procedure of counters Circuits
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Logic gates circuits.
Week 2	Lab 2: Combinational logic circuits.
Week 3	Lab 3: Comparator circuits.
Week 4	Lab 4: Half-adder and full adder circuit.
Week 5	Lab 5: Half sub tractor and full sub tractor.
Week 6	Lab 6: Decoder circuit and Encoder circuit..
Week 7	Lab 7: Multiplexer circuit.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	A. Saha, and N. Manna, "Digital Principles and Logic Design", Infinity Science Press LLC, (2007).	Yes
Recommended Texts	Thomas Floyd, "Digital fundamentals", 8th edition, Person education Inc.	Yes
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Fundamentals of Electrical Engineering I	Module Delivery	
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE01		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UG1		
Administering Department	Electrical	College	College of Engineering
Module Leader	thaker Mahmood Nayl	e-mail	thaker.nayl@uoanbar.edu.iq
Module Leader's Acad. Title	Assist. Prof	Module Leader's Qualification	PhD
Module Tutor	Sameh Jassam Mohammed	e-mail	samehjassam@uoanbar.edu.iq
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/June/2023	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG005	Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	<ol style="list-style-type: none"> 1. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power with Ac from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current
Indicative Contents المحتويات الإرشادية	<p>AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis.</p> <p>AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. RL, RC and RLC circuits</p> <p>Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, maximum power transfer, RMS and power dissipation.</p>

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

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	92	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	108	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	7
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	LO# 2, LO# 5 and LO# 9
	Assignments	2	5% (5)	2, 12	LO# 6 and LO# 11
	Projects / Lab.	1	10% (10)		LO# 4, LO5 5 and LO# 6
	Report	1			LO# 7
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO#1 to LO# 7
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Capacitors
Week 2	Series and Parallel Capacitors
Week 3	Inductors
Week 4	Series and Parallel Inductors
Week 5	Sinusoidal Current
Week 6	Phasors
Week 7	Impedance and Admittance
Week 8	Kirchhoff's Laws in the frequency domain
Week 9	Midterm Exam 1
Week 10	Nodal analysis in the frequency domain
Week 11	mesh analysis in the frequency domain
Week 12	Superposition in the frequency domain
Week 13	Source Transformations in the frequency domain
Week 14	Thévenin and Norton Equivalents in the frequency domain
Week 15	Maximum , Average Power Transfer, RMS value
Week 16	Midterm Exam 2

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	Lab 1: Kirchhoff's Laws
Week 2	Lab 2: Nodal Analysis

Week 3	Lab 3: Mesh Analysis
Week 4	Lab 4: Superposition Theorem
Week 5	Lab 5: Source Transformations
Week 6	Lab 6: Thévenin and Norton Equivalents
Week 7	Lab 7: Maximum Power Transfer

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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Fail Group (0 – 49)	FX – Fail	(راسب) (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language I		Module Delivery
Module Type	S		<input type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA003		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UG1	Semester of Delivery	Two
Administering Department	EE	College	ENG
Module Leader	Abdullah Khalid Ahmed	e-mail	Abdullahkhalid.ahmed@uoanbar.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name	Dr. Ehsan Hamyan Sabbar	e-mail	Ehsan.sabbar@uoanbar.edu.iq
Scientific Committee Approval Date	01/11/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. Expand vocabulary and enhance communication in everyday situations. 2. Improve grammar skills for more accurate speaking and writing. 3. Develop better listening comprehension abilities. 4. Enhance spoken English fluency, accuracy, and pronunciation. 5. Improve reading comprehension and extract key information from texts. 6. Strengthen writing skills for well-structured and grammatically accurate compositions. 7. Increase cultural awareness of English-speaking societies and customs. 																																				
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<p>By the end of successful completion of this course, the student will be able to:</p> <ol style="list-style-type: none"> 1. Develop academic writing 2. Apply reading skills 3. Expand academic vocabulary through reading 4. Speak through group discussions and debates 																																				
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <table border="1"> <tr> <td><input type="checkbox"/> Auxiliary verbs</td> <td><input type="checkbox"/> Making an offer</td> </tr> <tr> <td><input type="checkbox"/> Greetings forms</td> <td><input type="checkbox"/> prepositions</td> </tr> <tr> <td><input type="checkbox"/> Learning English words by asking</td> <td><input type="checkbox"/> Rooms and furniture</td> </tr> <tr> <td><input type="checkbox"/> Making Plurals</td> <td><input type="checkbox"/> Directions</td> </tr> <tr> <td><input type="checkbox"/> Knowing the numbers</td> <td><input type="checkbox"/> Have/ do/ go</td> </tr> <tr> <td><input type="checkbox"/> Knowing countries in English</td> <td><input type="checkbox"/> Saying years</td> </tr> <tr> <td><input type="checkbox"/> Learning how to ask about others countries/ Nationality</td> <td><input type="checkbox"/> Past simple- irregular verbs</td> </tr> <tr> <td><input type="checkbox"/> Subjects and possessive pronouns</td> <td><input type="checkbox"/> When's your birthday?</td> </tr> <tr> <td><input type="checkbox"/> Using adjectives</td> <td><input type="checkbox"/> Can/ can't</td> </tr> <tr> <td><input type="checkbox"/> Making negatives and questions</td> <td><input type="checkbox"/> Adjective+ noun</td> </tr> <tr> <td><input type="checkbox"/> Making interview and knowing personal information</td> <td><input type="checkbox"/> Going sightseeing</td> </tr> <tr> <td><input type="checkbox"/> Possessives (Verbs)</td> <td><input type="checkbox"/> I'd like- some/ any</td> </tr> <tr> <td><input type="checkbox"/> Learning how to ask about others favorites and hobbies</td> <td><input type="checkbox"/> Signs all around</td> </tr> <tr> <td><input type="checkbox"/> Using articles</td> <td><input type="checkbox"/> Present Continuous</td> </tr> <tr> <td><input type="checkbox"/> Prices and currencies</td> <td><input type="checkbox"/> In a restaurant</td> </tr> <tr> <td><input type="checkbox"/> Present simple tense</td> <td><input type="checkbox"/> Clothes- Opposite verbs</td> </tr> <tr> <td><input type="checkbox"/> The time</td> <td><input type="checkbox"/> What's matter</td> </tr> <tr> <td><input type="checkbox"/> Using some adverbs</td> <td><input type="checkbox"/> Transport</td> </tr> </table>	<input type="checkbox"/> Auxiliary verbs	<input type="checkbox"/> Making an offer	<input type="checkbox"/> Greetings forms	<input type="checkbox"/> prepositions	<input type="checkbox"/> Learning English words by asking	<input type="checkbox"/> Rooms and furniture	<input type="checkbox"/> Making Plurals	<input type="checkbox"/> Directions	<input type="checkbox"/> Knowing the numbers	<input type="checkbox"/> Have/ do/ go	<input type="checkbox"/> Knowing countries in English	<input type="checkbox"/> Saying years	<input type="checkbox"/> Learning how to ask about others countries/ Nationality	<input type="checkbox"/> Past simple- irregular verbs	<input type="checkbox"/> Subjects and possessive pronouns	<input type="checkbox"/> When's your birthday?	<input type="checkbox"/> Using adjectives	<input type="checkbox"/> Can/ can't	<input type="checkbox"/> Making negatives and questions	<input type="checkbox"/> Adjective+ noun	<input type="checkbox"/> Making interview and knowing personal information	<input type="checkbox"/> Going sightseeing	<input type="checkbox"/> Possessives (Verbs)	<input type="checkbox"/> I'd like- some/ any	<input type="checkbox"/> Learning how to ask about others favorites and hobbies	<input type="checkbox"/> Signs all around	<input type="checkbox"/> Using articles	<input type="checkbox"/> Present Continuous	<input type="checkbox"/> Prices and currencies	<input type="checkbox"/> In a restaurant	<input type="checkbox"/> Present simple tense	<input type="checkbox"/> Clothes- Opposite verbs	<input type="checkbox"/> The time	<input type="checkbox"/> What's matter	<input type="checkbox"/> Using some adverbs	<input type="checkbox"/> Transport
<input type="checkbox"/> Auxiliary verbs	<input type="checkbox"/> Making an offer																																				
<input type="checkbox"/> Greetings forms	<input type="checkbox"/> prepositions																																				
<input type="checkbox"/> Learning English words by asking	<input type="checkbox"/> Rooms and furniture																																				
<input type="checkbox"/> Making Plurals	<input type="checkbox"/> Directions																																				
<input type="checkbox"/> Knowing the numbers	<input type="checkbox"/> Have/ do/ go																																				
<input type="checkbox"/> Knowing countries in English	<input type="checkbox"/> Saying years																																				
<input type="checkbox"/> Learning how to ask about others countries/ Nationality	<input type="checkbox"/> Past simple- irregular verbs																																				
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<input type="checkbox"/> Using adjectives	<input type="checkbox"/> Can/ can't																																				
<input type="checkbox"/> Making negatives and questions	<input type="checkbox"/> Adjective+ noun																																				
<input type="checkbox"/> Making interview and knowing personal information	<input type="checkbox"/> Going sightseeing																																				
<input type="checkbox"/> Possessives (Verbs)	<input type="checkbox"/> I'd like- some/ any																																				
<input type="checkbox"/> Learning how to ask about others favorites and hobbies	<input type="checkbox"/> Signs all around																																				
<input type="checkbox"/> Using articles	<input type="checkbox"/> Present Continuous																																				
<input type="checkbox"/> Prices and currencies	<input type="checkbox"/> In a restaurant																																				
<input type="checkbox"/> Present simple tense	<input type="checkbox"/> Clothes- Opposite verbs																																				
<input type="checkbox"/> The time	<input type="checkbox"/> What's matter																																				
<input type="checkbox"/> Using some adverbs	<input type="checkbox"/> Transport																																				

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, speaking interactive activities and by considering type of activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	2.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	5	25% (25)	5, 10	LO #1, and 2
	Assignments (HW)	2	5% (5)	2, 4, 6, 8, 9, and 10	LO # 1-3
	Report	1	5% (5)		
	Activities		5% (5)	Through lectures	LO# 4
	Lab				
Summative Assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-3
	Final Exam	3 hr	50% (50)	16	All
Total Assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered	
1.	<ul style="list-style-type: none"> ● Am/ are/ is, my/ your ● How are you? ● What's this in English? ● Plurals 	<ul style="list-style-type: none"> ● This is ● Good morning! ● Numbers 1-10
2.	<ul style="list-style-type: none"> ● Countries ● Where's he from? ● Numbers 11-30 	<ul style="list-style-type: none"> ● He/ she/ they, his/ her ● Fantastic/ awful/ beautiful
3.	<ul style="list-style-type: none"> ● Jobs ● Negatives and questions ● Social expressions-1 	<ul style="list-style-type: none"> ● Am/are/is ● Personal information
4.	<ul style="list-style-type: none"> ● Our/ their ● The family ● The alphabet 	<ul style="list-style-type: none"> ● Possessive's ● Has/ have
5.	<ul style="list-style-type: none"> ● Sports/ food/ drinks ● a/ an ● Numbers and prices 	<ul style="list-style-type: none"> ● Present simple- I/ you/ we/ they ● languages and nationalities
6.	<ul style="list-style-type: none"> ● The time ● Always/ sometimes/ never ● Days of the week 	<ul style="list-style-type: none"> ● Present simple- he/ she ● Words that go together
7.	Mid-term Exam	
8.	<ul style="list-style-type: none"> ● Question words ● This/ that ● Can I? 	<ul style="list-style-type: none"> ● Me/ him/ us/ them ● adjectives
9.	<ul style="list-style-type: none"> ● Rooms and furniture ● Prepositions 	<ul style="list-style-type: none"> ● There is/ are ● Directions

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
10.	<ul style="list-style-type: none"> ● Saying years ● Past simple- irregular verbs ● When's your birthday? ● As/ were born ● Have/ do/ go
11.	<ul style="list-style-type: none"> ● Past simple- regular and irregular ● Sport and leisure ● Questions and negatives ● Going sightseeing
12.	<ul style="list-style-type: none"> ● Can/ can't ● Adjective+ noun ● Adverbs ● Everyday problems
13.	<ul style="list-style-type: none"> ● I'd like- some/ any ● Signs all around ● In a restaurant
14.	<ul style="list-style-type: none"> ● Present Continuous ● Present Simple & Present Continuous ● Clothes- Opposite verbs ● What's matter
15.	<ul style="list-style-type: none"> ● Future Plans ● Revision ● Transport ● Social Expressions-2
16.	Preparatory for final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	-John & Liz Soars, "New Headway Plus- Beginner Student's Book", 10th ed 2014	Yes
Recommended Texts	-Raymond Murphy; "English Grammar in Use", 4th edition 2012 Understanding and Using English Grammar, Vol. A, 4th Edition 4th Edition	No
Websites	<ul style="list-style-type: none"> □ https://elt.oup.com/catalogue/items/global/adult_courses/new_headway/beginner_fourth_edition/?cc=global&selLanguage=en □ https://www.amideast.org/jordan/learn-english/learn-english-online?gclid=EAlaIqObChMloeyGmdm_ggMVFWelCh2FowJ1EAAYASAAEgKjFFD_BwE 	

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

Module Approval المصادقة على وصف المادة الدراسية			
	Name	Date	Signature
Module Leader Approval		8/6/2023	
Peer Reviewer Name		8/6/2023	
Scientific Committee Members Approval		8/6/2023	
		8/6/2023	
		8/6/2023	
		8/6/2023	
		8/6/2023	

Scientific Committee Head Approval I		8/6/2023	
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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Mechanics I (Static)		Module Delivery
Module Type	Supportive		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ENG006		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI	Semester of Delivery	
Administering Department	ME	College	ENG
Module Leader	Dr. Ammar ahmed	e-mail	
Module Leader's Acad. Title	Assit. Prof.	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	20/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. Force system 2. Equilibrium of particles 3. Force System Resultants 4. Equilibrium of a Rigid Body 5. Trusses: method of joint and sections 6. Frames 7. Centroid 8. Moment of inertia 9. frictions
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. To determine the resultant of Coplanar forces in two and three dimensions 2. To introduce the concept of the free-body diagram for a particle. 3. To show how to solve particle equilibrium problems using the equations of equilibrium. 4. To provide a method for finding the moment of a force about a specified axis. 5. To define the moment of a couple. 6. To present methods for determining the resultants of non-concurrent force systems. 7. To indicate how to reduce a simple distributed loading to a resultant force having a specified location. 8. To develop the equations of equilibrium for a rigid body. 9. To introduce the concept of the free-body diagram for a rigid body. 10. To show how to determine the forces in the members of a truss using the method of joints and the method of sections. 11. To analyze the forces acting on the members of frames and machines composed of pin-connected members. 12. To show how to determine the location of the center of gravity and centroid for a system of discrete particles and a body of arbitrary shape. 13. To develop a method for determining the moment of inertia for an area. 14. To introduce the product of inertia and show how to determine the maximum and minimum moments of inertia of an area 15. To introduce the concept of dry friction and show how to analyze the equilibrium of rigid bodies subjected to this force.
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"> 1. Force system: Resultant of forces on particles in two and three dimensions. 2. Equilibrium of particles: Free-Body-diagram, equation of equilibrium. 3. Force System Resultants: resultant of force and moment on rigid body, couples, moment about point in two and three dimensions, moment about axis. 4. Equilibrium of a Rigid Body: Free-Body Diagrams, Equations of Equilibrium. 5. Trusses: method of joint and sections 6. Frames: Free-Body Diagrams, Equations of Equilibrium. 7. Centroid: Centroids of Lines, Areas, and Volumes. <p>Moment of inertia: Parallel-Axis Theorem for an Area, Radius of Gyration of an Area, Moments of Inertia for Composite Areas.</p>

1. Friction: Mechanism of Dry Friction, Static Friction.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to:
	<ol style="list-style-type: none"> 1. Encourage students' participation in the exercises 2. Refining and expanding their critical thinking skills. <p>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.</p>

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	62	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	88	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	4	20% (20)	3,5,7,9,11,13	LO # All
	Assignments	2	10% (10)	2, 12	LO # 4, 5, 6, 10.
	Projects / Lab.				
	Report	-	10% (10)	-	-
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All

Total assessment	100% (100 Marks)		
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Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Force system
Week 2	Force system
Week 3	Equilibrium of particles
Week 4	Equilibrium of particles
Week 5	Force System Resultants
Week 6	Force System Resultants
Week 7	Equilibrium of a Rigid Body
Week 8	Equilibrium of a Rigid Body
Week 9	Trusses: method of joint and sections
Week 10	Trusses: method of joint and sections
Week 11	Frames
Week 12	Frames
Week 13	Centroid
Week 14	Moment of inertia
Week 15	frictions
Week 16	Final Exams

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	

Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	R. C. Hibbeler, "Engineering Mechanics - Statics " 13th Edition, 2012	Yes
Recommended Texts	J.L Meriam and L.G. Kraige (2016) Engineering mechanics statics	Yes
Websites		

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Calculus III		Module Delivery	
Module Type	B (Basic learning activities)		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ENG008			
ECTS Credits	5			
SWL (hr/sem)	125 (Student Workload)			
Module Level	2	Semester of Delivery		3
Administering Department	Electrical Engineering	College	College of Engineering	
Module Leader	Abdullah Fawzi Shafeeq		e-mail	abdullah.fawzi@uoanbar.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ms.c	
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	01/06/2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG04	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of engineering Mathematics. Specifically, the basic concepts of vectors, lines, and planes. Partial differential equations. Multiple and surface integrations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Understand the Vectors and The Geometry of Space. 2. Understand the Lines and Planes in Space. 3. Understand the Vector Functions and Motion in Space. 4. Understand the partial derivatives 5. Explain multiple and surface integrations.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <ol style="list-style-type: none"> 1. Vectors and the Geometry of Space: Three-Dimensional Coordinate Systems, Vectors, The Dot Product, The Cross Product, Lines and Planes in Space, Cylinders and Quadric Surfaces 2. Vector-Valued Functions and Motion in Space: Curves in Space and Their Tangents, Integrals of Vector Functions; Projectile Motion, Arc Length in Space, Curvature and Normal Vectors of a Curve, Tangential and Normal Components of Acceleration 3. Partial Derivatives: Functions of Several Variables, Limits and Continuity in Higher Dimensions, Partial Derivatives, The Chain Rule, Directional Derivatives and Gradient Vectors, Tangent Planes and Differentials, Extreme Values and Saddle Points. 4. Multiple Integrals: Double and Iterated Integrals over Rectangles, Double Integrals over General Regions, Area by Double Integration, Double Integrals over polar coordinates Triple Integrals in Rectangular Coordinates, Triple Integrals in cylindrical and spherical coordinates.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage student's 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 some activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25% (25)	3,6,9,11, and 13	
	Assignments	2	6% (6)	4 and 12	
	Activities	1	5% (5)	7	
	Report	1	4% (4)	12	
Summative assessment	Midterm Exam	2hr	10% (10)	9	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

Week	Material Covered
Week 1	Three-Dimensional Coordinate Systems
Week 2	Vectors
Week 3	Product of Vectors
Week 4	Lines and Planes in Space
Week 5	Vector-Valued Functions and Motion in Space
Week 6	Curvature and Normal Vectors of a Curve
Week 7	Partial Derivatives
Week 8	Partial Derivatives
Week 9	Midterm Exam
Week 10	Directional Derivatives and Gradient Vectors
Week 11	Tangent Planes, Normal Lines, Extreme Values and Saddle Points
Week 12	Double Integrals
Week 13	Double Integrals
Week 14	Triple Integrals
Week 15	Triple Integrals
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas' Calculus Early Transcendentals 12 th Edition by George B. Thomas Jr. (Author), Maurice D. Weir (Author), Joel R. Hass (Author).	Yes
Recommended Texts	Advanced Engineering Mathematics 10 th Edition by Erwin Kreyszig (Author), Herbert Kreyszig (Author), Edward J. Norminton (Author)	Yes
Websites		

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	DC Machines I	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE015		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UG2	Semester of Delivery	3
Administering Department	Electrical	College	College of Engineering
Module Leader	Settar Subry Keream	e-mail	Settar.keream@uoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/sep/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE001	Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of DC machines. Specifically, the generator operation, Dc motors
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-This course is designed to enable the students to understand the DC machines as a required at department level. 2-The course integrates the Generator-principle of rotating electrical machines and calculation of induced e.m.f., energy, power and torque in DC machines .3- Construction of DC machines and function of commutator. Type of armature windings. 4-Calculation of m.m.f. per pole. Type of excitation connections. Armature reaction. Commutation.
Indicative Contents المحتويات الإرشادية	DC MACHINE BASICS: Basic Interactions, Wire loop, Commutator, Armature, Magnetic Field, Armature Coil Equations, Coil emf, Coil Torque, Coil Resistance, Electromechanical Power Conversion, Generator Action, Motor action, CONSTRUCTION: Materials, Temperature Rise, Machine Rating, Main parts of the DC machine. ARMATURE WINDING: Winding details, Winding Schemes, Lap winding, Wave winding, Armature Calculations. MAIN FIELD: Main Field Distribution, Field excitation, Magnetization curve ARMTURE REACTION: Distributed Armature m.m.f., Resultant field, Effects of armature reaction, Demagnetizing effect, Treatment of Armature Reaction, Brush shift, Commutation: The Process of Commutation, Equivalent circuit of commutating coil, Linear Commutation, Treatment of sparking, Interpoles, Losses of DC machine

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

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	LO# 1, LO# 2 and LO# 4
	Assignments	2	5% (5)	2, 12	LO# 2 and LO# 4
	Projects / Lab.	1	10% (10)		LO# 3 and LO# 4
	Report	1			LO# 3
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO# 1 and LO# 2
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	DC MACHINE BASICS: Basic Interactions, Wire loop,
Week 2	Commutator, Armature, Magnetic Field, Armature Coil Equations, Coil emf, Coil Torque, Coil Resistance,
Week 3	Electromechanical Power Conversion, Generator Action, Motor action,
Week 4	CONSTRUCTION: Materials, Temperature Rise, Machine Rating, Main parts of the DC machine.
Week 5	ARMATURE WINDING: Winding details, Winding Schemes, Lap winding, Wave winding, Armature Calculations
Week 6	MAIN FIELD: Main Field Distribution, Field excitation, Magnetization curve
Week 7	ARMATURE REACTION: Distributed Armature m.m.f., Resultant field, Effects of armature reaction, Shift of the magnetic neutral axis, Treatment of Armature Reaction
Week 8	Midterm Exam
Week 9	Commutation: The Process of Commutation, Equivalent circuit of commutating coil, Linear Commutation, Treatment of sparking, Interpoles, Brush shift
Week 10	GENERATOR OPERATION: The Voltage Equation, Speed of Rotation, Field excitation
Week 11	Voltage drops, Definitions,
Week 12	Voltage control, Voltage regulation
Week 13	Voltage Build-Up,.
Week 14	Applications, Parallel operation
Week 15	losses
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	LAB1: The construction of DC Machines
Week 2	LAB2: Building- up voltage of self – excited shunt generator
Week 3	LAB3: Characteristic of separately excited generator
Week 4	LAB4: Characteristic of self – excited shunt generator
Week 5	LAB5: Characteristic of a. compound generator and b. series generator
Week 6	LAB6: separation of mechanical , eddy – current and hysteresis losses in DC generator by an auxiliary motor
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Theraja and Theraja (A Textbook of Electrical Technology) volume I basic electrical engineering in S.I. System of units revised by: Tarnekar Chand an ISO 9001:2000 company Chand & company ltd. Ram Nagar (2005)	yes
Recommended Texts		
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Digital Techniques II		Module Delivery
Module Type	Core		<input type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ELE040		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UG2	Semester of Delivery	
Administering Department	Electrical	College	College of Engineering
Module Leader	Mohammad A.Faraj	e-mail	Mohammed.Faraj@uoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	
Scientific Committee Approval Date	10/9/2025	Version Number	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE002	Semester	2
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims أهداف المادة الدراسية</p>	<p>This course introduces the student to understand the Flip-flops, types of flip-flops, there logic symbols, and excitation tables of different flip-flops. The course also examines the design of main logic circuits, along with an introduction to analysis of clocked sequential circuits and the topics of sequential circuit analysis and design, PLD, and Logic families.</p>
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. analyze and design procedures of Sequential circuits. 2. Implement functions using digital circuit (Sequential). 3. design sequential systems through the application of system reduction techniques and the use of sequential system design tools 4. Differentiate between Logic families. 5. Define the problem (Inputs and Outputs) of the PLDs, and write its functions 6. Use simulation software, for testing the designed circuit. 7. Describe the difference between combinational and sequential logic circuits, and the applications of various memory units. 8. Implement functions using digital circuit (Sequential).
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <ol style="list-style-type: none"> 1. Latches and Types of Flip-flops, Clocked S-R Flip-flop, J-K Flip-flop, 2. Clocked D Flip-flop, T Flip-flop, Toggling Mode of S-R and D Flip-flops, 3. Triggering of Flip-flops, Excitation Table of a Flip-flop, Sequential Circuit Model, Classification of Sequential Circuits 4. Analysis of Sequential Circuits, 5. Registers and Shift Registers, 6. Counters, 7. Synchronous Counters. 8. Ripple (Asynchronous) Counters. 9. Up-down counter, mode N counters ,Code converters counters 10. Sequential circuits: design, implementation and minimization 11. Sequential Circuits with Programmable Logic Devices: introduction, and types of PLDs 12. Random-Access Memory. Memory Decoding. Read-Only Memory. 13 . Integrated circuit technologies, basic concepts, major IC technologies: TTL and CMOS.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	45	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	30	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25% (10)	1,3,5, 8,10	LO# 2, LO# 5 and LO# 9
	Assignments	2	5 % (10)	2, 12	LO# 6 and LO# 11
	Projects / Lab.	1	5% (10)	Continuous	LO# 4, LO5 5 and LO# 6
	Report	1	5% (10)		LO# 8
Summative assessment	Midterm Exam	2 hr	10% (10)	8	LO#1 to LO# 8
	Final Exam	2hr	50% (50)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Latches and Types of Flip-flops,
Week 2	Clocked S-R Flip-flop, J-K Flip-flop, Clocked D Flip-flop, T Flip-flop, Toggling Mode of S-R and D Flip-flops
Week 3	Introduction to Triggering of Flip-flops, Excitation Table of a Flip-flop,

Week 4	Definition Registers and Shift Registers,
Week 5	Introduction to Counters,
Week 6	Analysis of Synchronous Counters.
Week 7	Analysis of Ripple (Asynchronous) Counters.
Week 8	Midterm Exam
Week 9	Up-down counter,
Week 10	mode N counters ,
Week 11	Code converters counters
Week 12	Fundamentals of Random-Access Memory Read-Only Memory and . Memory Decoding.
Week 13	Introduction to Programmable Logic Devices (PLDs)
Week 14	Integrated circuit technologies, basic concepts, major IC technologies:
Week 15	Introduction to TTL and CMOS
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	A. Saha, and N. Manna, "Digital Principles and Logic Design", Infinity Science Press LLC, (2007).	Yes
Recommended Texts	Thomas Floyd, "Digital fundamentals", 8th edition, Person education Inc.	Yes

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Electric Circuits I	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE003		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UG2	Semester of Delivery	3
Administering Department	Electrical	College	College of Engineering
Module Leader	Mushtaq Najeeb Ahmed	e-mail	mushtaq.najeeb@uoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	1/Oct/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE001	Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course is a first course on electric circuits. The course is designed to provide students with an importance for electrical engineering field: Natural and Step Response of RL and RC Circuits, Sequential Switching; Natural and Step Response of Parallel and Series RLC Circuits. Operation Amplifiers. Balanced Three-Phase Circuits, Analysis of circuits (Wye, Delta); Power Calculations. Unbalanced Three-Phase systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Response of RL and RC circuits: Natural and step responses of RL and RC circuits. Natural and step responses of RLC circuits 2. Operational amplifier terminals, terminal voltages and currents, the inverting and non-inverting amplifier circuit, the summing-amplifier circuit, and the difference –amplifier circuit 3. Balanced Three-Phase Circuits: 3-P Voltages, 3-P Voltage Sources, Analysis of Y-Δ transformation; Power Calculations and Measurements of Average Power in 3-PCircuits. 5.Unbalanced Three-Phase systems
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> ● Analyze and determine the complete response of RL, RC and RLC circuits ● Analyze inverting, summing, and noninverting Op amp circuits. ● understand 3-phase system and its power calculation. ● apply delta–wye or wye–delta transformation in Three-Phase Circuits as necessary to simplify circuit analysis.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, 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.

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4.133
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.867
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25%		LO# 1, LO# 2 and LO# 3
	Assignments	1	5 %		LO# 1 and LO# 2
	Activities	1	5 %		
	Report	1	5 %		
Summative assessment	Midterm Exam	1hr	10 %		LO# 1 and LO# 2
	Final Exam	3hr	50 %		All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Operational Amplifier (Ideal, Inverting, and Non-inverting)
Week 2	Operational Amplifier (Summing, Subtracting, Cascaded, Integrator, and Differentiator)
Week 3	Source-Free RC Circuit
Week 4	Source Free RL Circuit
Week 5	Step Response of RC Circuit
Week 6	Step Response of RL Circuit
Week 7	Introduction to Second Order Circuits
Week 8	Source Free Series RLC Circuit
Week 9	Source Free Parallel RLC Circuit
Week 10	Step Response of Series RLC Circuit
Week 11	Step Response of Parallel RLC Circuit
Week 12	Introduction to Three-Phase Circuits
Week 13	Balanced Wye - Wye Connection
Week 14	Balanced Wye-Delta و Delta-Wye, Delta-Delta Connections
Week 15	Power in Balanced System and Unbalanced 3-phase Systems
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	
Week 2	

Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Charles K. Alexander, Matthew N. O. Sadiku "Fundamentals of Electric Circuits" Fifth edition.	No
Recommended Texts	James W. Nilsson, Susan A. Riedel "Electric Circuits" Ninth edition	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Electromagnetic Fields I	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE005		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UG2	Semester of Delivery	3
Administering Department	Electrical	College	College of Engineering
Module Leader	Ahmed A. Abbas	e-mail	Ahmed.abbas@uoanbar.edu.iq
Module Leader's Acad. Title	Assist.prof.Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/oct/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG004	Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course is designed for students to understand vector analysis, Coulomb's law and electric field intensity, Electric flux density, Gauss's law and divergence, Energy and potential.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Understand the fundamental of vector concepts and operation. 2. Understand the Coulomb's law and electric field intensity. 3. Understand the electric flux density, Gauss's law, divergence and the divergence theorem. 4. Use Coulomb's law and Gauss's law to find the electric field about many distributions of charge.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> • The fundamental of vector concepts and operation. • The Coulomb's law and electric field intensity. • The electric flux density, Gauss's law, divergence and the divergence theorem. • Coulomb's law and Gauss's law to find the electric field about many distributions of charge.

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

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	47	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	78	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	LO# 2, LO# 3 and LO# 4
	Assignments	2	5% (5)	2, 12	LO# 2 and LO# 4
	Projects / Lab.	1	10% (10)		
	Report	1			
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO# 1 and LO# 2
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Vector analysis, scalars and vectors, vector algebra, the Cartesian coordinates system,
Week 2	Vector components and unit vector, the vector field.
Week 3	The dot products, the cross product, other coordinates system: circular cylindrical coordinates, the spherical coordinates system.
Week 4	The experimental law of Coulomb, Electric field intensity, field due to continuous volume charge distribution.
Week 5	Field of line charge, field of a sheet charge.
Week 6	Electric flux density, Gauss's law, Application of Gauss's law: some symmetrical charge distributions.
Week 7	Application of Gauss's law: some symmetrical charge distributions.
Week 8	Midterm Exam
Week 9	Application of Gauss's law: Differential volume element, divergence, Maxwell s first equation (Electrostatics filed).
Week 10	The vector operator and the divergence theorem.
Week 11	Energy expended in moving a point charge in electric field, line integral, definition of potential difference and potential.
Week 12	Potential field of point charge.
Week 13	The potential field of a system of charges.
Week 14	Potential Gradient, the Dipole.
Week 15	Energy density in the electrostatic field.
Week 16	Final Exam

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	William H. Hayt, Jr and Jone A. Buck "Engineering Electromagnetics" 6th Edition.	Yes
Recommended Texts		
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	English Language II		Module Delivery
Module Type	S		<input type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOA 004		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UG2	Semester of Delivery	Three
Administering Department	EE	College	Engineering
Module Leader	Abdullah Khalid Ahmed	e-mail	Abdullahkhalid.ahmed@uoanbar.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor		e-mail	
Peer Reviewer Name	Dr. Ehsan Hamyan Sabbar	e-mail	Ehsan.sabbar@uoanbar.edu.iq
Scientific Committee Approval Date	01/11/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	English Language I	Semester	2
Co-requisites module	None	Semester	-

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	<ol style="list-style-type: none"> 1. Expand vocabulary and enhance communication in everyday situations. 2. Improve grammar skills for more accurate speaking and writing. 3. Develop better listening comprehension abilities. 4. Enhance spoken English fluency, accuracy, and pronunciation. 5. Improve reading comprehension and extract key information from texts. 6. Strengthen writing skills for well-structured and grammatically accurate compositions. 7. Increase cultural awareness of English-speaking societies and customs. 																																																
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of successful completion of this course, the student will be able to: <ol style="list-style-type: none"> 1. Develop academic essay writing proficiency 2. Promote reading skills 3. Expand academic vocabulary through reading 4. Promote speaking ability through group discussions and debates 5. Promote critical thinking skills 																																																
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Tenses</td> <td><input type="checkbox"/> Question forms</td> </tr> <tr> <td><input type="checkbox"/> Vocabulary (Jobs)</td> <td><input type="checkbox"/> Writing (informal letter)</td> </tr> <tr> <td><input type="checkbox"/> Present simple</td> <td><input type="checkbox"/> Have/have to</td> </tr> <tr> <td><input type="checkbox"/> Present continuous</td> <td><input type="checkbox"/> Writing (Linking words +Describing a person)</td> </tr> <tr> <td><input type="checkbox"/> Past simple</td> <td><input type="checkbox"/> Have + noun</td> </tr> <tr> <td><input type="checkbox"/> Past continuous</td> <td><input type="checkbox"/> Writing (a story 1)</td> </tr> <tr> <td><input type="checkbox"/> Count and uncount nouns</td> <td><input type="checkbox"/> Articles</td> </tr> <tr> <td><input type="checkbox"/> Expression of quantity</td> <td><input type="checkbox"/> Vocabulary (clothes)</td> </tr> <tr> <td><input type="checkbox"/> Verb patterns</td> <td><input type="checkbox"/> Writing (filling in forms)</td> </tr> <tr> <td><input type="checkbox"/> Would like and like</td> <td><input type="checkbox"/> Will and going to</td> </tr> <tr> <td><input type="checkbox"/> What ... like?</td> <td><input type="checkbox"/> Writing (postcard)</td> </tr> <tr> <td><input type="checkbox"/> Comparative and superlatives</td> <td><input type="checkbox"/> Vocabulary (adjective formation)</td> </tr> <tr> <td><input type="checkbox"/> Present perfect</td> <td><input type="checkbox"/> Writing (relative clauses)</td> </tr> <tr> <td><input type="checkbox"/> Tense revision</td> <td><input type="checkbox"/> Vocabulary (men and women)</td> </tr> <tr> <td><input type="checkbox"/> have to & got to</td> <td><input type="checkbox"/> Writing (a biography)</td> </tr> <tr> <td><input type="checkbox"/> have to & should & must</td> <td><input type="checkbox"/> Vocabulary (job description)</td> </tr> <tr> <td><input type="checkbox"/> Present simple or will</td> <td><input type="checkbox"/> Writing (formal letter)</td> </tr> <tr> <td><input type="checkbox"/> Conditional clauses</td> <td><input type="checkbox"/> Time clauses</td> </tr> <tr> <td><input type="checkbox"/> Verb patterns</td> <td><input type="checkbox"/> Writing (discussing ideas)</td> </tr> <tr> <td><input type="checkbox"/> Used to</td> <td><input type="checkbox"/> Infinitives</td> </tr> <tr> <td><input type="checkbox"/> The passive form</td> <td><input type="checkbox"/> Writing (formal letters)</td> </tr> <tr> <td><input type="checkbox"/> Active and passive</td> <td><input type="checkbox"/> Vocabulary (words with more than one meaning)</td> </tr> <tr> <td><input type="checkbox"/> Second conditional</td> <td><input type="checkbox"/> Writing (email)</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Vocabulary (phrasal verbs)</td> </tr> </table>	<input 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superlatives	<input type="checkbox"/> Vocabulary (adjective formation)	<input type="checkbox"/> Present perfect	<input type="checkbox"/> Writing (relative clauses)	<input type="checkbox"/> Tense revision	<input type="checkbox"/> Vocabulary (men and women)	<input type="checkbox"/> have to & got to	<input type="checkbox"/> Writing (a biography)	<input type="checkbox"/> have to & should & must	<input type="checkbox"/> Vocabulary (job description)	<input type="checkbox"/> Present simple or will	<input type="checkbox"/> Writing (formal letter)	<input type="checkbox"/> Conditional clauses	<input type="checkbox"/> Time clauses	<input type="checkbox"/> Verb patterns	<input type="checkbox"/> Writing (discussing ideas)	<input type="checkbox"/> Used to	<input type="checkbox"/> Infinitives	<input type="checkbox"/> The passive form	<input type="checkbox"/> Writing (formal letters)	<input type="checkbox"/> Active and passive	<input type="checkbox"/> Vocabulary (words with more than one meaning)	<input type="checkbox"/> Second conditional	<input type="checkbox"/> Writing (email)		<input type="checkbox"/> Vocabulary (phrasal verbs)
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	<input type="checkbox"/> Vocabulary (phrasal verbs)																																																

	<input type="checkbox"/> Might	<input type="checkbox"/> Writing (a story 2)
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, speaking interactive activities and by considering type of activities that are interesting to the students.
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	30	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	20	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative Assessment	Quizzes	5	25% (25)	5, 10	LO #1, and 2
	Assignments (HW)	2	5% (5)	2, 4, 6, 8, 9, and 10	LO # 1-3
	Report	1	5% (5)		
	Activities		5% (5)	Through lectures	LO# 4
	Lab				
Summative Assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-3
	Final Exam	3 hr	50% (50)	16	All
Total Assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered	
1.	<ul style="list-style-type: none"> ● Tenses ● Using a bilingual dictionary 	<ul style="list-style-type: none"> ● Questions ● Social expressions-1
2.	<ul style="list-style-type: none"> ● Present tenses ● Collection: daily life 	<ul style="list-style-type: none"> ● Have/ have got ● Making conversation
3.	<ul style="list-style-type: none"> ● Past tenses ● Time expressions 	<ul style="list-style-type: none"> ● Word formation ● Personal information
4.	<ul style="list-style-type: none"> ● Much/ many- ● a few, a little, a lot of ● Shopping 	<ul style="list-style-type: none"> ● some/ any ● Articles ● Prices
5.	<ul style="list-style-type: none"> ● Verb patterns-1 ● Hot verbs 	<ul style="list-style-type: none"> ● Future forms ● How do you feel?
6.	<ul style="list-style-type: none"> ● What Like? ● Synonyms and antonyms 	<ul style="list-style-type: none"> ● Comparatives and superlatives ● Directions
7.	Mid-term Exam	
8.	<ul style="list-style-type: none"> ● Present perfect ● Adverbs word pairs 	<ul style="list-style-type: none"> ● For, since ● Short answers
9.	<ul style="list-style-type: none"> ● Have (go) to ● Words that go together 	<ul style="list-style-type: none"> ● Should/ must ● At the doctor's
10.	<ul style="list-style-type: none"> ● Time clauses ● Hot verbs 	<ul style="list-style-type: none"> ● If ● In the hotel
11.	<ul style="list-style-type: none"> ● Verb patterns-2 ● -ed/ -ing adjectives 	<ul style="list-style-type: none"> ● Manage to, used to ● Exclamations
12.	<ul style="list-style-type: none"> ● Passives ● Notices 	<ul style="list-style-type: none"> ● Verbs and nouns that go together ● Adverbs

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
13.	<ul style="list-style-type: none"> <li style="width: 50%;">● Second conditional <li style="width: 50%;">● Might <li style="width: 50%;">● Phrasal verbs <li style="width: 50%;">● Social expressions-2
14.	<ul style="list-style-type: none"> <li style="width: 50%;">● Present perfect continuous <li style="width: 50%;">● Word information <li style="width: 50%;">● Present perfect simple vs. continuous <li style="width: 50%;">● Writing letters
15.	<ul style="list-style-type: none"> <li style="width: 50%;">● Past perfect for clarification <li style="width: 50%;">● Hot verbs <li style="width: 50%;">● Reported statements <li style="width: 50%;">● Saying goodbye
16.	Final Exam preparatory

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	-John & Liz Soars, "New Headway Plus- Pre-Intermediate Student's Book", 10th ed 2012	Yes
Recommended Texts	-Raymond Murphy; "English Grammar in Use", 4th edition 2012 Understanding and Using English Grammar, Vol. A, 4th Edition 4th Edition	No
Websites	<ul style="list-style-type: none"> □ https://elt.oup.com/catalogue/items/global/adult_courses/new_headway/pre-intermediate_fourth_edition/?cc=global&sellLanguage=en&mode=hub □ https://www.amideast.org/jordan/learn-english/learn-english-online?gclid=EAIaIQobChMloeyGmdm_ggMVFweLCh2FowJ1EAAYASAAEgKjFFD_BwE 	

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

Module Approval المصادقة على وصف المادة الدراسية			
	Name	Date	Signature
Module Leader Approval		8/6/2023	
Peer Reviewer Name		8/6/2023	
Scientific Committee <u>Members Approval</u>		8/6/2023	
		8/6/2023	
		8/6/2023	
		8/6/2023	
		8/6/2023	
Scientific Committee <u>Head Approval</u>		8/6/2023	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Fundamentals of Electronics I	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE007		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UG2	Semester of Delivery	3
Administering Department	Electrical	College	College of Engineering
Module Leader	Hamid raddam	e-mail	hamid.radam@uoanbar.edu.iq
Module Leader's Acad. Title	M _{Sc}	Module Leader's Qualification	Master
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/oct/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE001	Semester	2
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The goals of this course are to enable students to: 1) Explanation of the physical structure of the semiconductors. 2) Analysis of a pn diode operation, description of the device characteristics 3) Investigation of diode circuits and applications 4) Analysis of a BJT, description of device characteristics 5) Definition of DC biasing circuits of BJTs, distinguishing the differences between circuits
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. After successfully completing the course, the students will be able to: 2. Apply mathematics, science, and engineering to analyze and design electronic circuits 3. Identify, formulate, and solve engineering problems in the area circuits and systems. 4. Identify and characterize different semiconductor devices (P-N Junction and BJT) 5. explain different diode and transistor applications (clipping, clamping, amplifier, ...) 6. Analyze and design different electronic circuits contain semiconductor devices using devices' models. 7. understand the design parameters and different characteristics of small signal BJT amplifiers.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> • Introduction to Electronic devices and systems. • Construction of pn Diodes, BJT, FET and other Devices. • Characteristics and operation Principals of Electronics Devices. • Practical applications of pn Diodes, BJT, FET and others Devices. • DC and AC Biasing and analysis of electronic circuits.

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

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	LO# 2, LO# 3 and LO# 5
	Assignments	2	5% (5)	2, 12	LO# 3 and LO# 4
	Projects / Lab.	1	10% (10)		LO# 2, LO# 3 and LO# 5
	Report	1			
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO# 1 to LO# 4
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Semiconductor Materials and PN Junction
Week 2	Forward biased, Reversed biased, and I-V. Relationship
Week 3	Diode and Zener diode circuits: DC analysis, models and applications
Week 4	Bipolar junction transistor Introduction
Week 5	Transistor Structure
Week 6	biasing, and I-V Relationship
Week 7	DC analysis of transistor circuits- Part I
Week 8	DC analysis of transistor circuits -Part II
Week 9	Basic transistor applications: Switch, Digital Logic, etc
Week 10	Basic transistor amplifier configuration
Week 11	Design and applications
Week 12	Bias Stabilization
Week 13	Field Effect Transistors (FETs): Structure and Operation of JFET
Week 14	P-Channel, N-Channel,
Week 15	Enhancement-Mode, Depletion-Mode MOSFETs
Week 16	Final Exam

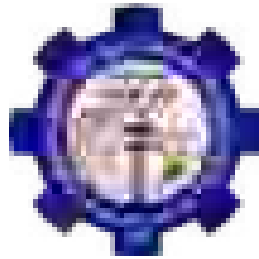
Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	electronics I lab:1 -Lab Equipment Familiarization
Week 2	electronics I lab:2 -Diode Characteristics and

Week 3	electronics I lab:3 -Diode Applications (1)
Week 4	electronics I lab:4 -Diode Applications (2)
Week 5	electronics I lab:5 -Zener Diode Characteristic
Week 6	electronics I lab:6 -Zener Diode Applications
Week 7	Electronics 1lab:7 -Emitting Light Diode

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• Robert L. Boylestad and Louis Nashelsky, "Electronic Devices and Circuit Theory", 11th edition, Pearson, 2013.	No
Recommended Texts	• Robert L. Boylestad and Louis Nashelsky, "Electronic Devices and Circuit Theory", 10th edition, Pearson, 2013.	No
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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Fail Group (0 - 49)	FX – Fail	(راسب) قيد المعالجة	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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



مفردات المنهج لمادة جرائم حزب البعث قسم الهندسة الكهربائية للعام الدراسي 2023-2024



بناءً على التوجيهات الصادرة من عمادة كلية الهندسة ورئاسة الجامعة والتوجيهات المركزية من وزارة التعليم العالي والبحث العلمي بخصوص المفردات والخطة الدراسية لمادة جرائم حزب العث في العراق. ادناه المنهاج الدراسي الاكمل للمادة والذي يتضمن:

- 1- المفردات الدراسية.
- 2- الخطة الدراسية المتبعة.
- 3- عدد الساعات المخصصة.
- 4- أسماء التدريسيين المكلفين بالمادة.

● المفردات الدراسية لمادة جرائم حزب البعث في العراق

ت	المفردات الدراسية	الوصف
1	المقدمة	مقدمة عامة عن المنهج
2	الفصل الاول	جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005 م
3	الفصل الثاني	الجرائم النفسية والاجتماعية وأثارها، وأبرز انتهاكات النظام البعثي في العراق
4	الفصل الثالث	الجرائم البيئية لنظام البعث في العراق
5	الفصل الرابع	جرائم المقابر الجماعية

● الخطة الدراسية لمادة جرائم حزب البعث

ت	وصف مادة المحاضرة	الاسبوع	نوع المحاضرة
1	<ul style="list-style-type: none"> ■ مقدمة عامة عن المنهج ■ جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005 م أقسام الجرائم. ■ مفهوم الجرائم واقسامها. ■ تعريف الجريمة لغة واصطلاحاً. 	الأول	نظري حضوري
2	<ul style="list-style-type: none"> ■ جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام 2005 ■ أنواع الجرائم الدولية ■ القرارات الصادرة من المحكمة الجنائية العليا. 	الثاني	نظري حضوري
3	<ul style="list-style-type: none"> ■ الجرائم النفسية والاجتماعية وأثارها، وأبرز انتهاكات النظام البعثي في العراق. ■ الجرائم النفسية . ■ آليات الجرائم النفسية . ■ آثار الجرائم النفسية . 	الثالث	نظري حضوري



نظري حضوري	الرابع	<ul style="list-style-type: none"> ▪ الجرائم الاجتماعية ▪ عسكرية المجتمع . ▪ موقف النظام البعثي من الدين 	4
نظري حضوري	الخامس	<ul style="list-style-type: none"> ▪ انتهاكات القوانين العراقية. 	5
نظري حضوري	السادس	<ul style="list-style-type: none"> ▪ صور انتهاكات حقوق الإنسان وجرائم السلطة -1 . 	6
امتحان حضوري	السابع	الامتحان الشهري الاول	7
نظري حضوري	الثامن	<ul style="list-style-type: none"> ▪ صور انتهاكات حقوق الإنسان وجرائم السلطة -2 ▪ بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث . ▪ أماكن السجون والاحتجاز لنظام البعث . 	8
نظري حضوري	التاسع	<ul style="list-style-type: none"> ▪ الجرائم البيئية لنظام البعث في العراق . ▪ التلوث الحربي والإشعاعي وانفجار الألغام 	9
نظري حضوري	العاشر	<ul style="list-style-type: none"> ▪ تدمير المدن والقرى (سياسة الأرض المحروقة) 	10
نظري حضوري	الحادي عشر	<ul style="list-style-type: none"> ▪ تجفيف الأهوار ▪ تجريف بساتين النخيل والأشجار والمزروعات 	11
نظري حضوري	الثاني عشر	<ul style="list-style-type: none"> ▪ جرائم المقابر الجماعية ▪ أحداث مقابر الإبادة الجماعية المرتكبة من النظام البعثي في العراق 	12
نظري حضوري	الثالث عشر	<ul style="list-style-type: none"> ▪ التصنيف الزمني لمقابر الإبادة الجماعية في العراق للمدة 1963 م – 2003 م. 	13
نظري حضوري	الرابع عشر	<ul style="list-style-type: none"> ▪ التصنيف الزمني لمقابر الإبادة الجماعية في العراق للمدة 1963 م – 2003 م. 	14
نظري حضوري	الخامس عشر	الامتحان الشهري الثاني	15
نظري حضوري	السادس عشر	الامتحان النهائي	16

• عدد الساعات المخصصة وجدول المادة:

- عدد الساعات هي 2 ساعة أسبوعياً.
- عدد الساعات الكلية في الفصل هي 30 ساعة.
- الجدول الأسبوعي:



الجدول الأسبوعي للمحاضرات

للفصل الدراسي الأول للعام 2023-2024

المرحلة: الثانية- شعبة A

اسم التدريسي	اسم المادة	موعد المحاضرة	اليوم
م.د. زياد طارق إبراهيم	Digital Techniques I	08:30am - 11:00am	الأحد
م.د. حامد ردام حسين	English Language II	11:00am - 01:30pm	
م. عبدالله خالد احمد	Fundamentals of Electronics I	01:30pm - 03:00pm	
د. محمد عبدالرحمن فرج	Calculus III	08:30am - 11:00am	الاثنين
ا.م.د. احمد عبداللطيف عباس	Electromagnetic Fields I	11:00am - 01:30pm	
-	-	01:30pm - 02:30pm	
المهندس عمر عبدالله حمود, م.م. سامح جسام محمد, م.م. شهد فاضل جابر, م.م. مصطفى لطيف حسن	LAB21 Electronics	08:30am - 11:00am	الثلاثاء
المهندس مصطفى محمد كريم, م.د. ستار صبري كريم, م.م. عبدالله فوزي شفيق, م.م. ياسمين كامل نجم	LAB21 DC Machines	11:00am - 01:30pm	
-	-	01:30pm - 02:30pm	
م.د. ماجد هادي طلال	جرائم حزب البعث	08:30am - 10:30am	الأربعاء
د. محمد عبدالرحمن فرج	Calculus III	10:30am - 12:30pm	
-	-	12:30pm - 02:30pm	
م.د. مشتاق نجيب احمد	Electric Circuits I	08:30am - 11:00am	الخميس
م.د. ستار صبري كريم	DC Machines I	11:00am - 01:30pm	
-	-	01:30pm - 02:30pm	

المرحلة: الثانية- شعبة B



اسم التدريسي	اسم المادة	موعد المحاضرة	اليوم
م.د. حامد ردام حسين	Fundamentals of Electronics I	08:30am - 11:00am	الأحد
م.د. زياد طارق إبراهيم	Digital Techniques I	11:00am - 01:30pm	
م.د. احسان احميان صبار	Engineering Mechanics (Static)	01:30pm - 02:30pm	
ا.م.د. احمد عبداللطيف عباس	Electromagnetic Fields I	08:30am - 11:00am	الاثنين
د. محمد عبدالرحمن فرج	Calculus III	11:00am - 01:30pm	
-	-	01:30pm - 02:30pm	
م.د. مشتاق نجيب احمد	Electric Circuits I	08:30am - 11:00am	الثلاثاء
م.د. ستار صبري كريم	DC Machines I	11:00am - 01:30pm	
-	-	01:30pm - 02:30pm	
د. محمد عبدالرحمن فرج	Calculus III	08:30am - 10:30am	الأربعاء
م.د. ماجد هادي طلال	جرائم حزب البعث	10:30am - 12:30pm	
م. عبدالله خالد احمد	English Language II	12:30pm - 02:30pm	
المهندس عمر عبدالله حمود, م. زينب نجيب عبد الحميد, م.د. حامد ردام حسين, م.م. براء سعيد علي, م.م. سامح جسام محمد, م.م. شهد فاضل جابر, م.م. مصطفى لطيف حسن	LAB21 Electronics	08:30am - 11:00am	الخميس
المهندس مصطفى محمد كريم, م.د. ستار صبري كريم, م.م. خالد وليد عبد, م.م. عبدالله فوزي شفيق	LAB21 DC Machines	11:00am - 01:30pm	
-	-	01:30pm - 02:30pm	

• : أسماء التدريسيين المكلفين بتدريس المادة:

1- م.د. ماجد هادي طلال

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Engineering Statistics	Module Delivery	
Module Type	Related	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ENG010		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UG2	Semester of Delivery	4
Administering Department	Electrical	College	College of Engineering
Module Leader	Mohammed A.Faraj	e-mail	Mohammed.Faraj@uoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/SEP/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG08	Semester	3
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	Statistical Engineering models are based on mathematics and probability theory. This course provides students with a working knowledge of fundamental statistics principles and probability in addition to a preface to the regression and correlation analysis. By the end of the semester, students should be able to determine when each of the various topics we have covered is appropriate to use, and to apply them to practical engineering situations or problems. This course will cover techniques on data collection and presentation, descriptive statistics, basic elements of probability theory, sampling techniques and theory, statistical estimation, hypothesis testing and regression analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. use a number of methods and techniques for collecting and presentation the sets of data; 2. calculation and demonstration the center tendency and variation of data; 3. compute the probabilities in a simple case and using the rules of probability in computing; 4. give an account of the concept random variable and be able to use some common probability distributions; 5. understand the meaning of the central limit theorem; 6. use point and interval estimates for some typical statistical problems; 7. • apply elementary regression for fitting measured data.
Indicative Contents المحتويات الإرشادية	<p>Fundamentals (Introduction to Statistics)</p> <ul style="list-style-type: none"> • Introduction • Descriptive and Inferential Statistics • Variables and Types of Data • Data Collection and Sampling Techniques • Observational and Experimental Studies <p>Presentation of a Statistical Data</p> <ul style="list-style-type: none"> • Introduction • Organizing Data • Grouped Frequency Distributions or Frequency Distributions Table • Graphs: Histograms, Frequency Polygons, and Ogive • Other Types of Graphs <p>Data Description</p> <ul style="list-style-type: none"> • Measures of Central Tendency (Mean, Median and Mode) • Measures of Variation <ul style="list-style-type: none"> - 2.1. Population Variance and Standard Deviation - 2.2. Sample Variance and Standard Deviation - 2.3. Variance and Standard Deviation for Tabulated Data - 2.4. Range • Coefficient of Variation <p>Probability and Counting Rules</p> <ul style="list-style-type: none"> • Sample Spaces and Probability • Tree diagram • Basic Probability Rules • Venn Diagram • The Addition Rules for Probability • The Multiplication Rules and Conditional Probability • Conditional Probability

- Counting Rules
 - 8.1. Permutations
 - 8.2. Combinations
- Probability and Counting Rules

- Discrete Probability Distributions
 - Probability Distributions
 - Mean, Variance, Standard Deviation
 - The Binomial Distribution
 - The Poisson Distribution

- Continuous Probability Distributions: The Normal Distribution
 - Normal Distributions
 - Applications of the Normal Distribution
 - Normal Distributions Formula
 - The Standard Normal Distribution
 - Finding Areas Under the Standard Normal Distribution Curve (Table Method)
 - A Normal Distribution Curve as a Probability Distribution Curve
 - Applications of the Normal Distribution
 - Determining Normality
 - The Normal Distribution Approximation to the Binomial Distribution

- Confidence Intervals and Sample Size
 - Preface
 - Confidence Intervals for the Mean When σ is Known
 - 2.1. A point estimate
 - 2.2. An interval estimate
 - 2.3. Confidence Intervals
 - Sample Size
 - t-Distribution
 - Confidence Intervals for the Mean When σ is Unknown
 - The chi-square Distribution
 - Confidence Intervals for Variances and Standard Deviations
 - Confidence Interval for a Variance
 - Confidence Interval for a Standard Deviation

- Hypothesis Testing
 - Preface
 - Steps in Hypothesis Testing—Traditional Method
 - The null hypothesis (H_0)
 - The alternative hypothesis (H_1)
 - The level of significance
 - z Test for a Mean
 - P-Value Method for Hypothesis Testing
 - t Test for a Mean
 - z Test for a Proportion
 - χ^2 Test for a Variance or Standard Deviation

- Testing the Difference Between Two Means, Two Proportions, and Two Variances
 - Preface
 - Testing the Difference Between Two Means: Using the z Test
 - Testing the Difference Between Two Means of Independent Samples: Using the t Test

	<ul style="list-style-type: none"> • Testing the Difference Between Two Means: Dependent Samples • Testing the Difference Between Two Variances <p>Correlation and Regression</p> <ul style="list-style-type: none"> • Preface • Scatter Plots and Correlation • Regression • Coefficient of Determination and Standard Error of the Estimate.
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	47	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	53	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	147		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25% (10)	1,35, 10,11,13	LO# 2, LO# 3and LO# 5
	Assignments	2	5% (5)	2, 12	LO# 3and LO# 5
	Projects / Lab.	1	%5		
	Report	1	5% (5)		
Summative assessment	Midterm Exam	2hr	10% (15)	8	LO# 2 to LO# 4
	Final Exam	3hr	50% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction: basic probability
Week 2	Conditional probability, independent events
Week 3	Principle of counting, permutations, combinations, binomial coefficient
Week 4	Random variables and probability distributions
Week 5	Graphical interpretations, joint distributions
Week 6	Mathematical expectation,
Week 7	Variance and standard deviation,
Week 8	Midterm Exam
Week 9	Correlation coefficient, skewness and kurtosis
Week 10	Percentiles, mean, median, mode
Week 11	Examples
Week 12	Exam
Week 13	Binomial distribution,
Week 14	Normal distribution,
Week 15	Examples
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	

Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> Probability & Statistics for Engineers & Scientists. 9th edition. by Walpole et.al. 	No
Recommended Texts	<ul style="list-style-type: none"> Statistics for Engineers and Scientists. 4th edition. by Navidi Schaum's Outline Probability and Statistics 4th edition. by Spiegel et.al. 	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Calculus IV		Module Delivery	
Module Type	B (Basic learning activities)		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ENG009			
ECTS Credits	6			
SWL (hr/sem)	150 (Student Workload)			
Module Level	2	Semester of Delivery		4
Administering Department	Electrical Engineering	College	College of Engineering	
Module Leader	Abdullah Fawzi Shafeeq		e-mail	abdullah.fawzi@uoanbar.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ms.c	
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	01/09/2025	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG008	Semester	3
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of engineering Mathematics. Specifically, the concepts of all types of differential equations, Laplace transform, inverse Laplace transform, how we solve the differential equation by using Laplace converter, Fourier series, and complex Fourier series.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the course students will be able to: <ul style="list-style-type: none"> Classify differential equations by order, linearity, and homogeneity Solve all type of first order differential equations Solve all type of second order differential equations Determined the Laplace transform Determined the inverse Laplace transform Solve all type differential equations by using Laplace transform Determined the Fourier series for the periodic function
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <ol style="list-style-type: none"> Ordinary differential Equations: Classify differential equations by order, linearity, and homogeneity First order linear differential equations: use separation of variables to solve differential equations, solve exact differential equations, use variation of parameters to solve differential equations, solve first order linear differential equations. Higher order Differential Equations: Solutions of Homogeneous Linear D.E with constant coefficients, Solutions of Inhomogeneous Linear D.E with constant coefficients, The Method of Undetermined Coefficients, Method of Variation of Parameters. Laplace Transform : Determined the Laplace and inverse Laplace transform for all types of function, solve the differential equation by using Laplace transform. Fourier series: Periodic functions, Trigonometric series, Bounds of a Function,

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

The main strategy that will be adopted in delivering this module is to encourage student's 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 some activities that are interesting to the students.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	87	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25% (25)	3,6,9,11, and 13	
	Assignments	2	5% (5)	4 and 12	
	Activities	1	5% (5)	7	
	Report	1	5% (5)	12	
Summative assessment	Midterm Exam	2hr	10% (10)	9	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	Ordinary differential Equations
Week 2	First order linear differential equations
Week 3	First order linear differential equations
Week 4	Second order linear differential equations
Week 5	Second order linear differential equations
Week 6	Higher order Differential Equations
Week 7	MID Exam
Week 8	Laplace Transform
Week 9	Laplace Transform
Week 10	Inverse Laplace Transform
Week 11	Inverse Laplace Transform
Week 12	Solve Differential Equations by using Laplace Transform
Week 13	Solve Differential Equations by using Laplace Transform
Week 14	Fourier Series
Week 15	Fourier Series
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Thomas' Calculus Early Transcendentals 12 th Edition by George B. Thomas Jr. (Author), Maurice D. Weir (Author), Joel R. Hass (Author).	Yes
Recommended Texts	Advanced Engineering Mathematics 10 th Edition by Erwin Kreyszig (Author), Herbert Kreyszig (Author), Edward J. Norminton (Author)	Yes
Websites		

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Computer Science II		Module Delivery	
Module Type	Related		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	UOA008			
ECTS Credits	3			
SWL (hr/sem)	100			
Module Level	UG2	Semester of Delivery		2
Administering Department	Electrical	College	College of Engineering	
Module Leader	Ahmed Jamal Ahmed		e-mail	Ahmed.j.ahmed@uoanbar.edu.iq
Module Leader's Acad. Title	Lecturer	Module Leader's Qualification	Ph.D.	
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Scientific Committee Approval Date	10/01/2026	Version Number	2.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	<ol style="list-style-type: none">1-Utilize the computer for fundamental tasks.2-Identify and discuss the hardware components of the computer system.3-creating documents using word processor and creating presentation.4-Conducting research on the internet.5-An introduction to Artificial Intelligence.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. Analyze, design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.2. Identify problems and formulate solutions for systems.3. Communicate effectively with a range of audience.4. Work effectively as part of a team to develop and deliver quality software artifacts.5. Design solutions using approaches that integrate ethical, social, legal, and economic responsibilities.6. An Introduction to Security and Network.7. An introduction to AI, Applications, Future of AI.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none">- Introduction of Network- Network security- Computers- AI introduction, applications, in our daily lives

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>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.</p>
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25% (25)	3,5,9, 11,13	LO #1, 2, 10 and 11
	Assignments	2	5% (5)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.		6% (4)	Continuous	
	Activities		4% (6)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Security and Network: what is a network? Type of network. Basic network components.
Week 2	Network security basics. Understanding network threats. Network troubleshooting.
Week 3	Lab Network
Week 4	E-Commerce: Concepts of electronic banking services include online banking: ATM and debit card services, phone banking. SMS banking, electronic alert, Mobile banking
Week 5	Computer Troubleshooting: Identifying and solving common hardware and software problems that computer users encounter. Basic troubleshooting techniques and tools for diagnosing and resolving issues
Week 6	Introduction to AI: Definition of AI, History of AI, AI Techniques and approaches, Challenges and Ethical consideration

Week 7	Mid - term Exam
Week 8	AI in our daily lives: AI in smartphones and virtual assistants like Siri or Google Assistant.
Week 9	Lab Computer Hardware and Software
Week 10	Application of AI: Education, Healthcare, Finance, Transportation, Marketing and Advertising.
Week 11	Lab AI applications
Week 12	AI and Society: (how AI affects social, AI and international relations, AI and the future of humanity)
Week 13	Ethical Challenges in AI:(AI Ethics, Privacy and surveillance, the impact of AI on the job market)
Week 14	Lab AI
Week 15	The Future of AI (Future trends in AI, recent research and emerging technologies)
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction of Network
Week 2	Lab 2: Computer Hardware and Software
Week 3	Lab 3: introduction of AI
Week 4	Lab 4: AI Applications
Week 5	Lab 5: AI using Siri and Google Assistant
Week 6	Lab 6: AI challenge
Week 7	Lab 7: Future of AI

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1-Graham Brown, David Watson, "Cambridge IGCSE Information and communication technology", 3 rd edition (2020) 2-Alan Evans, Kendall Martin, Mary Anne Poatsy, "Technology in action complete", 16 th edition(2020). 3-Ahmed Banafa, "Introduction to Artificial Intelligence (AI)", 1 st Edition (2024). 4-الخضرم على الخضرم بحاتم "اساسيات الحاسوب" 2016-4	Yes

	الدكتور عادل عبدالنور, مدخل الى عالم الذكاء الاصطناعي "2005-5	
Recommended Texts		
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	DC Machines II	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE016		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UG2	Semester of Delivery	4
Administering Department	Electrical	College	College of Engineering
Module Leader	Settar Subry Keream	e-mail	Settar.keream@uoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/oct/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE015	Semester	3
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of DC machines. Specifically, the Dc motors, BLDC motors and transformers
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> # Understand the speed control of DC motors, braking and starting of DC motors. # Understand the principle of brushless DC motor . and transformers
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> MOTOR OPERATION: Governing equations, Load: torque and current, Applied voltage, Field excitation, Mechanical characteristic, Stability Speed control: Armature voltage control, Armature resistance control, Field control, Starting: Direct on-line starting, Variable voltage starting, Resistance starting, Starters, Braking: External braking, Electric braking, Applications. Brushless DC motor principle of operation Transformer principle: Single phase transformer, three phase transformers. types of transformer, construction, no-load and short circuit tests and efficiency

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

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	LO# 1and LO# 2
	Assignments	2	5% (5)	2, 12	LO# 1and LO# 2
	Projects / Lab.	1	10% (10)		LO# 1and LO# 2
	Report	1			LO# 1and LO# 2
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO# 1and LO# 2
	Final Exam	3hr	60% (60)	16	LO# 1and LO# 2
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	MOTOR OPERATION: Governing equations, Load: torque and current,
Week 2	Applied voltage, Field excitation, Mechanical characteristic, Stability
Week 3	Speed control: Armature voltage control, Armature resistance control, Field control,
Week 4	Midterm Exam
Week 5	Starting: Direct on-line starting, Variable voltage starting,
Week 6	Resistance starting, Starters,
Week 7	Braking: External braking,
Week 8	Electric braking,
Week 9	Applications.
Week 10	Brushless DC motor principle of operation,
Week 11	construction Applications
Week 12	Transformer principle: Single phase transformer, Transformer-types of transformer, construction, no-load and short circuit tests.
Week 13	losses in transformers, the equivalent circuit of the transformer, efficiency, regulation, auto-transformer.
Week 14	Three phase transformers, Efficiency and maximum efficiency condition of transformer.
Week 15	Parallel operation of transformer.
Week 16	Final Exam

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

Week 1	LAB1: Connection & rotation direction of DC shunt wound machines operating as motor
Week 2	LAB2: Speed control of a DC shunt motor
Week 3	LAB3: Load characteristic of separately – excited shunt – wound DC motor
Week 4	LAB4: Connection & rotation direction of DC series wound machines operating as motor
Week 5	LAB5: Load characteristic of series – wound DC moto
Week 6	LAB6: Load characteristic of Shunt and compound DC moto
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Theraja and Theraja (A Textbook of Electrical Technology) volume I basic electrical engineering in S.I. System of units revised by: Tarnekar Chand an ISO 9001:2000 company Chand & company Ltd. Ram Nagar (2005)	yes
Recommended Texts		
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Electric Circuits II	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE004		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UG2	Semester of Delivery	4
Administering Department	Electrical	College	College of Engineering
Module Leader	Mushtaq Najeeb Ahmed	e-mail	mushtaq.najeeb@uoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	1/Feb/2026	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE003	Semester	3
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course is a second course on electric circuits. The focus of the course is to impart useful skills on the students to enhance their circuit analysis capability. Hence, the course is designed to provide students with a knowledge on circuit analysis by Introducing the topic and illustrating its importance for electrical engineering field: Laplace transform and relation between current and voltage for resistance, capacitance and inductance, Laplace transform and its applications in electric circuit the concept of magnetic coupling, Analysis of magnetic coupled circuits, Linear transformers, Ideal transformers. Two-port networks and its different equation forms, Evaluation of its parameter, Interconnected two-port networks, Frequency response. High-pass, low-pass, Band pass, and Band-stop filters. Revision and a set of solved examples.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ul style="list-style-type: none"> ● Laplace Transform Analysis of Circuits: ● The Laplace transform and its inverse. Properties: multiplication-convolution, differentiation, initial and final value theorems. Application of Laplace in Circuits in the s-domain: transfer function, impedance, circuit reduction, initial conditions. ● Mutual Inductance and Transformers: Mutual inductance. Coupling coefficient. Analysis of coupled coils. Dot rule. Energy in a pair of coupled coils. Conductively coupled equivalent circuits. Linear transformer. Ideal transformer. ● Autotransformer. Reflected impedance. ● Frequency Response, Filters ● Frequency response. High-pass and low-pass networks. Half-power frequencies. Band-pass filters and Band-stop filters. ● Two-Port Networks ● Terminals and ports, z-parameters. t-equivalent of reciprocal networks. y-parameters. ● Conversion between z and y parameters. h and g parameters. Transmission parameters. Interconnecting two-port networks.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> ● Understand the basic properties of Laplace transform and its application to electric circuits. ● Analyze electrical networks using complex frequency approach and Laplace transform. ● Apply such approaches to magnetically coupled circuits and two port networks.

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

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	63	Structured SWL (h/w)	4.133

الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعيا	
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	37	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.2
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25%		LO# 2, LO# 5 and LO# 9
	Assignments	1	5 %		LO# 6 and LO# 8
	Activities	1	5 %		LO# 4, LO5 5 and LO# 6
	Report	1	5 %		LO# 7
Summative assessment	Midterm Exam	1hr	10 %		LO#1 to LO# 7
	Final Exam	3hr	50 %		all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction to Magnetically Coupled Circuits and Mutual Inductance
Week 2	Energy in a Coupled Circuit
Week 3	Explanation of Linear Transformer
Week 4	Concept of Ideal Transformer
Week 5	Concept of Ideal Autotransformer and Three-Phase Transformers
Week 6	Concept of Series and Parallel Resonance
Week 7	Passive Filters (Lowpass, Highpass, Bandpass, and Bandstop)
Week 8	Active Filters (Lowpass, Highpass, Bandpass, and Bandreject)
Week 9	Introduction to Laplace Transform and Its Properties
Week 10	Inverse Laplace Transform
Week 11	Circuit Element Models (Laplace Transform Applications)
Week 12	Circuit Analysis and Transfer Functions (Laplace Transform Applications)
Week 13	Tow-port Networks (Impedance Parameters)
Week 14	Tow-port Networks (Admittance Parameters)
Week 15	Tow-port Networks (Transmission Parameters)
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	

Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Charles K. Alexander, Matthew N. O. Sadiku "Fundamentals of Electric Circuits" Fifth edition.	No
Recommended Texts	James W. Nilsson, Susan A. Riedel "Electric Circuits" Ninth edition	No
Websites		

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

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MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Electromagnetic Fields II	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE006		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UG2		
Administering Department	Electrical	College	College of Engineering
Module Leader	Ahmed A. Abbas	e-mail	Ahmed.abbas@uoanbar.edu.iq
Module Leader's Acad. Title	Assist. prof. Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/nov/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE005	Semester	3
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course is designed for students to understand current and conductors dielectrics and capacitance, Poisson's and Laplace's equations, the steady magnetic field, Magnetic forces, materials and inductance, Time-varying fields and Maxwell's equations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Understand the current and current density and continuity of current. 2. Understand the metallic conductor, conductor properties and boundary conditions and semiconductor. 3. Understand the dielectric materials and capacitance. 4. Understand the relationship between the potential and electric fields. 5. Use Laplace and Poisson equations to find potential fields within regions bounded by the charge density. 6. Understand the steady magnetic field. 7. Understand the magnetic force, materials and inductance. 8. Understand the time-varying field and Maxwell equations
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> • The current and current density and continuity of current. • The metallic conductor, conductor properties and boundary conditions and semiconductor. • The dielectric materials and capacitance. • The relationship between the potential and electric fields. • Laplace and Poisson equations to find potential fields within regions bounded by the charge density. • The steady magnetic field. • The magnetic force, materials and inductance. • The time-varying field and Maxwell equations

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

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	47	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	78	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	LO# 2, LO# 4 and LO# 7
	Assignments	2	5% (5)	2, 12	LO# 3 and LO# 4
	Projects / Lab.	1	10% (10)		
	Report	1			
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO# 3 to LO# 6
	Final Exam	3hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Current and current density, continuity of current, metallic conductors,
Week 2	Conductor properties and boundary conditions, semiconductors.
Week 3	The nature of dielectric materials, boundary conditions for perfect dielectric materials.
Week 4	Boundary conditions for perfect dielectric materials, capacitance.
Week 5	Poisson and Laplace equations, derivation of Poisson and Laplace equations, examples of solution of Poisson and Laplace equations.
Week 6	Biot- Savart law.
Week 7	Ampere law, curl.
Week 8	Midterm Exam
Week 9	Stokes theorem, magnetic flux and magnetic flux density.
Week 10	The scalar and vector magnetic potentials.
Week 11	Derivation of the steady –magnetic field laws, force on moving charge, force on differential current element.
Week 12	Force between differential current element, force and torque on a closed circuit.
Week 13	The nature of magnetic materials, magnetic boundary conditions, the magnetic circuit, potential energy and forces on magnetic materials.
Week 14	Faraday law, displacement current.
Week 15	Maxwell equation in point form, Maxwell equation in integral form, the retarded potentials.
Week 16	Final Exam

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	William H. Hayt, Jr and Jone A. Buck "Engineering Electromagnetics" 6th Edition.	Yes
Recommended Texts		
Websites		

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Fundamentals of Electronics II		
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE08		
ECTS Credits	4		
SWL (hr/sem)	125		
Module Level	2	Semester of Delivery	4
Administering Department	Electrical	College	College of Engineering
Module Leader	Hamid raddam	e-mail	hamid.radam@uoanbar.edu.iq
Module Leader's Acad. Title	M _{Sc}	Module Leader's Qualification	Master
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/oct/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE07	Semester	3
Co-requisites module	None	Semester	None

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	The goals of this course are to enable students to: 1) Explanation of the physical structure of the semiconductors in AC domain. 2) AC Analysis of a pn diode operation, description of the device characteristics 3) Investigation of diode circuits and applications 4) AC Analysis of a BJT, description of device characteristics 5) Construction and DC biasing circuits of JFET and MOSFET . 6) AC Analysis and small signals Circuits of JFET's and MOSFET's.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. After successfully completing the course, the students will be able to: 2. Apply mathematics, , and engineering to the analyze and design electronic circuits 3. Identify, formulate, and solve engineering problems in the area circuits and systems. 4. Identify and characterize different semiconductor devices (P-N Junction, JFET, and MOSFET) 5. Understand different type of diode and JFET transistor applications. 6. Perform a DC and small Signal analysis of JFET, MOSFET, and MESFET networks. 7. Analyze and design different electronic circuits contain semiconductors using devices' models. 8. Understand the design parameters and different characteristics of small signal amplifiers.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> • Introduction to Electronic devices and systems in AC domain. • Construction and analysis of pn Diodes, BJT, FET and other Devices. • Characteristics and operation Principals of Electronics Devices. • Practical applications of pn Diodes, BJT, FET and others Devices. • AC Biasing and analysis of electronic circuits.

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

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3.2
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	LO# 2, LO# 5 and LO# 7
	Assignments	2	5% (5)	2, 12	LO# 5 and LO# 6
	Projects / Lab.	1	10% (10)		LO# 4, LO#5 and LO# 6
	Report	1			LO# 6
Summative assessment	Midterm Exam	2hr	15% (15)	8	LO#1 to LO# 6
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Semiconductor Diodes (Logic Circuits)
Week 2	Semiconductor Diodes (Logic Circuits)
Week 3	Diode AC Applications
Week 4	Diode AC Applications
Week 5	Diode AC Applications
Week 6	BJT Transistor Modeling
Week 7	BJT Small – Signal Analysis
Week 8	BJT Small – Signal Analysis
Week 9	BJT Small – Signal Analysis
Week 10	FET Small – Signal Analysis
Week 11	Deplation – Type MOSFETs
Week 12	Enhancement – Type MOSFETs
Week 13	MOSFETs Transistor Application
Week 14	Small Signal Analysis of Field- Effect Transistor
Week 15	Small Signal Analysis of Field- Effect Transistor
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	electronics II lab:1 - Characteristics of Bipolar Junction
Week 2	electronics II lab:2 - Transistor DC Biasing Circuits

Week 3	electronics II lab:3- Logic Gate Circuits
Week 4	electronics II lab:4- Small Signal BJT Amplifier
Week 5	electronics II lab:5- JFET Characteristics
Week 6	electronics II lab:6- The FET Common Source Amplifier
Week 7	

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• Robert L. Boylestad and Louis Nashelsky, "Electronic Devices and Circuit Theory", 11th edition, Pearson, 2013.	No
Recommended Texts	• Robert L. Boylestad and Louis Nashelsky, "Electronic Devices and Circuit Theory", 10th edition, Pearson, 2013.	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Analog Communications and Noise		Module Delivery
Module Type	C	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE013		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UG3		
Administering Department	Electrical	College	College of Engineering
Module Leader	Mohammed Ali Hussein	e-mail	Mohammed.almahamdy@uoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/sep/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE011	Semester	
Co-requisites module		Semester	5

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of communication system engineering. Specifically, the analog communication systems (AM and FM). The noise within the communication systems is also introduced.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand and analyze communication systems in both the time and frequency domains. 2- Understand the principles of amplitude and frequency modulations. 3- Understand the sources of the electrical noise and its roles on the communications.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> • Introduction to communication system, channel, waves propagation. • Amplitude Modulation: DSB-SC, DSB-LC, SSB, VSB. • FDM • Frequency Conversion, Super-Heterodyne Receiver • Frequency Modulation: power, bandwidth, generation, detection. • Introduction to the noise in communication systems. Noise Sources, Thermal Noise, White & Filtered Noise, Equivalent Temperature. • Noise & SNR in selected studied systems.

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

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	1
	Assignments	2	5% (5)	2, 12	2,3
	Projects / Lab.				1,2
	Report	1	5% (5)		3
Summative assessment	Midterm Exam	2hr	20% (15)	8	1,2,3
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction to Communication System, Channel; Signal Classification and Characteristics
Week 2	Introduction to Waves Propagation, Multipath
Week 3	Introduction to Fourier Transform, Filters & Bandwidth
Week 4	Amplitude Modulation Systems, AM-DSB-SC (Modulation/Demodulation)
Week 5	AM-DSB-LC (Modulation-Demodulation)
Week 6	AM-SSB & AM-VSB (Modulation-Demodulation)
Week 7	FDM, Frequency Conversion, Super-Heterodyne Receiver
Week 8	Midterm Exam
Week 9	FM: Introduction, NBFM, WBFM
Week 10	Spectrum Plotting Using Bessel Function, Power in FM
Week 11	FM Generation: Direct (VCO) and Indirect Method (Armstrong)
Week 12	FM Detection: Discriminator, Zero Crossing Detector, PLL
Week 13	Introduction, Noise Sources, Mathematical Representation of Noise, Noise Figure
Week 14	Thermal Noise, White & Filtered Noise, Equivalent Temperature, Noise in Multistage System
Week 15	Noise & SNR in: AM and FM.
Week 16	Final Exam

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• Lathi, and Ding. "Modern Digital and Analog Communication Systems", 2010.	No
Recommended Texts	• Proakis, and Salehi. "Communication Systems Engineering". 2002.	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	AC Machines I		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ELE017		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UG3	Semester of Delivery	5
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name Dr. Omar Kamil Dahham	e-mail	E-mail: omar.dahham@uoanbar.edu.iq
Module Leader's Acad. Title	lectuer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/09/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE004; ELE016	Semester	1,4
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	<ol style="list-style-type: none">1. This course is designed to enable the students to understand the AC machines. especially induction motors to the standard required at department level.2. The course integrates Introduction of AC machines construction and operation principle for students of the third year in electrical engineering department.3. Students, in this course, will deals with single phase induction machine, equivalent circuit, three phase induction machines etc.4. Theoretical preparation of students to work in the field of electrical machine design, operation, fault detection and control.5. Applying numerical method to solve industrial problem.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. Knowledge of AC machines type in general.2. Deals with single phase induction machine3. Deals with three phase induction machines etc.4. Theoretical preparation of students to work in the field of electrical machine design, operation, fault detection and control.5. Applying numerical method to solve industrial problem
Indicative Contents المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>Introduction of electromagnetic field and design electrical machine. (12 hours)</p> <p>Single phase induction motor. Main and auxiliary windings the doubt revolving field theory. The equivalent circuit-performance calculations. (12 hours)</p> <p>Three phase induction motors-3-phase. AC winding-the rotating electromagnetic field. The equivalent circuit performance. (6 hours)</p> <p>Open circuit and short circuit tests of three phase induction motor, efficiency calculations. Torque speed curve and torque characteristics. (6 hours)</p> <p>Starting of induction machine. Speed control of induction motors. Other modes of operation-starting. (6 hours)</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in the delivery of this unit is to encourage students to participate in the exercises, while improving and expanding their critical thinking skills at the same time. This will be achieved through classes and interactive educational programs and by thinking about the type of simple experiments that include some theoretical and practical activities that include calculating some important values and selection methods for different types of motors and using theoretical information to identify and predict malfunctions that occur to motors in work sites
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	77	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of Electromagnetic Field
Week 2	Design Electrical Machine
Week 3	Single Phase Induction Motor
Week 4	Main and Auxiliary Windings the Doubt Revolving Field Theory
Week 5	The Equivalent Circuit-Performance Calculations.
Week 6	Three Phase Induction Motors-3-Phase
Week 7	Ac Winding-The Rotating Electromagnetic Field
Week 8	The Equivalent Circuit Performance,
Week 9	The Equivalent Circuit Performance,
Week 10	Torque Speed Curve and Torque Characteristics
Week 11	Torque Speed Curve and Torque Characteristics
Week 12	Torque Speed Curve and Torque Characteristics
Week 13	Starting of Induction Machine,
Week 14	Speed Control of Induction Motors
Week 15	Other Modes of Operation-Starting
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction of Electrical Machines.
Week 2	Lab 2: Introduction of Lab. Parts and Equipment
Week 3	Lab 3: Characteristics of The Single-Phase Induction Motor
Week 4	Lab 4: Starting of Single-Phase Induction Motor
Week 5	Lab 5: Laboratory Exam
Week 6	Lab 6: Introduction of Three Phase Induction Motors-3-Phase
Week 7	Lab 7: Connection and Rotational Direction of Three Phase Induction Motor.

Week 8	Lab 8: Torque Speed Curve and Torque Characteristics
Week 9	Lab 9: Efficiency, Current and Power Factor of Three Phase Induction Motor.
Week 10	Lab 10: No load and short circuit test of three phase induction motor
Week 11	Lab 11: mid. Exam
Week 12	Lab 12: Connection & Rotational Direction and Optimum Starting Resistance Test of Three Phase Induction Motor Fitted with Slip Ring Rotor.
Week 13	Lab 13: Characteristics of Three Phase Induction Motor Fitted with Slip Ring Rotor.
Week 14	Lab 14: Laboratory Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	B.L Thiraja, A.K Thiraja, " A text book of electrical technology, volume II	Yes
Recommended Texts	Chapman "Electric Machinery Fundamental", Fourth Edition	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Arabic Language II		Module Delivery
Module Type	S		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar
Module Code	UOA002		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UG3	Semester of Delivery	
Administering Department	Electrical Engineering	College	Engineering
Module Leader	Muanna W Naji	e-mail	muanna.naji@uoanbar.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	02/10/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	<p>This course aims to build students' knowledge and competence in the Arabic language, rhetoric, and Arabic literature of all kinds, to increase their ability to appreciate literature and develop their awareness of its concepts through the study of poetry, novels, and short stories. story.</p> <p>C- thinking skills:</p> <ol style="list-style-type: none">1. Work on developing the intellectual property of the student.2. Ensuring the personal development of the student at the academic level.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. Develop academic essay writing proficiency2. Apply reading skills3. Expand academic vocabulary through reading4. Improve critical thinking skills5. Developing the student's intellectual property in the field of the Arabic language, to acquire verbal and actual ability and skill.
Indicative Contents المحتويات الإرشادية	<p>Study of the Holy Qur'an and analysis of its language, spelling, and grammar. [Two hours]</p> <p>Study of a text from the Prophet's Hadith and explain its rules and meanings. [Two hours]</p> <p>Rules for writing hamzas, writing Arabic literally, and numbers and numerical attributes. [Four hours]</p> <p>Punctuation. [Two hours]</p> <p>Dictionaries: A method for identifying words in Arabic dictionaries. [Two hours]</p> <p>Applications of grammar and language, including: the subject and its deputy. [Two hours]</p> <p>Intransitive verbs, the state, and exception. [Two hours]</p> <p>Ancient literary studies, defining literature and its importance, eras of historical Arabic literature - modern literary studies, studying texts of poetic eras (pre-Islamic, Islamic, Umayyad, Abbasid, Andalusian), studying ancient prose texts (sermons, letters), studying modern and contemporary poetry, studying modern prose texts (plays, novels, essays). [Six hours]</p> <p>Study of rhetoric. [Four hours] Language skills, common language mistakes [Four hours]</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33 students' line importance	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25% (25)	3,7, 10	LO #4, 6, 8 and 10
	Assignments	2	5% (6)	7	LO # 2
	Projects / Lab.	0			
	Report	1	10% (10)	13	LO # 5, 7 and 13
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The Holy Qur'an/ 1. From Surah Al-Isra'/ Verses (23-29). 2. From Surah Yusuf/ Verses (1-7).
Week 2	The Noble Prophetic Hadith / From the Noble Prophetic Hadith: 1. The Messenger of Allah, peace be upon him and his family: "Indeed, Allah loves that when any one of you does a job, he perfects it." 2. "Do not envy one another, do not artificially raise prices, and do not hate one another..." (The full hadith on the morals of the Muslim).
Week 3	Arabic Literature/ 1. Verses from al-Sharif al-Radi's poem lamenting his mother. 2. Abu al-Ala al-Ma'arri's Daliyah:
Week 4	Arabic Literature/ 1. Verses by each of: Al-Jawahiri, Al-Sayyab. 2. Verses from Al-Mu'ammiyya of Al-Mutanabbi:
Week 5	Arabic Grammar/ 1. The Present Tense Verb (Accusative and Jussive). 2. The Genitives.
Week 6	Arabic Grammar: 3. The Accusative Cases. 4. Number and its Rules.
Week 7	Mid-term Exam
Week 8	Provisions for writing the open and tied tā'. Provisions for writing the extended and restricted alif.
Week 9	Writing of Ḍād and Zā'.
Week 10	Stages of Language Collection. Dictionaries of Words and Meaning. The Method of My School . And Practice in Extracting Words.
Week 11	❖ The Science of Rhetoric and Its Impact on the Eloquence of Speech
Week 12	Moral devices (pun, antithesis, contrast, good reasoning, emphasizing praise with something resembling blame).
Week 13	(Pun, rhyme, quotation, inclusion).
Week 14	Declension of nouns in terms of: masculinity and femininity, simple and augmented forms, singular, dual, and plural.
Week 15	Common linguistic errors. Some linguistic differences
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Lectures in the Arabic language.	Yes
Recommended Texts	<ul style="list-style-type: none"> ❖ Meanings of grammar / Prof. Dr. Fadel Al-Samarrai ❖ Arabic language lessons collection / written by Mustafa Al-Ghailani. ❖ Clarification in the Sciences of Rhetoric / Al-Khatib Al-Qazwini. ❖ Linguistic differences / Abu Hilal Al-Askari. 	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Computer Networks III	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE020		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UG3		
Administering Department	Electrical	College	College of Engineering
Module Leader	Ahmed Shakir Abdullah	e-mail	Ahmed.s.abd@uoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	10/oct/2025	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	<ol style="list-style-type: none"> 1. This course deals with the basic concept of data communications. 2. To understand the layered architecture of communication protocols 3. To learn digital signal transmission and encoding techniques. 4. To understand multiplexing techniques. 5. This course deals with concepts and techniques in error detection and correction. 6. To understand LAN architectures and systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Describe the general principles of data communication. 2. Describe how signals are used to transfer data between nodes. 3. Describe how packets in the Internet are delivered. 4. Explain the concept of dividing a job into layered tasks, the functions of the various layers of the OSI Mode. 5. Explain the basics of TCP/IP model, functions of the different layers and protocols involved, addressing mechanisms used under the TCP/IP, IPv4 and importantly IP address and IP header format. 6. Define the transmission medium and its types, understand various network strategies and topologies. 7. Describe how routing protocols work. 8. Design and implement a network protocol. 9. Explain multiplexing techniques. 10. Explain network security and cryptography. 11. Discuss the internet elements and their applications.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> • Network communications, and data networking. • Data transmission: concepts and terminology. transmission media. • Signal encoding techniques, and digital data communications techniques. • Network topologies, network types, computer communications networks. • LAN protocol architecture, topologies and transmission media. • Wireless LAN Technology, IEEE 802.11 architecture and services, physical layer. • OSI reference model and its layers, physical layer. • Data link control protocols. Network layer. • TCP / IP and its layers. • Internetwork protocols. • Circuit switching and packet switching. • Routing in switched networks. • Transport protocols. • Network security and cryptography. • Internet applications: electronic mail and network management, internet directory service and World Wide Web.

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

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	47	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	3.1
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	53	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3.5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
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	10% (10)	2, 12	LO # 3, 4, 6 and 7
Summative assessment	Midterm Exam	2hr	20% (15)	7	LO # 1-7
	Final Exam	2hr	60% (60)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction to data communications and networking
Week 2	Data transmission: Data, signals, transmission impairments & their parameters
Week 3	Signal encoding techniques: (digital data, digital signals), (digital data, Analog signals), & (analog data, analog signals).
Week 4	Network topologies, network types, & computer communication networks.
Week 5	Transmission media: Introduction, guided media, applications, optical fiber, unguided media, wireless channels, & satellite microwave.
Week 6	Wireless LANs: Wireless LAN Technology, IEEE 802.11 Architecture and Services, IEEE 802.11 Medium Access Control, & IEEE 802.11 Physical Layer.
Week 7	Introduction, OSI model with its layers and physical layers
Week 8	Midterm Exam
Week 9	Data Link Control & Protocols Data Link Layer: Framing, character-oriented protocols, bit-oriented protocols, flow and error control & protocols.
Week 10	Introduction, TCP/IP model & its layers
Week 11	Switching networks: Circuit switching, packet switching, message switching, virtual circuit, cell switching, & ATM virtual connections.
Week 12	Routing: Introduction, Path determination & routing algorithms
Week 13	Multiplexing: Frequency division multiplexing, synchronous time division multiplexing, statistical time division multiplexing, & digital subscriber line
Week 14	Network security: Introduction, security architecture, security attacks, & achieving network security.
Week 15	Internet applications: electronic mail and network management, internet directory service & World Wide Web.
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> Behrouz A. Forouzan, "data communications and networking" 4th ed., 2007, Mc Graw Hill. 	Yes
Recommended Texts	<ul style="list-style-type: none"> William Stallings "Data and computer communications" 8th edition, 2007, Pearson Education, Inc. 	Yes
Websites	<ol style="list-style-type: none"> http://eti2506.elimu.net/Introduction/Books/Data%20Communications%20and%20Networking%20By%20Behrouz%20A.Forouzan.pdf https://memberfiles.freewebs.com/00/88/103568800/documents/Data.And.Computer.Communications.8e.WilliamStallings.pdf 	

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Electric Power I		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ELE21		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UG3	Semester of Delivery	
Administering Department	Electrical	College	College of Engineering
Module Leader	Mushtaq Najeeb Ahmed		e-mail
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	1/Oct/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE04		Semester
			4
Co-requisites module			Semester

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course is designed to introduce elements of power system, generation unit, thermal plants, Hydro plants, Steam plants, nuclear plants. Explain principle of Load factor, capacity factor, transmission line constants, resistance, inductance, single phase two wire, three phase, symmetrical distance, unsymmetrical distance, flat arrangement, horizontal arrangement, hexagonal arrangement. Give an overview of Capacitance, single phase two wire, three phase, symmetrical distance, unsymmetrical distance, flat arrangement, horizontal arrangement, earth effect. Performance design of T.L, short T.L, equivalent circuit, voltage regulation, phasor diagram, Medium T.L, equivalent circuit, voltage regulation, phasor diagram, T model, pi model, Long T.L, equivalent circuit, voltage regulation, phasor diagram.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Energy resources, various types of power stations, 2. Load factor and capacity factor. 3. Constants of transmission line. 4. Symmetrical and unsymmetrical distance. 5. Flat, horizontal, and hexagonal arrangements. 6. Three phase, symmetrical distance, and unsymmetrical distance. 7. Performance of transmission line. 8. Short transmission line. 9. Medium transmission line. 10. Long transmission line.
Indicative Contents المحتويات الإرشادية	<ol style="list-style-type: none"> 1. Explain the basic concept of power generation. 2. Explain the electrical power generations methods. 3. Understand the electrical design of transmission line. 4. Design a transmission line system by applying mathematical methods.

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

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4.133
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.2
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation					
تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25%		1,8
	Assignments	1	5 %		2,3
	Activities	1	5 %		4.5
	Report	1	5 %		6,7
Summative assessment	Midterm Exam	1hr	10 %		1,2,4,7
	Final Exam	3hr	50 %		all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	General Background
Week 2	Power Stations (Steam, Hydro-electric, and Diesel)
Week 3	Variable Load on Power Station
Week 4	Variable Load on Power Station
Week 5	Constants of T.L (Resistance and Inductance derivation due to internal and external fluxes)
Week 6	Constants of T.L (Resistance and Inductance derivation due to internal and external fluxes)
Week 7	Inductance of (single-phase, one conductor in a group, and composite conductor)
Week 8	Inductance of (single-phase, one conductor in a group, and composite conductor)
Week 9	Inductance of 3-phase Line Symmetrical and Unsymmetrical Spacing
Week 10	Inductance of (Bundled Conductors and Parallel-circuit 3-phase lines)
Week 11	Capacitance of Transmission Line (single-phase and three-phase with symmetrical spacing)
Week 12	Capacitance of 3-phase with unsymmetrical spacing, bundle conductors, and effect of earth on capacitance
Week 13	Equivalent Circuit of Short Transmission Line
Week 14	Equivalent Circuit of Medium Transmission Line (Nominal T method)
Week 15	Equivalent Circuit of Medium Transmission Line (Nominal pi method)
Week 16	Final Exam

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	W. Stevenson, element of power system analysis, McGraw- Hill Pub., 2005.	No
Recommended Texts	Principles of power system, V.K Mehta, S. Chand & company Ltd., 2004.	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Electronic I		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ELE009		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UG3	Semester of Delivery	
Administering Department	Electrical	College	College of Engineering
Module Leader	Omar Khaldoon Adulrahman		e-mail okabdulrahman@uoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/nov/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE004	Semester	4
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces Multistage and compound Configurations , Log and antilog amplifiers, Amplifier frequency response, Differential amplifier , Application to CMOS and BIMOS circuits , Operational amplifier Characteristics , Op -Amp applications : Constant-Gain Multiplier, Voltage Summing, Voltage Buffer, Controlled Sources, Comparator , Active Filters.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand and analyze the Amplifiers and power amplifier in both the time and frequency domains. 2- Understand the principles of operational amplifier, and application. 3- Understand the Active filter.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> • Amplifier Frequency Response. • Multistage Frequency Effects. • Differential Amplifier Circuits, BIMOS and CMOS Differential Amplifier circuits . • Operational Amplifier (op-amp) Circuits: • Op-Amp Specifications – DC offset parameters and Frequency parameters. • Differential and common – mode operation. • Op-Amp Applications • Controlled Sources, Instrumentation Circuits. • Active Filters

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

Student Workload (SWL) الحمل الدراسي للطلاب					
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل		77	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً		5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل		48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً		3
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل		125			
Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	1
	Assignments	2	5% (5)	2, 12	2
	Projects / Lab.	1	10% (10)		3
	Report	1			1
Summative assessment	Midterm Exam	2hr	15% (15)	8	2
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Amplifier Frequency Response, log , and Antilog
Week 2	Low-Frequency Response—BJT Amplifier.
Week 3	Low-Frequency Response— JFET Amplifier
Week 4	High-Frequency Response—BJT Amplifier
Week 5	High-Frequency Response—JFET Amplifier.
Week 6	Multistage Frequency Effects
Week 7	Differential Amplifier Circuits, BIMOS and CMOS Differential Amplifier circuits .
Week 8	Operational Amplifiers Basics.
Week 9	Operational Amplifier (op-amp) Circuits: Inverting and non-Inverting amplifier, , Summing amplifier, Integrator and Differentiator.
Week 10	Op-Amp Specifications – DC offset parameters and Frequency parameters.
Week 11	Differential and common – mode operation
Week 12	Op-Amp Applications: Multiple – stage gains, Voltage Subtraction, Voltage Buffer.
Week 13	Controlled Sources, Instrumentation Circuits.
Week 14	Voltage Comparator
Week 15	Active Filters: low – pass filter, High – pass filter and Band pass filter.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	CE Amplifier – Setting up the Rest Point (part 1)
Week 2	CE Amplifier – Setting up the Rest Point (part 2)
Week 3	CE Amplifier – R_i measurements
Week 4	CE Amplifier – R_o measurements
Week 5	Frequency response of C.E. Amplifier (part 1)
Week 6	Frequency response of C.E. Amplifier (part 2)
Week 7	Multistage Amplifiers (part 1)
Week 8	Multistage Amplifiers (part 2)
Week 9	Operational Amplifiers. Inverting characteristics
Week 10	Operational Amplifiers. Non-Inverting characteristics
Week 11	Differential amplifiers

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	R. Boylestad and L. Nashelsky, "Electronic Devices and Circuit Theory", 11th edition , 2013	No
Recommended Texts	Electronic devices : electron flow version / Thomas L. Floyd.— 9th edition.	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Signals and Systems I	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE011		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	3	Semester of Delivery	5
Administering Department	Electrical	College	College of Engineering
Module Leader	Adnan Salih Suhail	e-mail	adnansaheluoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/oct/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ENG009	Semester	4
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of the continuous signals and systems. It studies the linear time-invariant (LTI) systems and their impulse response, convolution. The Fourier transform, and series of continuous signals. The course teaches the frequency response and its applications in the electrical systems and signals communication.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Understand the basic types of analog signals and systems. 2-Understand the causality and stability of continuous LTI systems. 3-Understand and deploy the Fourier transform/series of continuous-time signals and Systems in the electrical engineering.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> • Introduction to C.T system, impulse response, and convolution. • Classification of system. • types of signals, and classification of signals. • Frequency response of LTI system, • system function and transfer function using Laplace Transform. • Block diagram characterization of LTI system. • solution of system differential equation using LT.

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

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	150	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	10
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	88	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	238		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	8% (8)	5, 10	1
	Assignments	2	5% (5)	3, 11	2
	Projects	1	5% (5)		3
					2
Summative assessment	Midterm Exam	2hr/2	20% (22)	8, 14	3,2
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction to signals and Definition of Signals & Systems
Week 2	Classification of Signals
Week 3	Operations on signals
Week 4	Properties of linear system
Week 5	Analysis of responses, and convolution
Week 6	Representation of Fourier Series
Week 7	Properties of Fourier series, Trigonometric Fourier Series
Week 8	Midterm Exam
Week 9	Fourier Transform, Properties of Fourier Transforms
Week 10	LTI-System Function & Impulse Function
Week 11	block diagram representation of a LTI continuous-time system described by a differential equation.
Week 12	characterize LTI CT systems in the time domain using impulse response and differential equations.
Week 13	use the transfer function of a LTI CT system and the inverse Laplace-transform to obtain the system output.
Week 14	Midterm Exam
Week 15	The Frequency Response of Continuous Time LTI Systems
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	#Oppenheim; Willsky; Hamid; "Signals and Systems" 2nd ed.	No
Recommended Texts	#Hsu; "Schaum's Outline of Signals and Systems" 3ed.	No
Websites	https://www.tutorialspoint.com/signals_and_systems	

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Digital Communications	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE014		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UG3	Semester of Delivery	6
Administering Department	Electrical	College	College of Engineering
Module Leader	Mohammed Ali Hussein	e-mail	Mohammed.almahamdy@uoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/oct/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE013	Semester	5
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of the digital communication systems. It discusses different techniques of transmitting analog signals in form of discrete/binary signals. Different carrier modulation methods of the binary data are presented.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Understand the principles of sampling and encoding of analog signals. 2. Understand the TDM. 3. Understand the principles of digital modulation.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> • The sampling theory, Nyquist sampling and aliasing in reconstruction. • PCM. • Delta PCM, Deferential PCM, Delta Modulation. • PAM-TDM, PCM-TDM, ISI & Eye Diagram. • M-ary baseband signaling. • Digital modulation: BASK, BFSK, BPSK. • M-ary Modulation, QPSK, QAM.

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

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3.2
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	202		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	1
	Assignments	2	5% (5)	2, 12	2
	Projects / Lab.	1	10% (10)		3
	Report	1			2
Summative assessment	Midterm Exam	2hr	15% (15)	8	1,2
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	The Sampling Theory, Nyquist Sampling Rate & Aliasing in Reconstruction
Week 2	PCM
Week 3	Examples & Problems
Week 4	Non-Uniform Quantization, SNR in PCM
Week 5	Delta PCM, Deferential PCM, DM Systems, Noise in DM, Adaptive DM
Week 6	PAM-TDM, Crosstalk and Guard Times, PCM-TDM, ISI & Eye Diagram
Week 7	Channel Capacity, Multi-Level Baseband Signaling (M-ary)
Week 8	Midterm Exam
Week 9	Probability of Error at Reception
Week 10	Examples & Problems
Week 11	Introduction Digital Modulation, BASK
Week 12	BFSK
Week 13	BPSK
Week 14	M-ary Modulation, QPSK
Week 15	QAM
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	LAB1: RF oscillators
Week 2	LAB2: 2nd order filter
Week 3	LAB3: AM-DSB-LC Modulation
Week 4	LAB4: Frequency Modulation
Week 5	LAB5: PCM
Week 6	LAB6: PWM
Week 7	LAB7: ASK
Week 8	LAB8: FSK

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	• Lathi, and Ding. "Modern Digital and Analog Communication Systems", 2010.	No
Recommended Texts	• Proakis, and Salehi. "Communication Systems Engineering". 2002.	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	AC Machines II		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ELE018		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UG3	Semester of Delivery	6
Administering Department	Electrical	College	College of Engineering
Module Leader	Name Dr. Mustafa Lateef Hasan	e-mail	E-mail: mustafa.lateef@uoanbar.edu.iq
Module Leader's Acad. Title	lecturer	Module Leader's Qualification	Ph.D.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/11/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE017	Semester	5
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Aims</p> <p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. This course is designed to enable the students to understanding synchronous machines and transformers to the standard required at department level. 2. The course integrates Introduction of SG and SM definition of all types, operation and control of Synchronous machines and transformer for students of the third year in electrical engineering department. Students, in this course, will deals with operation principle of synchronous generator, equivalent circuit of SG and efficiency calculation. 3. Study motor operation mode and its equivalent circuit. Efficiency calculation of SM, starting and stopping of SM. 4. introduction of transformers and its several types. Power transformer and distribution transformer.
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. Knowledge of synchronous machines type in general. 2. Deals with synchronous generators and its control. 3. Deals with parallel operation of SG. 4. Deals with synchronous motors and its control and applications. 5. Deals with single phase and three phase transformer and its operation and application in industry life. 6. Theoretical preparation of students to work in the field of electrical machine design, operation, fault detection and control. 7. Applying numerical method to solve industrial problem
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p>Introduction of Three phase synchronous machines. Basic theory of operation of synchronous generator. (6 hours)</p> <p>Voltage & torque equations for cylindrical rotor of SG. Voltage and - torque equations for salient pole of SG. Parallel operation of SG. (12 hours)</p> <p>Basic theory of operation of synchronous motor. Efficiency and losses of SG. (6 hours)</p> <p>Voltage & torque equations of SM. Efficiency and losses of SM. Starting and stopping of SM. (12 hours)</p> <p>Transformer principle: Single phase transformer, Transformer-types of transformer, construction, phasor diagram, no-load and short circuit tests. (6 hours)</p> <p>losses in transformers, the equivalent circuit of the transformer, efficiency, regulation, auto-transformer. (6 hours)</p> <p>Three phase transformers. Efficiency and maximum efficiency condition of transformer. Parallel operation of transformer. (6 hours)</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in the delivery of this unit is to encourage students to participate in the exercises, while improving and expanding their critical thinking skills at the same time. This will be achieved through classes and interactive educational programs and by thinking about the type of simple experiments that include some theoretical and practical activities that include calculating some important values and selection methods for different types of synchronous motors, generators and transformers. and using theoretical information to identify and predict malfunctions that occur to motors in work sites
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Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction of Three phase synchronous machines
Week 2	basic theory of operation of synchronous generator
Week 3	voltage & torque equations for cylindrical rotor of SG
Week 4	voltage and -torque equations for salient pole of SG
Week 5	Parallel operation of SG
Week 6	basic theory of operation of synchronous motor
Week 7	Efficiency and losses of SG
Week 8	voltage & torque equations of SM
Week 9	Efficiency and losses of SM
Week 10	Starting and stopping of SM
Week 11	Transformer principle
Week 12	Three phase transformers
Week 13	Efficiency and maximum efficiency condition of transformer
Week 14	Parallel operation of transformer
Week 15	Parallel operation of transformer
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1 Introduction of Synchronous Machines.
Week 2	Lab 2: Connection and Rotational Direction Test of Synchronous Generator.
Week 3	Lab 3: No load characteristics of synchronous generator
Week 4	Lab 4: Load characteristics of synchronous generator
Week 5	Lab 5: Mains synchronization and control characteristics of the synchronous generator
Week 6	Lab 6: connection and rotational direction test and load characteristics of synchronous motor.
Week 7	Lab 7: V- curve of the syn. Motor

Week 8	Lab 8 : Open circuit & short circuit tests of single phase transformer.
Week 9	Lab 9: Regulation and efficiency of three phase transformer by direct load.
Week 10	Lab 10: Polarity making and conversion of two winding transformer into auto transformer
Week 11	Lab 11: Back to back test on single phase transformer.
Week 12	Lab 12: SCOTT connection of transformer
Week 13	Laboratory Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	B.L Thiraja, A.K Thiraja, " A text book of electrical technology, volume II	Yes
Recommended Texts	Chapman "Electric Machinery Fundamental", Fourth Edition	No
Websites		

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Electric Power II		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ELE022		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UG3	Semester of Delivery	
Administering Department	Electrical	College	College of Engineering
Module Leader	Mushtaq Najeeb Ahmed		e-mail: mushtaq.najeeb@uoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	1/Feb/2026	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE021		Semester: 5
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course is designed to introduce the 2-port network, ABCD constants, power circle diagram, power flow through T.L. Give an overview of Overhead T.L insulators, string insulators, voltage distribution, and corona. Explain Sag and stress calculations, parabola equation, effect of ice and wind, different level supports, economic operation, and underground cables.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Parameters of 2-port networks 2. Load ability and power flow through T.L. 3. Mechanical design of O.H.T.L. insulators. 4. Voltage distribution on string insulator. 5. Sag calculations through same and different supports. 6. Corona phenomena study. 7. Parameters of underground cables. 8. Economic dispatch of power system.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> • To understand the 2-port networks parameters. • To explain the load ability and power flow through T.L. • To understand O.H.T.L insulators. • To understand the basic concept of sag calculation • To understand underground cables. • To know the principle of economic dispatch of power system.

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

Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعياً	4.133
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعياً	5.2
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	25%		1,2,3
	Assignments	1	5 %		4,5,6
	Activities	1	5 %		7,8
	Report	1	5 %		1,2,5,8
Summative assessment	Midterm Exam	1hr	10 %		8,7,3,4,5
	Final Exam	3hr	50 %		all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	2-Port Networks and Determination Short T.L. Parameters
Week 2	ABCD Method for Medium Transmission Lines
Week 3	ABCD method for long transmission lines and 2-Cascaded T.L
Week 4	Power Flow through T.L., Sending and Receiving Circle Diagrams
Week 5	Power Flow through T.L., Sending and Receiving Circle Diagrams
Week 6	Overhead T.L Components, Conductor Materials, and Line Supports
Week 7	Overhead T.L Components, Conductor Materials, and Line Supports
Week 8	Potential Distribution over Suspension Insulator String
Week 9	Potential Distribution over Suspension Insulator String
Week 10	Corona and Sag in Overhead Transmission Lines
Week 11	Corona and Sag in Overhead Transmission Lines
Week 12	Underground Cables
Week 13	Underground Cables
Week 14	Economic Operation of Power Generation (without line losses)
Week 15	Economic Operation of Power Generation (with line losses)
Week 16	Final Exam

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

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	W. Stevenson, element of power system analysis, McGraw- Hill Pub., 2005.	No
Recommended Texts	Principles of power system, V.K Mehta, S. Chand & company Ltd., 2004.	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Electronic II		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ELE010		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UG3	Semester of Delivery	
Administering Department	Electrical	College	College of Engineering
Module Leader	Omar Khaldoon Adulrahman		e-mail okabdulrahman@uoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/nov/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE009	Semester	4
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the Power Amplifiers: Definitions and Amplifier Types . Feedback Circuits: Feedback Concepts, Feedback Connection Types .Linear Oscillators : Basic Principles of Sinusoidal Oscillators , Positive Feedback and Oscillation, The oscillation Criterion . RC Oscillator: RC Phase-Shift Oscillator and Wien-Bridge oscillator. LC and Crystal Oscillator . Non-Sinusoidal Oscillators and Tim Circuits. Schmitt Trigger Oscillator, The 555 Circuit and applications (Monostable ultivibrator, Astable Multivibrator). Power Supplies (Voltage Regulators) and Practical Applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1- Understand the Amplifiers types, and analyze the feedback circuit and feedback conniction 2-Understand the principles of Oscillation, and its circuits and application. 3- Understand the Power supplies and voltage regulation.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> • Power Amplifiers: Definitions, Amplifier Classes and Efficiency •Feedback Circuits: Feedback Concepts. Feedback Connection Types. • Practical Feedback Circuits: Voltage –shunt, Voltage- series configuration. • Practical Feedback Circuits: Current –shunt, Current - series configuration. • Linear Oscillators: Basic Principles of Sinusoidal Oscillators, • Power Supplies (Voltage Regulators) and Practical Applications.

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

Student Workload (SWL) الحمل الدراسي للطالب					
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل		77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً		5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل		48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً		3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل		125			
Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	10% (10)	5, 10	1
	Assignments	2	5% (5)	2, 12	2
	Projects / Lab.	1	10% (10)		3
	Report	1			1
Summative assessment	Midterm Exam	2hr	15% (15)	8	2
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	• Power Amplifiers: Definitions, Amplifier Classes and Efficiency
Week 2	• Class A amplifiers.
Week 3	• Class B amplifiers and Class- (AB), Class- (C)
Week 4	• Feedback Circuits: Feedback Concepts. Feedback Connection Types.
Week 5	• Practical Feedback Circuits: Voltage –shunt, Voltage- series configuration.
Week 6	• Practical Feedback Circuits: Current –shunt, Current - series configuration.
Week 7	• Linear Oscillators: Basic Principles of Sinusoidal Oscillators, Positive Feedback and Oscillation,
Week 8	• RC Phase-Shift Oscillator and Wien Bridge Oscillator
Week 9	• LC Oscillator, Crystal Oscillator,
Week 10	• Non-Sinusoidal Oscillators and Timer Circuits Schmitt Trigger Oscillator.
Week 11	• The 555 Circuit and applications (Monostable Multivibrator)
Week 12	• Astable Multivibrator
Week 13	• Power Supplies (Voltage Regulators) and Practical Applications.
Week 14	• Discrete Transistor Voltage Regulation
Week 15	• IC Voltage Regulators.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	Material Covered
Week 1	Differential amplifiers
Week 2	Active filter.
Week 3	The triangle- square wave generator.
Week 4	Applying Negative Feedback on Amplifiers part
Week 5	RC Phase – shift Oscillators(part 1)
Week 6	RC Phase – shift Oscillators(part 2)
Week 7	LC Oscillator(part 1)
Week 8	LC Oscillator(part 2)
Week 9	Voltage Regulator
Week 10	Current Regulator
Week 11	Laboratory Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	R. Boylestad and L. Nashelsky, “Electronic Devices and Circuit Theory”, 11th edition , 2013	No
Recommended Texts	Electronic devices : electron flow version / Thomas L. Floyd.— 9th edition.	No
Websites		

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer Programming		Module Delivery
Module Type	Basic		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	ELE019		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UG3	Semester of Delivery	
Administering Department	Electrical	College	College of Engineering
Module Leader	Dr. Mohammad Khaleel Awsaj	e-mail	Mohammed.awsaj@uoanbar.edu.iq
Module Leader's Acad. Title	Ass. Professor Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	01/11/2025	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Aims أهداف المادة الدراسية	This course provides introduction to MATLAB. Programming in MATLAB includes input and output of data, algebraic and logical expressions, all data types including complex numbers and strings, array indexing and array operations, matrices and matrix operations, control structures, graphics and plots. Applications of MATLAB to solutions of engineering problems include solutions of systems of linear equations. Introduction to Simulink.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none">1. Become familiar with fundamental operations in Matlab.2. Use matrix forms to describe and solve linear systems of equations.3. Programming with MATLAB to solve mathematical and engineering problems.4. Use MATLAB to generate graphics.5. Use the Simulink simulation package to simulate some electric circuits.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none">• General introduction to MATLAB.• Numeric, Cell, and Structure Arrays.• Matrix and Array Operations.• Matrix Methods for solving linear equations.• Script Files and Functions.• Programming in MATLAB.• Control flow and operators.• Plotting, creating multiple plot types and three-dimensional plots.• Introduction to Simulink and its instruments.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Type something like: The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	47	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	53	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	1,2,3
	Assignments	2	10% (10)	2, 12	4,1,2
	Projects / Lab.	1	10% (10)	Continuous	1.3
	Report	1	10% (10)	13	1.3
Summative assessment	Midterm Exam	2 hr	10% (10)	7	1,4,5
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	General introduction to MATLAB.
Week 2	Numeric, Cell, and Structure Arrays.
Week 3	Matrix and Array Operations.
Week 4	Matrix Methods for solving linear equations.
Week 5	Script Files and Functions.
Week 6	Programming in MATLAB.

Week 7	Programming Exercises
Week 8	Programming Exercises
Week 9	Mid – term Exam
Week 10	Control flow and operators.
Week 11	Control flow and operators.
Week 12	Plotting, creating multiple plot types and three dimensional plots.
Week 13	Plotting, creating multiple plot types and three dimensional plots.
Week 14	Introduction to Simulink and its instruments.
Week 15	Introduction to Simulink and its instruments.
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to MATLAB program.
Week 2	Lab 2: Matrix and Array arithmetic operations in MATLAB
Week 3	Lab 3: Solving Linear Equations in MATLAB
Week 4	Lab 4: Programming in MATLAB
Week 5	Lab 5: Control Flow and Operators in MATLAB
Week 6	Lab 6: Plotting in MATLAB
Week 7	Lab 7: Introduction to Simulink in MATLAB

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Introduction to MATLAB for Engineers by William J. Palm III, McGraw-Hill, 3rd Edition, 2011.	No
Recommended Texts	Introduction To MATLAB For Engineering Students by David Houcque, Northwestern University, (version 1.2, August 2005)	No
Websites		

Grading Scheme

مخطط الدرجات

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

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

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	Signals and Systems II	Module Delivery	
Module Type	Core	<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar	
Module Code	ELE012		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	3	Semester of Delivery	6
Administering Department	Electrical	College	College of Engineering
Module Leader	Adnan Salih Suhail	e-mail	adnansaheluoanbar.edu.iq
Module Leader's Acad. Title	Dr.	Module Leader's Qualification	Ph.D.
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	30/Oct/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	ELE011	Semester	5
Co-requisites module		Semester	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	This course introduces the fundamentals of the discrete-signals and systems. It studies the linear time-invariant (LTI) systems and their impulse response, convolution. The Discrete-Fourier transform, and series of Discrete-Time signals. The course teaches the frequency response and its applications in the electrical systems and signals communication.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1-Understand the basic types of discrete signals and systems. 2-Understand the causality and stability of D-T LTI systems. 3-Understand and deploy the Fourier transform/series of Discrete-time signals and Systems in the electrical engineering.
Indicative Contents المحتويات الإرشادية	<ul style="list-style-type: none"> • Introduction to D.T system, impulse response, and convolution. • Classification of D-T LTI system. • types of D-Tsignals, and classification of signals. • Frequency response of D-T LTI system, • system function and transfer function using Z-Transform. • Block diagram characterization of LTI system. • solution of system difference equation using Z-Transform.

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

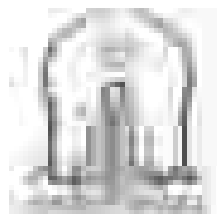
Student Workload (SWL) الحمل الدراسي للطلاب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	150	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	10
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	88	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	238		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	8% (8)	5, 10	2
	Assignments	2	5% (5)	3, 11	1
	Projects	1	5% (5)		3
					2
Summative assessment	Midterm Exam	2hr/2	20% (22)	8, 14	1
	Final Exam	3hr	60% (60)	16	all
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
Week	Material Covered
Week 1	Introduction to Discrete-Time (D-T) signals and Definition of Signals & Systems
Week 2	Classification of D-T Signals
Week 3	Operations on D-T signals
Week 4	Properties of D-T LTI system
Week 5	Analysis of responses, and convolution
Week 6	Representation of Discrete Fourier Series
Week 7	Properties of D-T Fourier series, Complex Fourier Series
Week 8	Midterm Exam
Week 9	Discrete-Time Fourier Transform, Properties of Fourier Transforms
Week 10	LTI-System Function & Impulse Function
Week 11	block diagram representation of a LTI Discrete-time system described by a difference equation.
Week 12	characterize LTI D-T systems in the time domain using impulse response and difference equations.
Week 13	Z-Transform, properties of Z-T, inverse Z-T, Z-T of basic D-T signals.
Week 14	Midterm Exam
Week 15	use the transfer function of a LTI D-T system and the inverse Z-transform to obtain the system output
Week 16	Final Exam

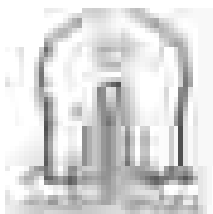
Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	#Oppenheim; Willsky; Hamid; "Signals and Systems" 2nd ed.	No
Recommended Texts	#Hsu; "Schaum's Outline of Signals and Systems" 3ed.	No
Websites	https://www.tutorialspoint.com/signals_and_systems	

Grading Scheme مخطط الدرجات				
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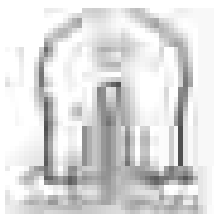
استمارة وصف المقرر الدراسي

1.	اسم المقرر: [مختبر السيطرة]
2.	رمز المقرر: EE4331
3.	الفصل / السنة: الفصل الثاني \ 2025-2026
4.	تاريخ إعداد هذا الوصف 2025-9-24
5.	أشكال الحضور المتاحة : حضوري
6.	عدد الساعات الدراسية (الكلية): 45 عدد الوحدات (الكلية): 1
7.	اسم مسؤول المقرر الدراسي (إذا اكثر من اسم يذكر) م. ياسمين كامل نجم yknajm@uoanbar.edu.iq
8.	اهداف المقرر يهدف هذا المقرر الى: 1-تطبيق مختبري لدراسة أسس السيطرة التماثلية 2- تطبيق مختبري لدراسة أسس كيفية التعامل مع انظمة السيطرة 3-يمنح هذا الفصل أساس تجريبي لفهم التحكم في أنظمة التغذية الراجعة 4- يمنح هذا الفصل أساس تجريبي التمثيل الرياضي للعديد من الأنظمة الفيزيائية
9.	استراتيجيات التعليم والتعلم ا. فهم المبادئ الرئيسية لعمل انظمه السيطرة ب. دراسة الموديلات الرياضية لأنظمة السيطرة ج. الدراسة النظرية و اجراء التطبيقات في المختبر د. تصميم بعض انظمه السيطرة و تطبيقها عمليا



هـ. التطبيق العملي لاهم انظمه السيطرة في المختبر
و. ربط الدراسة النظرية لبعض التطبيقات بالجانب العملي

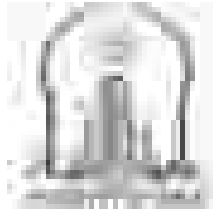
10. بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
الأول	3	Compensator	محاضرة 1	نظري + عملي	تقارير يومية + مناقشة
الثاني	3	Phase lag compensator Part 1	تجربة 9- جزء 1	نظري + عملي	تقارير يومية + مناقشة
الثالث	3	Phase lag compensator Part 2	تجربة 9- جزء 2	نظري + عملي	تقارير يومية + مناقشة
الرابع	3	Phase lead compensator Part1	تجربة 10- جزء 1	نظري + عملي	تقارير يومية + مناقشة
الخامس	3	Phase lead compensator Part12	تجربة 10- جزء 2	نظري + عملي	تقارير يومية + مناقشة
السادس	3	Phase lead-lag compensator	تجربة 11	نظري + عملي	تقارير يومية + مناقشة
السابع	3	Examination	امتحان نظري + عملي	نظري + عملي	امتحان نظري + عملي
الثامن	3	Integral controller	تجربة 12	نظري + عملي	تقارير يومية + مناقشة
التاسع	3	Derivative controller	تجربة 13	نظري + عملي	تقارير يومية + مناقشة
العاشر	3	portional + integral controller part 1	تجربة 14- جزء 1	نظري + عملي	تقارير يومية + مناقشة
الحادي عشر	3	portional + integral controller part 2	تجربة 14- جزء 2	نظري + عملي	تقارير يومية + مناقشة
الثاني عشر	3	Proportional +Derivative controller	تجربة 15	نظري + عملي	تقارير يومية + مناقشة
الثالث عشر	3	examination	امتحان نظري + عملي	نظري + عملي	امتحان نظري + عملي
الرابع عشر	3	Proportional + integral + derivative controller	تجربة 16	نظري + عملي	تقارير يومية + مناقشة
الخامس عشر	3	Final course exam	امتحان نظري + عملي	نظري + عملي	امتحان نظري + عملي
1. تقييم المقرر					



- المشاركة الفاعلة اثناء المحاضرة دليل التزام الطالب وتحمله المسؤولية.
- الالتزام بالموعد المحدد في تقديم الواجبات والتقارير اليومية
- تعبر الاختبارات الفصلية والنهائية عن الالتزام والتحصيل المعرفي والمهارى.
- التطبيقات والتمارين والواجبات اليومية

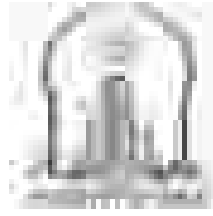
2. مصادر التعلم والتدريس

ملزمة المختبر من اعداد تدريسي القسم	الكتب المقررة المطلوبة (المنهجية أن وجدت)
لا يوجد	المراجع الرئيسية (المصادر)
لا يوجد	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير.... (
	المراجع الإلكترونية ، مواقع الانترنت

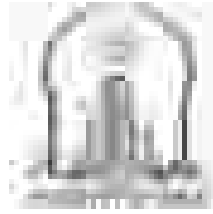


استمارة وصف المقرر الدراسي

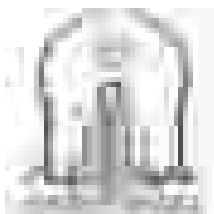
١. اسم المقرر:	الإدارة ومهارات القيادة
٢. رمز المقرر:	EE4108
٣. الفصل / السنة: السنوي	السنة الدراسية الرابعة/ الفصل الدراسي الأول
٤. تاريخ إعداد هذا الوصف	2025/10/01
٥. أشكال الحضور المتاحة:	التعليم الحضوري
٦. عدد الساعات الدراسية (الكلي): 30 عدد الوحدات (الكلي): 2	
٧. اسم مسؤول المقرر الدراسي (إذا أكثر من اسم يذكر)	أ.م.د. معني وليد ناجي
٨. أهداف المقرر	١. الرقي بالمستوى الشخصي للطالب، وبناء رقيه الفكري في بيان مدى أهمية الادارة والقيادة واخلاقيات المهنة ضمن حياته المهنية والاجتماعية . ٢. تطوير الوعي بالتحديات الأخلاقية في الحياة اليومية والعملية. ٣. تطوير الوعي بالإدارة والقيادة.
٩. استراتيجيات التعليم والتعلم	بعد الانتهاء من هذا المقرر، سيتمكن الطلاب من: ١. شرح المفاهيم الأساسية للإدارة والقيادة، وأخلاقيات المهنة . ٢. البناء الشخصي القوة والتأثير في اتخاذ القرار. ٣. تقديم وتلقي الملاحظات، والاستماع بنشاط، وتوفير التواصل الداعم، وتدريب وإرشاد أعضاء فريقهم ٤. تطوير الملكة الفكرية لدى الطالب في مجال القيادة واخلاقيات المهنة فضلا عن الادارة، لاكتساب القدرة والمهارة الفكرية والقولية والعملية.



١٠. بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
الأول	2	أساسيات أخلاقيات المهنة	نبذة مختصرة عن أخلاقيات المهنة، وأثرها في بناء الحضارة في مجال النتاج المهني	نظري	اسئلة عامة ومناقشة
الثاني	2	أساسيات أخلاقيات المهنة	التعريف بأخلاقيات المهنة وبيان أهم القيم والمبادئ المتعلقة بها	نظري	اسئلة عامة ومناقشة واختبار
الثالث	2	استراتيجيات أخلاقيات المهنة	أهداف أخلاقيات المهنة، ومصادرها	نظري	أسئلة عامة ومناقشة
الرابع	2	استراتيجيات أخلاقيات المهنة	وسائل ترسيخ أخلاقيات المهنة المحددات التي تسهم في تطوير وتعزيز القيم لدى موظفيه، وبيان أهم ركائز أخلاقيات العمل، مع بيان المراحل التي غالباً ما يطور الفرد مقاييس أخلاقية عبرها	نظري	أسئلة عامة ومناقشة
الخامس	2	الإدارة والقيادة	التعريف بالمهارات القيادية والقيادة والقائد	نظري	اسئلة عامة ومناقشة واختبار
السادس	2	مبادئ الإدارة	التخطيط والتنظيم	نظري	امتحان شهري
السابع	2	مبادئ الإدارة	والتوجيه والرقابة	نظري	الواجبات الجماعية
الثامن	2	مبادئ الإدارة	إدارة المشاريع	نظري	أسئلة عامة ومناقشة
التاسع	2	الإدارة والقيادة	حقوق الموظف في مكان العمل، وشرح أهم ركائز أخلاقيات العمل، مع شرح المراحل التي يمر بها الفرد غالباً لتطوير المعايير الأخلاقية.	نظري	اسئلة عامة ومناقشة واختبار
العاشر	2	الإدارة والقيادة	الخطوات التي يستطيع الفرد من خلالها إثبات أخلاقيات العمل، وتوضيح أثر الفساد الأخلاقي لدى الموظف والانحراف الذي يسببه في سلوكه الشخصي وتصرفاته المتعلقة بمجال عمله ومهنته.	نظري	أسئلة عامة ومناقشة
الحادي عشر	2	الإدارة والقيادة	حقوق الموظف لدى صاحب العمل وأثرها في تحقيق الأهداف الإستراتيجية للمؤسسة	نظري	امتحان شهري
الثاني عشر	2	القيادة المميزة	أهم صفات القائد والقيادة الناجحة	نظري	اسئلة عامة
الثالث عشر	2	صفات القائد والمدير	القيادة الفعالة للفريق	نظري	مناقشة و امتحان
الرابع عشر	2	النجاح القيادي	صناعة القادة وقادة التغيير.	نظري	أسئلة عامة ومناقشة
الخامس عشر	2	البناء الشخصية للمدير والقائد والموظف	عوامل البناء الشخصي للمهندس في حياته المهنية والاجتماعية	نظري	أسئلة عامة ومناقشة

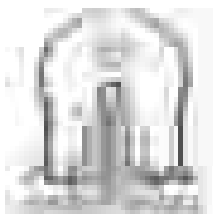


١١ تقييم المقرر	
<p>توزيع الدرجة من ١٠٠ حسب المهام الموكلة للطالب مثل :</p> <ul style="list-style-type: none"> ➤ المشاركة اليومية، التقارير . ➤ الاختبارات (اليومية احياناً، الشهرية، النهائي) 	
١٢ . مصادر التعلم والتدريس	
محاضرات في الإدارة ومهارات القيادة واخلاقيات المهنة .	الكتب المقررة المطلوبة (المنهجية أن وجدت)
<ul style="list-style-type: none"> ➤ Benator, Barry and Thumann, Albert "Project Management and Leadership Skills for Engineering and Construction Projects." 2003, The Fairmont Press, Inc., USA ➤ Fleddermann, C. B. (2012). Engineering Ethics . 	المراجع الرئيسة (المصادر)
مدونة الأخلاقيات - نقابة المهندسين العراقيين	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير...)
<ul style="list-style-type: none"> ➤ الإدارة: أصول وأسس حديثة (Management) المؤلف: ريتشارد دافت - (Richard Daft) مترجم للعربية. ➤ المرجع الشامل للقيادة وصناعة القادة كتاب: "القائد الذي لم يكن له لقب" أو "دليل العظمة" المؤلف: روبن شارما (مترجم) 	المراجع الإلكترونية ، مواقع الانترنت

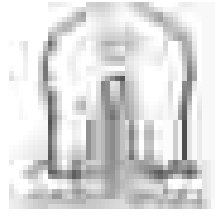


استمارة وصف المقرر الدراسي

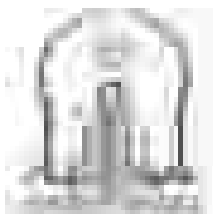
1.	اسم المقرر: مختبر الاتصالات
2.	رمز المقرر: EE328
3.	الفصل / السنة: الفصل الاول 2025-2026
4.	تاريخ إعداد هذا الوصف 15/9/2025
5.	أشكال الحضور المتاحة: حضوري
6.	عدد الساعات الدراسية (الكلي): 45 عدد الوحدات (الكلي): 3
7.	اسم مسؤول المقرر الدراسي (إذا اكثر من اسم يذكر) أ.م. د. فلاح شلال خليفة f.sh.khalifa@uoanabr.edu.iq
8.	اهداف المقرر
1.	أهداف المقرر : أ - فهم الأجهزة الكهربائية المستخدمة في المختبر، بما في ذلك أجهزة القياس المتعددة، وإمدادات الطاقة، وموظائف، وأجهزة قياس الذبذبات ب- تصميم وإجراء التجارب، فضلاً عن تحليل البيانات وتفسيرها. ج- إجراء القياسات الأساسية على الدوائر الإلكترونية. د- فهم متطلبات التنسيق والمحتوى لإعداد التقارير الفنية الكاملة. هـ- تصميم نظام دائرة إلكترونية كامل باستخدام نهج من أعلى إلى أسفل يبدأ من مواصفات النظام، و- التصميم باستخدام أدوات مثل Matlab و Matlab، واختبار الدائرة المكتملة والتحقق من أنها تلي مواصفات التصميم
9.	استراتيجيات التعليم والتعلم
	- اختبارات مفاجئة يومية وأسبوعية مستمرة. - تمارين وأنشطة داخل الفصل. - توجيه الطلبة إلى بعض المصادر التي تحتوي على أمثلة وتمارين للاستفادة منها.



10. بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
الأول	3	RF oscillators	تجربة 1	نظري + عملي	تقارير يومية + مناقشة
الثاني	3	Phase lag compensator Part 1	تجربه 2	نظري + عملي	تقارير يومية + مناقشة
الثالث	3	2nd order filter	تجرب 3	نظري + عملي	تقارير يومية + مناقشة
الرابع	3	Amplitude modulation	تجربه 4	نظري + عملي	تقارير يومية + مناقشة
الخامس	3	Amplitude demodulation	تجربه 5	نظري + عملي	تقارير يومية + مناقشة
السادس	3	AM-DSB-LC Modulation	تجربه 6	نظري + عملي	تقارير يومية + مناقشة
السابع	3	AM-DSB-LC Demodulation	تجربه 7	نظري + عملي	تقارير يومية + مناقشة
الثامن	3	Mid-term exam		نظري + عملي	
التاسع	3	AM-DSB-SC Modulation	تجربه 9	نظري + عملي	تقارير يومية + مناقشة
العاشر	3	AM-DSB-SC Demodulation	تجربه 10	نظري + عملي	تقارير يومية + مناقشة
الحادي عشر	3	Frequency Modulation	تجربه 11	نظري + عملي	تقارير يومية + مناقشة
الثاني عشر	3	Frequency Demodulation	تجربه 12	نظري + عملي	اسئلة عامة و مناقشة
الثالث عشر	3	FDM	تجربة 13	نظري + عملي	امتحان شهري نظري + عملي
الرابع عشر	3	Sampling	تجربه 14	نظري + عملي	الواجبات الجماعية

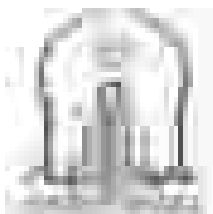


نظري + عملي	نظري + عملي	امتحان نهائي	Final course exam	3	الخامس عشر
11. تقييم المقرر					
<ul style="list-style-type: none"> • المشاركة اثناء المحاضرة. • تقديم التقارير • اختبارات فصلية ونهائية وأنشطة . 					
12. مصادر التعلم والتدريس					
Laboratory sheet prepared by department lecturers		الكتب المقررة المطلوبة (المنهجية أن وجدت)			
		المراجع الرئيسية (المصادر)			
		الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)			
		المراجع الإلكترونية ، مواقع الانترنت			



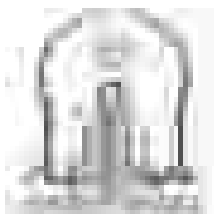
استمارة وصف المقرر الدراسي

1. اسم المقرر: مختبر الاتصالات
2. رمز المقرر: EE329
3. الفصل / السنة: الفصل الثاني 2025-2026
4. تاريخ إعداد هذا الوصف 1/12/2026
5. أشكال الحضور المتاحة: حضوري
6. عدد الساعات الدراسية (الكلية): 45 عدد الوحدات (الكلية): 3
7. اسم مسؤول المقرر الدراسي (إذا اكثر من اسم يذكر) أ.م. د. فلاح شلال خليفة f.sh.khalifa@uoanbar.edu.iq
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9. استراتيجيات التعلم والتعليم
- اختبارات مفاجئة يومية وأسبوعية مستمرة. - تمارين وأنشطة داخل الفصل. - توجيه الطلبة إلى بعض المصادر التي تحتوي على أمثلة وتمارين للاستفادة منها.

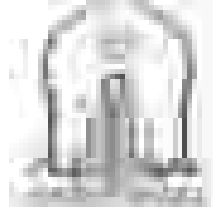


10. بنية المقرر

الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
الأول	3	ADC DAC	تجربة 1	نظري + عملي	تقارير يومية + مناقشة
الثاني	3	PCM	تجربه 2	نظري + عملي	تقارير يومية + مناقشة
الثالث	3	PCDEMODO	تجرب 3	نظري + عملي	تقارير يومية + مناقشة
الرابع	3	PW Modulation	تجربه 4	نظري + عملي	تقارير يومية + مناقشة
الخامس	3	PW Demodulation	تجربه 5	نظري + عملي	تقارير يومية + مناقشة
السادس	3	TDM	تجربه 6	نظري + عملي	تقارير يومية + مناقشة
السابع	3	ASK	تجربه 7	نظري + عملي	تقارير يومية + مناقشة
الثامن	3	Mid-term exam		نظري + عملي	
التاسع	3	ASK	تجربه 9	نظري + عملي	تقارير يومية + مناقشة
العاشر	3	FSK	تجربه 10	نظري + عملي	تقارير يومية + مناقشة
الحادي عشر	3	FSK	تجربه 11	نظري + عملي	تقارير يومية + مناقشة
الثاني عشر	3	PSK	تجربه 12	نظري + عملي	اسئلة عامة و مناقشة
الثالث عشر	3	PSK	تجربة 13	نظري + عملي	امتحان شهري نظري + عملي
الرابع عشر	3	MPSK	تجربه 14	نظري + عملي	الواجبات الجماعية

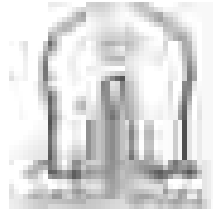


نظري + عملي	نظري + عملي	امتحان نهائي	Final course exam	3	الخامس عشر
11. تقييم المقرر					
<ul style="list-style-type: none"> • المشاركة اثناء المحاضرة. • تقديم التقارير • اختبارات فصلية ونهائية وأنشطة . 					
12. مصادر التعلم والتدريس					
Laboratory sheet prepared by department lecturers			الكتب المقررة المطلوبة (المنهجية أن وجدت)		
			المراجع الرئيسية (المصادر)		
			الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)		
			المراجع الإلكترونية ، مواقع الانترنت		



استمارة وصف المقرر الدراسي

1.	اسم المقرر: [مختبر السيطرة]
2.	رمز المقرر: EE4330
3.	الفصل / السنة: الفصل الاول \ 2025-2026
4.	تاريخ إعداد هذا الوصف 2025-9-24
5.	أشكال الحضور المتاحة : حضوري
6.	عدد الساعات الدراسية (الكلية): 45 عدد الوحدات (الكلية): 1
7.	اسم مسؤول المقرر الدراسي (إذا اكثر من اسم يذكر) م. ياسمين كامل نجم
	yknajm@uoanbar.edu.iq
8.	اهداف المقرر يهدف هذا المقرر الى: 1-تطبيق مختبري لدراسة أسس السيطرة التماثلية 2- تطبيق مختبري لدراسة أسس كيفية التعامل مع انظمة السيطرة 3-يمنح هذا الفصل أساس تجريبي لفهم التحكم في أنظمة التغذية الراجعة 4- يمنح هذا الفصل أساس تجريبي التمثيل الرياضي للعديد من الأنظمة الفيزيائية
9.	استراتيجيات التعليم والتعلم ا. فهم المبادئ الرئيسية لعمل انظمه السيطرة ب. دراسة الموديلات الرياضية لأنظمة السيطرة ج. الدراسة النظرية و اجراء التطبيقات في المختبر د. تصميم بعض انظمه السيطرة و تطبيقها عمليا

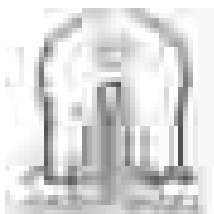


هـ. التطبيق العملي لاهم انظمه السيطرة في المختبر
و. ربط الدراسة النظرية لبعض التطبيقات بالجانب العملي

10. بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
الأول	3	Definition for control system and the parts of the system models -1000- ACS	Lec 1	نظري + عملي	تقارير يومية + مناقشة
الثاني	3	Laplace transformer Part 1	تجربة 1- جزء 1	نظري + عملي	تقارير يومية + مناقشة
الثالث	3	Laplace transformer Part 2	تجربة 1- جزء 2	نظري + عملي	تقارير يومية + مناقشة
الرابع	3	Introduction to MAT-LAB- Simulink - part 1	Lec 2	نظري + عملي	تقارير يومية + مناقشة
الخامس	3	Introduction to MAT-LAB- Simulink - part 1	Lec 3	نظري + عملي	تقارير يومية + مناقشة
السادس	3	First order system	تجربة 2- جزء 1	نظري + عملي	تقارير يومية + مناقشة
السابع	3	Examination	امتحان نظري + عملي	نظري + عملي	امتحان نظري + عملي
الثامن	3	Second order system	تجربة 3	نظري + عملي	تقارير يومية + مناقشة
التاسع	3	Transient Response Specifications	تجربة 4	نظري + عملي	تقارير يومية + مناقشة
العاشر	3	Steady State Error Part 1	تجربة 5- جزء 1	نظري + عملي	تقارير يومية + مناقشة
الحادي عشر	3	Steady State Error Part2	تجربة 5- جزء 2	نظري + عملي	تقارير يومية + مناقشة
الثاني عشر	3	System simulation	تجربة 6	نظري + عملي	تقارير يومية + مناقشة
الثالث عشر	3	Dominant pole of second order system	تجربة 7	نظري + عملي	تقارير يومية + مناقشة
الرابع عشر	3	Promotional controller	تجربة 8	نظري + عملي	تقارير يومية + مناقشة
الخامس عشر	3	Final course exam	امتحان نظري + عملي	نظري + عملي	امتحان نظري + عملي

1. تقييم المقرر

- المشاركة الفاعلة اثناء المحاضرة دليل التزام الطالب وتحمله المسؤولية.



- الالتزام بالموعد المحدد في تقديم الواجبات والتقارير اليومية
- تعبر الاختبارات الفصلية والنهائية عن الالتزام والتحصيل المعرفي والمهارى.
- التطبيقات والتمارين والواجبات اليومية

2. مصادر التعلم والتدريس

ملزمة المختبر من اعداد تدريسي القسم	الكتب المقررة المطلوبة (المنهجية أن وجدت)
لا يوجد	المراجع الرئيسة (المصادر)
لا يوجد	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير.... (
	المراجع الإلكترونية ، مواقع الانترنت

نموذج وصف المقرر الدراسي

نظرية سيطرة I

المؤسسة التعليمية:	جامعة الأنبار / كلية الهندسة
القسم/المركز:	قسم الهندسة الكهربائية
اسم/رمز المقرر:	نظرية السيطرة I / EE4332
أنماط الحضور المتاحة:	الحضور الإلكتروني
الفصل/السنة:	الفصل الأول 2025-2026
عدد الساعات المعتمدة (الإجمالي) :	90
تاريخ إعداد هذا الوصف:	1/9/2025

أهداف المقرر:

الفهم الصحيح لطرق عمل أنظمة السيطرة.
دراسة نظرية ومحاكاة بالحاسوب لنظريات السيطرة.
تصميم أجهزة سيطرة تقليدية لأنظمة السيطرة جميعها.

النتائج التعليمية وأساليب التعليم والتقييم:

أ - المعرفة والفهم:

تعريف الطالب بتاريخ علم السيطرة وأهم العلماء الذين أحدثوا تغييرات كبيرة في هذا العلم.
يجب أن يتعرف الطالب على الوحدات الأساسية للسيطرة.
يجب أن يعرف الطالب الهيكل العام لمشكلة السيطرة.
تعريف الطالب بأساليب التعامل مع مشاكل السيطرة التقليدية.
يجب أن يعرف الطالب أهداف السيطرة في تقليل التكلفة بأكبر إنتاج وأسرع استجابة.

ب - المهارات التخصصية للمقرر:

العلمية التقارير: B1
التخرج بحوث: B2

هيكل المقرر:

الأسبوع	طريقة التعليم / التقييم	اسم الوحدة/المقرر أو الموضوع	المخرجات التعليمية المطلوبة	الساعات
الأول	أسئلة عامة ونقاش	نظري + نقاش	مقدمة في أنظمة السيطرة	3
الثاني	أسئلة عامة ونقاش أو اختبار 1	نظري + نقاش	التمثيل الرياضي للأنظمة الفيزيائية	3
الثالث	أسئلة عامة ونقاش	نظري + نقاش	دوال التحويل	3
الرابع	اختبارات	نظري + نقاش	الأنظمة الكهربائية؛ الأنظمة الميكانيكية الانتقالية	3
الخامس	أسئلة عامة ونقاش أو اختبار 1	نظري + نقاش	الأنظمة الحرارية؛ أنظمة السوائل؛ الأنظمة المكونة	3
السادس	أسئلة عامة ونقاش	نظري + نقاش	تمثيل الحالة الثابتة للأنظمة الفيزيائية	3
السابع	أسئلة عامة	نظري + نقاش	التحويل بين دالة التحويل والتمثيل	3

	بالحالة الثابتة			
3	معالجة المخططات الصندوقية	نظري + نقاش	واجبات جماعية	الثامن
3	مخططات تدفق الإشارات	نظري + نقاش	أسئلة عامة	التاسع
3	تحليل الاستجابة العابرة	نظري + نقاش	اختبار شهري	العاشر
3	تحليل الاستجابة العابرة	نظري + نقاش	أسئلة عامة	الحادي عشر
3	الخطأ في الحالة المستقرة في أنظمة التغذية الراجعة	نظري + نقاش	نقاش واختبار 1	الثاني عشر
3	الخطأ في الحالة المستقرة في أنظمة التغذية الراجعة	نظري + نقاش	أسئلة عامة	الثالث عشر
3	معيار استقرار روث	نظري + نقاش	واجبات جماعية +نقاش	الرابع عشر
3	معيار استقرار روث	نظري + نقاش	اختبار شهري	الخامس عشر

البنية التحتية:

القراءات المطلوبة:

- كتب المقرر.
- مصادر أخرى :
- السيطرة الهندسي الحديث لكاتسو هيو أوجاتا.
- تحليل وتصميم أنظمة السيطرة الخطية باستخدام / MATLAB جون ج. دازو وكونستانتين.
- أنظمة السيطرة الآلي / بنجامين ك. كو.

المتطلبات الخاصة:

- الخدمات الاجتماعية (مثل المحاضرات الضيفية، التدريب المهني والدراسات الميدانية).
- التطبيق العملي في مشاريع بحوث التخرج.

القبول:

- المتطلبات السابقة EE2209، EE2311، EE3320 و EE3325.
- العدد الأدنى للطلاب. 10 :
- العدد الأقصى للطلاب. 40 :

وصف المقرر الدراسي

نظرية السيطرة II

مراجعة أداء مؤسسات التعليم العالي ((مراجعة البرنامج الأكاديمي))

وصف المقرر الدراسي

يوفر هذا الوصف ملخصاً موجزاً لأهم خصائص المقرر الدراسي والنتائج التعليمية المتوقعة من الطالب تحقيقها، بما يثبت استفادته من الفرص التعليمية المتاحة. ويجب أن يكون هذا الوصف مرتبطاً بوصف البرنامج.

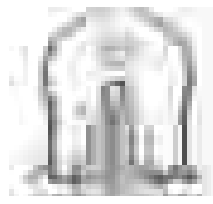
المؤسسة التعليمية:	جامعة الأنبار / كلية الهندسة
القسم/المركز	قسم الهندسة الكهربائية
اسم/رمز المقرر:	نظرية السيطرة 2 / EE4333
البرامج التي يدخل فيها:	
أنماط الحضور المتاحة	الحضور الإلكتروني
الفصل/السنة:	الفصل الثاني 2025-2026
عدد الساعات المعتمدة (الإجمالي):	90
تاريخ إعداد هذا الوصف:	2025 / 10 / 1
المؤسسة التعليمية: جامعة	الأنبار / كلية الهندسة
القسم/المركز:	قسم الهندسة الكهربائية
أهداف المقرر:	
<ol style="list-style-type: none">1. الفهم الصحيح لطرق عمل أنظمة السيطرة.2. دراسة نظرية ومحاكاة بالحاسوب لنظريات السيطرة.3. تصميم أجهزة تحكم تقليدية لأنظمة السيطرة جميعها.	

النتائج التعليمية وأساليب التعليم والتقييم:
أ - المعرفة والفهم:
• تعريف الطالب بتاريخ علم السيطرة وأهم العلماء الذين أحدثوا تغييرات كبيرة في هذا العلم.
• يجب أن يتعرف الطالب على الوحدات الأساسية للتحكم.
• يجب أن يعرف الطالب الهيكل العام لمشكلة السيطرة.
• تعريف الطالب بأساليب التعامل مع مشاكل السيطرة التقليدية.
• يجب أن يعرف الطالب أهداف السيطرة في تقليل التكلفة بأكثر إنتاج وأسرع استجابة.
ب - المهارات التخصصية للمقرر:
• B1: التقارير العلمية.
• B2: بحوث التخرج.
طرق التعليم والتعلم:
• اختبارات يومية فجائية وأسبوعية مستمرة.
• تمارين وأنشطة في الصف.
• توجيه الطلاب إلى بعض المصادر التي تحتوي على أمثلة وتمارين للاستفادة منها.
طرق التقييم:
• المشاركة في الصف.
• تسليم الأنشطة.
• الاختبارات الفصلية والأنشطة.
ج - المهارات الفكرية:
• C1: تطوير قدرة الطالب على أداء الواجبات وتسليمها في الوقت المحدد.
• C2: محاولة تطبيق المفاهيم بحل أنواع مختلفة من التمارين.

هيكل المقرر:

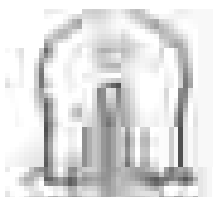
الأسبوع	الساعات	المخرجات التعليمية المطلوبة	اسم الوحدة/المقرر أو الموضوع	طريقة التعليم	طريقة التقييم
الأول	3	جذور المكان	نظري + نقاش	أسئلة عامة ونقاش	
الثاني	3	تصميم أنظمة السيطرة بطريقة جذور المكان	نظري + نقاش	أسئلة عامة ونقاش أو اختبار 1	
الثالث	3	مخطط بود	نظري + نقاش	أسئلة عامة ونقاش	
الرابع	3	المخططات القطبية	نظري + نقاش	اختبارات	
الخامس	3	معيار استقرار ناكويست	نظري + نقاش	أسئلة عامة ونقاش أو اختبار 1	
السادس	3	معيار استقرار ناكويست	نظري + نقاش	أسئلة عامة ونقاش	
السابع	3	أدوات السيطرة الثلاثية: النظام من الدرجة الأولى	نظري + نقاش	أسئلة عامة	
الثامن	3	أدوات السيطرة الثلاثية: النظام من الدرجة الثانية	نظري + نقاش	واجبات جماعية	
التاسع	3	وحدات السيطرة المعدلة PID	نظري + نقاش	أسئلة عامة	
العاشر	3	وحدات السيطرة المعدلة PID	نظري + نقاش	اختبار شهري	
الحادي عشر	3	نظام البيانات العينة	نظري + نقاش	أسئلة عامة	
الثاني عشر	3	نظام البيانات العينة	نظري + نقاش	نقاش واختبار 1	
الثالث عشر	3	تحليل أنظمة السيطرة في فضاء الحالة	نظري + نقاش	أسئلة عامة	
الرابع عشر	3	تحليل أنظمة السيطرة في فضاء الحالة	نظري + نقاش	واجبات جماعية + نقاش	
الخامس عشر	3	قابلية السيطرة والمراقبة	نظري + نقاش	اختبار شهري	

البنية التحتية:
القراءات المطلوبة:
• كتب المقرر.
• مصادر أخرى :
○ السيطرة الهندسي الحديث لكاتسو هيو أوجاتا.
○ تحليل وتصميم أنظمة التحكم الخطية باستخدام / MATLAB جون ج. دازو وكونستانتين.
○ أنظمة السيطرة الآلي / بنجامين ك. كو.
المتطلبات الخاصة:
• الخدمات الاجتماعية (مثل المحاضرات الضيفية، التدريب المهني والدراسات الميدانية).
• التطبيق العملي في مشاريع بحوث التخرج.
القبول:
• المتطلبات السابقة. EE4332 :
• العدد الأدنى للطلاب. 10 :
• العدد الأقصى للطلاب. 40 :



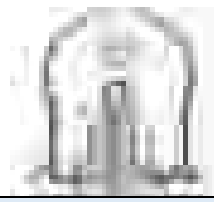
استمارة وصف المقرر الدراسي

1.	اسم المقرر: المتحكم المنطقي المبرمج
2.	رمز المقرر: EE4345
3.	الفصل / السنة: الفصل الثاني / السنة الدراسية الرابعة
4.	تاريخ إعداد هذا الوصف : 2025/12/1
5.	أشكال الحضور المتاحة : دوام حضوري
6.	عدد الساعات الدراسية (الكلي): 45 عدد الوحدات (الكلي): 45
7.	اسم مسؤول المقرر الدراسي (إذا اكثر من اسم يذكر) أ.م.د. معاذ جاسم محمد
8.	اهداف المقرر - إعداد ملاكات هندسية يمكنها التعامل مع منظومات السيطرة التي تحتوي على المتحكم المنطقي المبرمج وكيفية برمجته وربطه مع وحدات الادخال (المتحسسات) والايخارج (المسوقات). - إعداد مهندسين أكفاء في تنفيذ وتصميم منظومات ألاتمته والتحكم الالي. - غرس اخلاقيات المهنة في نفوس الخرجين .
9.	استراتيجيات التعليم والتعلم - يتعرف الطالب على معمارية المتحكم المنطقي المبرمج . - اعطاء الطالب برمجة المتحكم المنطقي المبرمج . - يتعرف على اجهزة المتحسسات والمسوقات وطريقة ربطها مع المتحكم المنطقي المبرمج.



10. بنية المقرر

الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
الاول	3	Introduction to Programmable logic controllers	Introduction to Programmable logic controllers	نظري + مناقشة	اسئلة عامة ومناقشة
الثاني	3	Internal architecture of PLC	Internal architecture of PLC	نظري + مناقشة	اسئلة عامة ومناقشة او امتحان اني
الثالث	3	Input-output devices	Input-output devices	نظري + مناقشة	أسئلة عامة ومناقشة
الرابع	3	I/O processing	I/O processing	نظري + مناقشة	اسئلة عامة ومناقشة
الخامس	3	Ladder programming	Ladder programming	نظري + مناقشة	أسئلة عامة ومناقشة او امتحان اني
السادس	3	functional block programming	functional block programming	نظري + برمجة	اسئلة عامة وبرمجة
السابع	3	PLC Program examples	PLC Program examples	نظري + برمجة	اسئلة عامة وبرمجة
الثامن	3	PLC Program examples	PLC Program examples	نظري + برمجة	اسئلة عامة وبرمجة
التاسع	3	Exam	Exam	نظري + برمجة	امتحان شهري
العاشر	3	Internal relays	Internal relays	نظري + مناقشة	أسئلة عامة ومناقشة
الحادي عشر	3	Types of timers	Types of timers	نظري + مناقشة	أسئلة عامة ومناقشة
الثاني عشر	3	Programming timers	Programming timers	نظري + مناقشة	أسئلة عامة ومناقشة
الثالث عشر	3	Forms of counter	Forms of counter	نظري + مناقشة	أسئلة عامة ومناقشة او امتحان اني
الرابع عشر	3	Programming counter	Programming counter	نظري + مناقشة	أسئلة عامة ومناقشة
الخامس عشر	3	Exam	Exam	نظري + مناقشة	امتحان شهري



11. تقييم المقرر

- المشاركة الفاعلة في قاعة الدرس دليل التزام الطالب وتحمله المسؤولية.
- الالتزام بالموعد المحدد في تقديم الواجبات والبحوث.
- تعبر الاختبارات الفصلية والنهائية عن الالتزام والتحصيل المعرفي والمهاري.
- التطبيقات والتمارين والواجبات اليومية

12. مصادر التعلم والتدريس

	الكتب المقررة المطلوبة (المنهجية أن وجدت)
<ul style="list-style-type: none">- W. Bolton , “ Programmable Logic Controllers ”- Dag H. Hanssen, ProgrammableLogic Controllers"	المراجع الرئيسية (المصادر)
	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)
https://ladderlogicworld.com https://www.rockwellautomation.com	المراجع الإلكترونية ، مواقع الانترنت



1. اسم المقرر: أنظمة الاتصالات البصرية					
2. رمز المقرر: ELE024					
3. الفصل / السنة: الثاني/ المرحلة الرابعه 2025-2026					
4. تاريخ إعداد هذا الوصف : 2025-9-15					
5. أشكال الحضور المتاحة : نظريات ومحاضرات ومسائل					
6. عدد الساعات الدراسية (الكلي): 150 عدد الوحدات (الكلي): 6 وحدات اوريبة					
7. اسم مسؤول المقرر الدراسي (اذا اكثر من اسم يذكر) الاسم : د محمد خليل عوسج الجنابي الايمل : Mohammed.awsaj@uoanbar.edu.iq					
8. اهداف المقرر يقدم هذا المقرر مقدمة عن اتصالات الألياف الضوئية، وأنظمة الاتصالات العامة، ونطاقات الاتصالات الضوئية. كما يقدم أنواع كابلات الألياف الضوئية ومضخماتها، وخصائص نقل الإشارة فيها، وتجد حلولاً لمشاكل توهين الإشارة وتشتتها. بالإضافة الى مفهوم تأثير الطاقة المنخفضة التي تستقبلها الكواشف الضوئية , ليستطيع الطالب من فهم عمل نظام الاتصالات الضوئية ككل.					
9. استراتيجيات التعليم والتعلم تتمثل الاستراتيجية الرئيسية المتبعة في تقديم هذه الوحدة في تشجيع مشاركة الطلاب في التمارين، مع العمل في الوقت نفسه على صقل مهاراتهم في التفكير النقدي وتوسيع نطاقها. وسيحقق ذلك من خلال الحصص الدراسية، والدروس التفاعلية، ومن خلال النظر في بعض الأنشطة التي تنير اهتمام الطلاب.					
10. بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
الأول	3		General introduction to optical communication.	النظرية والمحاضرة والدروس التعليمية	الاختبارات، الواجبات، الأنشطة
الثاني	3		General communication system optical communication bands	النظرية والمحاضرة والدروس التعليمية	الاختبارات، الواجبات، الأنشطة
الثالث	3		Ray Transmission Theory.	النظرية والمحاضرة والدروس التعليمية	الاختبارات، الواجبات، الأنشطة
الرابع	3		Modes Theory of optical fiber	النظرية والمحاضرة والدروس التعليمية	الاختبارات، الواجبات، الأنشطة
الخامس	3		Optical fiber types.	النظرية والمحاضرة والدروس التعليمية	الاختبارات، الواجبات، الأنشطة
السادس	3		Amplifier classes, performance parameter.	النظرية والمحاضرة والدروس التعليمية	الاختبارات، الواجبات، الأنشطة
السابع	3		Amplifiers types.	النظرية والمحاضرة والدروس التعليمية	الاختبارات، الواجبات، الأنشطة
الثامن	3		Single Modes and Multimode Fi	النظرية والمحاضرة والدروس التعليمية	الاختبارات، الواجبات، الأنشطة
التاسع	3		Mid – term Exam		
العاشر	3		Transmission Characteristics.	النظرية والمحاضرة	الاختبارات،



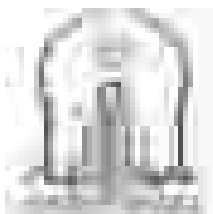
الواجبات، الأنشطة	والدروس التعليمية	Attenuation.			
الاختبارات، الواجبات، الأنشطة	النظرية والمحاضرة والدروس التعليمية	Dispersion.		3	الحادي عشر
الاختبارات، الواجبات، الأنشطة	النظرية والمحاضرة والدروس التعليمية	Dispersion Compensating Fibe		3	الثاني عشر
الاختبارات، الواجبات، الأنشطة	النظرية والمحاضرة والدروس التعليمية	General Characteristics of Optic Sources.		3	الثالث عشر
الاختبارات، الواجبات، الأنشطة	النظرية والمحاضرة والدروس التعليمية	Light Emitting Diodes LEDs.		3	الرابع عشر
الاختبارات، الواجبات، الأنشطة	النظرية والمحاضرة والدروس التعليمية	Laser Diodes.		3	الخامس عشر

11. تقييم المقرر

		الوقت/العدد	الوزن (العلامات)	الأسبوع المستحق	نتائج التعلم ذات الصلة
التقييم التكويني	الاختبارات	5	25% (25)	3,6,9,11, and 13	
	الواجبات	2	5% (5)	4 and 12	
	الأنشطة	1	5% (5)	7	
	التقارير	1	5% (5)	12	
التقييم التلخيصي	امتحان منتصف الفصل الدراسي	2 ساعة	10% (10)	9	
	الامتحان النهائي	3 ساعات	50% (50)	16	
	التقييم الإجمالي		100% (100)		

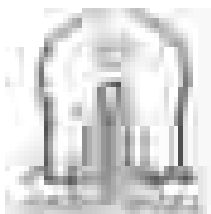
12. مصادر التعلم والتدريس

[1] T. Schneider, <i>Nonlinear Optics in Telecommunications</i> . Springer-Verlag, 2004.	الكتب المقررة المطلوبة (المنهجية أن وجدت)
G. P. Agrawal, <i>Applications of Nonlinear Fiber Optics</i> , 2 nd. Academic Press, 2008. [2]	
C. Headley and G. P. Agrawal, <i>Raman Amplification in Fiber Optical Communication Systems</i> . USA: Elsevier, 2005.	المراجع الرئيسية (المصادر)
	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)
	المراجع الإلكترونية ، مواقع الانترنت

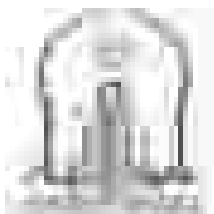


استمارة وصف المقرر الدراسي

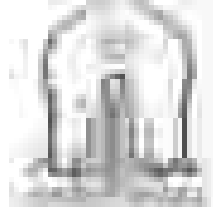
1. اسم المقرر: الكترونيكا القدرة
2. رمز المقرر: EE4337
3. الفصل / السنة: السنوي الفصل الثاني / 2025-2026
4. تاريخ إعداد هذا الوصف 1/12/2026
5. أشكال الحضور المتاحة : دوام حضوري
6. عدد الساعات الدراسية (الكلية): 60 عدد الوحدات (الكلية): 4
7. اسم مسؤول المقرر الدراسي (إذا اكثر من اسم يذكر)
8. ا.م.د. فلاح شلال خليفة F.sh.khalifa@uoanabar.edu.iq
9. اهداف المقرر
<p>أ- اكتساب الطالب على معلومات تفصيلية عن العناصر الألكترونية وخواصها التي تؤهلها في استخدامها في الكترونيات القوى .</p> <p>ب- يهدف المقرر الى دراسة بعض الموحدات المحكومة احاية وثلاثية الطور حيث تحول هذه الموحدات جهد المصدر المتناوب وله قيمة فعالة ثابتة جه مستمر متغير حيث يتم التحكم فيه عن طريق وائر اشعال المفاتيح الألكترونية المستخدمة في هذه الوائر .</p> <p>ج- يهدف المقرر الى دراسة بعض مقطعات التيار المستمر حيث تهدف هذه المقطعات الى تحويل جهد المصدر الثابت المستمر الى جهد مستمر متغير القيمة ويمكن التحكم فيه عن طريق التحكم في دوائر اشعال المفاتيح الألكترونية المستخدمة في وائر المقطعات في زمن فصل وغلق الم الألكترونية.</p> <p>د- يهدف المقرر الى بعض العواكس احادية الطور حيث تستخدم هذه العواكس لتحويل جهد المصدر الثابت المستمر الى جهد متناوب ثابت او م القيمة حيث يتم التحكم في هذا الجهد عن طريق التحكم في زمن غلق وفصل المفاتيح الألكترونية المستخدمة في هذه العواكس وأيضا بالتحكم في التردد المطلوب لفصل وغلق هذه المفاتيح الألكترونية.</p>
استراتيجيات التعليم والتعلم
1. - الاختبارات اليومية المفاجئة والاسبوعية المستمرة .
2. - التدريبات والأنشطة في قاعة الدرس .
3- إرشاد الطلاب إلى بعض المصادر التي تحتوي على امثلة وتمارين للإفادة منها



3. بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
الاول	4	مقدمة عن الكترونيک القدرة	الكترونيک القدرة	نظري + مناقشة	اسئلة عامة ومناقشة
الثاني	4	مقدمة عن الكترونيک القدرة	الكترونيک القدرة	نظري + مناقشة	اسئلة عامة ومناقشة او امتحان اني
الثالث	4	اشباه الموصلات وخواصها.	الكترونيک القدرة	نظري + مناقشة	أسئلة عامة ومناقشة
الرابع	4	اشباه الموصلات وخواصها.	الكترونيک القدرة	نظري + مناقشة	امتحان اني
الخامس	4	محولات الفولتية المتناوبة الى مستمرة (المعدلات).	الكترونيک القدرة	نظري + مناقشة	أسئلة عامة ومناقشة او امتحان اني
السادس	4	محولات الفولتية المتناوبة الى مستمرة (المعدلات).	الكترونيک القدرة	نظري + مناقشة	اسئلة عامة و مناقشة
السابع	4		الكترونيک القدرة	نظري	امتحان نصف الفصل
الثامن	4	محولات الفولتية المستمرة الى فولتية متناوبة (العاكس).	الكترونيک القدرة	نظري + مناقشة	الواجبات الجماعية
التاسع	4	محولات الفولتية المستمرة الى فولتية متناوبة (العاكس).	الكترونيک القدرة	نظري + مناقشة	اسئلة عامة
العاشر	4	محولات الفولتية المستمرة الى فولتية مستمرة (DC TO DC)	الكترونيک القدرة	نظري + مناقشة	اسئلة عامة
الحادي عشر	4	محولات الفولتية المستمرة الى فولتية مستمرة (DC TO DC)	الكترونيک القدرة	نظري + مناقشة	اسئلة عامة
الثاني عشر	4	محولات الفولتية المتناوبة الى فولتية متناوبة (AC TO AC)	الكترونيک القدرة	نظري + مناقشة	مناقشة و امتحان اني
الثالث عشر	4	محولات الفولتية المتناوبة الى فولتية متناوبة (AC TO AC)	الكترونيک القدرة	نظري + مناقشة	اسئلة عامة
الرابع عشر	4	مراجعة عامة	الكترونيک القدرة	نظري + مناقشة	الواجبات الجماعية + مناقشة
الخامس عشر	4		الكترونيک القدرة	نظري	امتحان شهري

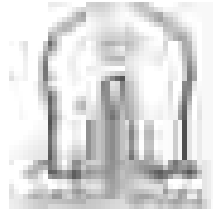


4. تقييم المقرر	
<ul style="list-style-type: none"> • المشاركة الفاعلة في قاعة الدرس دليل التزام الطالب وتحمله المسؤولية. • الالتزام بالموعد المحدد في تقديم الواجبات والبحوث. • تعبر الاختبارات الفصلية والنهائية عن الالتزام والتحصيل المعرفي والمهارى. <p style="text-align: right;">التطبيقات والتمارين والواجبات اليومية</p>	
5. مصادر التعلم والتدريس	
<p>1. Applied numerical analysis, Curtis F. Gerald and Patrick O. wheatley</p> <p>2. Chapra & Canale “Numerical Methods for Engineers”.</p> <p>3. Numerical analysis, purna Chandra Biswal</p>	الكتب المقررة المطلوبة (المنهجية أن وجدت)
<p>M.H.Rashid, ‘Power Electronics: Circuits, (1) Devices and Applications’, Pearson Education, PHI Third Edition, NewDelhi, 2004</p> <p>Power Electronics DanielW. Hart Valparaiso (2) University Valparaiso, Indian</p> <p>Interactive of Power Electronic (3)</p>	المراجع الرئيسة (المصادر)
	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)
	المراجع الإلكترونية ، مواقع الانترنت



استمارة وصف المقرر الدراسي

1.	اسم المقرر: تحليل نظام القدرة
2.	رمز المقرر: EE4426
3.	الفصل / السنة: الفصل 2-2025-2026
4.	تاريخ إعداد هذا الوصف : 2025/11/2
5.	أشكال الحضور المتاحة : حضوري
6.	عدد الساعات الدراسية (الكلي): 3 عدد الوحدات (الكلي): 3
7.	اسم مسؤول المقرر الدراسي (إذا اكثر من اسم يذكر) أ.م.د عمر كامل دحام العزاوي
8.	اهداف المقرر تعريف الطالب بمنظومة القدرة واستخراج متغيراتها لاعداده كي يكون مهندس قادر على تصميم وحساب كافة المتطلبات. إعداد الملاكات الهندسية في مجال الهندسة الكهربائية إعداد مهندسين أكفاء في تنفيذ المشاريع والصيانة تقديم الاستشارات والخبرات الهندسية . غرس اخلاقيات المهنة في نفوس الخرجين لتجنيبهم الفساد والانحراف
9.	استراتيجيات التعليم والتعلم الاختبارات اليومية المفاجئة والاسبوعية المستمرة . - التدريبات والأنشطة في قاعة الدرس . - إرشاد الطلاب إلى بعض المصادر التي تحتوي على امثلة وتمارين للإفادة منها

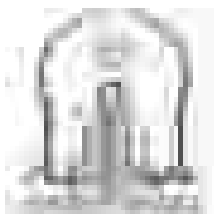


10. بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
الأول	3	roduction of power system analysis	Unit 1	نظري + مناقشة	اسئلة عامة ومناقشة
الثاني	3	Y-bus	Unit 1	نظري + مناقشة	اسئلة عامة ومناقشة امتحان اني
الثالث	3	ntroduction of load flow	Unit 2	نظري + مناقشة	أسئلة عامة ومناقشة
الرابع	3	Load flow	Unit 2	نظري + مناقشة	امتحان اني
الخامس	3	ewton Raphson method	Unit 2	نظري + مناقشة	أسئلة عامة ومناقشة امتحان
السادس	3	ulation of Newton Raphson method	Unit 2	نظري + مناقشة	اسئلة عامة و مناقشة
السابع	3	G.S method	Unit 2	نظري + مناقشة	اسئلة عامة
الثامن	3	ulation of G.S method	Unit 2	نظري + مناقشة	الواجبات الجماعية
التاسع	3	roduction of power system stability	Unit 3	نظري + مناقشة	اسئلة عامة
العاشر	3	Stady stat stability	Unit 3	نظري + مناقشة	امتحان شهري
الحادي عشر	3	ulation of study stat stability	Unit 3	نظري + مناقشة	اسئلة عامة
الثاني عشر	3	Transient stability	Unit 3	نظري + مناقشة	مناقشة و امتحان اني
الثالث عشر	3	ulation of study Transient stability	Unit 3	نظري + مناقشة	اسئلة عامة
الرابع عشر	3	Power system protection	Unit 3	نظري + مناقشة	الواجبات الجماعية+
					مناقشة

11. تقييم المقرر

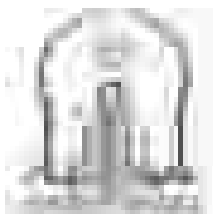


12. مصادر التعلم والتدريس	
(Elements of power systems analysis by Stevenson Modern power system	الكتب المقررة المطلوبة (المنهجية أن وجدت)
(Elements of power systems analysis by Stevenson Modern power system	المراجع الرئيسة (المصادر)
	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)
	المراجع الإلكترونية ، مواقع الانترنت

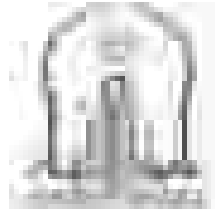


استمارة وصف المقرر الدراسي

1. اسم المقرر: طرق عددية
2. رمز المقرر: EE3211
3. الفصل / السنة: السنوي الفصل الاول / السنة الدراسية الرابعة 2025-2026
4. تاريخ إعداد هذا الوصف 1/12/2026
5. أشكال الحضور المتاحة : حضوري
6. عدد الساعات الدراسية (الكلي): 45 عدد الوحدات (الكلي): 3
7. اسم مسؤول المقرر الدراسي (إذا اكثر من اسم يذكر) أ.م. د. فلاح شلال خليفة f.sh.khalifa@uoanbar.edu.iq
8. اهداف المقرر
أ - الاستفاده من الخبرات الفنيه المطلقه على نظم الهندسه الكهربائيه وتخرج مهندسين اكفاء ب - للتفاعل بصوره حرفيه ومهنيه في بيئه الاعمال المعاصره من خلال الاتصال الفعال والعمل الجماعي ج - توضيح مفهوم الطرق العددية بأنواعها د- يهدف المقرر الى اعطاء الطالب خلفيه جديده يمكن الاستفاد منها عند دراسة هذه الطرق
9. استراتيجيات التعليم والتعلم
- الاختبارات اليومية المفاجئه والاسبوعية المستمرة - التدريبات والانشطة في قاعة الدرس - ارشاد الطلاب في بعض المصادر التي تحتوي على امثله وتمارين والاستفاده منها
10. بنية المقرر



الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
الأول	3	طرق عددية	Error analysis	نظري + مناقشة	اسئلة عامه ومناقشة
الثاني	3	طرق عددية	Roots of nonlinear algebraic equations.	نظري + مناقشة	اسئلة عامه وامتحان اني
الثالث	3	طرق عددية	Roots of nonlinear algebraic equations.	نظري + مناقشة	اسئلة عامه ومناقشة
الرابع	3	طرق عددية	Solution of linear and transcendental simultaneous equation	نظري + مناقشة	امتحان اني
الخامس	3	طرق عددية	Solution of linear equations	نظري + مناقشة	اسئلة عامه ومناقشة
السادس	3	طرق عددية	Matrix and vector manipulation	نظري + مناقشة	اسئلة ومناقشة
السابع	3	طرق عددية	Matrix and vector manipulation	نظري + مناقشة	اسئلة عامه
الثامن	3	طرق عددية	Curve fitting and interpolation.	نظري + مناقشة	الواجبات الجماعيه
التاسع	3	طرق عددية	Curve fitting and interpolation	نظري + مناقشة	اسئلته عامه
العاشر	3	طرق عددية	Numerical integration	نظري + مناقشة	امتحان شهري
الحادي عشر	3	طرق عددية	Numerical integration	نظري + مناقشة	اسئلة عامه
الثاني عشر	3	طرق عددية	Numerical differentiation	نظري + مناقشة	اسئلة عامه
الثالث عشر	3	طرق عددية	Numerical differentiation	نظري + مناقشة	مناقشة وامتحان
الرابع عشر	3	طرق عددية	Solution of differential equations	نظري + مناقشة	الواجبات الجماعية
الخامس عشر	3	طرق عددية		نظري	امتحان شهري

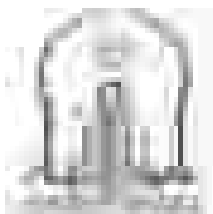


المشاركة في قاعة الدرس تقديم الأنشطة اختبارات شهرية ونهائية وأنشطة	
12. مصادر التعلم والتدريس	
1. Applied numerical analysis, Curtis F. Gerald and Patrick O. wheatley 2. Chapra & Canale “Numerical Methods for Engineers”. 3. Numerical analysis, purna Chandra Biswal	الكتب المقررة المطلوبة (المنهجية أن وجدت)
	المراجع الرئيسية (المصادر)
	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير)
	المراجع الإلكترونية ، مواقع الانترنت



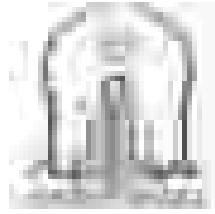
استمارة وصف المقرر الدراسي

1.	اسم المقرر: قدرة كهربائية 3
2.	رمز المقرر: EE 4336
3.	الفصل / السنة: الفصل
4.	تاريخ إعداد هذا الوصف : 2025/11/2
5.	أشكال الحضور المتاحة : حضوري
6.	عدد الساعات الدراسية (الكلي): 3 عدد الوحدات (الكلي): 3
7.	اسم مسؤول المقرر الدراسي (إذا اكثر من اسم يذكر) أ.م.د عمر كامل دحام العزاوي
8.	اهداف المقرر
	تعريف الطالب بمنظومة القدرة واستخراج متغيراتها لاعداده كي يكون مهندس قادر على تصميم وحساب كافة المنظلم إعداد الملاكات الهندسية في مجال الهندسة الكهر إعداد مهندسين أكفاء في تنفيذ المشاريع والص تقديم الاستشارات والخبرات الهندس غرس اخلاقيات المهنة في نفوس الخرجين لتجنبهم الفساد والاند
9.	استراتيجيات التعليم والتعلم
	الاختبارات اليومية المفاجئة والاسبوعية المستمرة . - التدريبات والأنشطة في قاعة الدرس . - إرشاد الطلاب إلى بعض المصادر التي تحتوي على امثلة وتمارين للإفادة منها

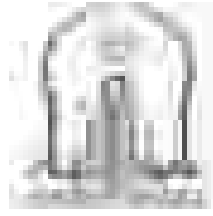


10. بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم
الأول	3	roduction of power system	Unit 1	نظري + مناقشة	اسئلة عامة ومناقشة
الثاني	3	Per unit system	Unit 1	نظري + مناقشة	اسئلة عامة ومناقشة امتحان اني
الثالث	3	Balanced fault	Unit 2	نظري + مناقشة	أسئلة عامة ومناقشة امتحان اني
الرابع	3	ulation of balance fault	Unit 2	نظري + مناقشة	أسئلة عامة ومناقشة امتحان
الخامس	3	Z- bus	Unit 3	نظري + مناقشة	اسئلة عامة و مناقشة
السادس	3	ymmetrical components	Unit 3	نظري + مناقشة	اسئلة عامة و مناقشة
السابع	3	ulation of ymmetrical components	Unit 3	نظري + مناقشة	اسئلة عامة
الثامن	3	unbalanced faults	Unit 3	نظري + مناقشة	الواجبات الجماعية
التاسع	3	L-G fault	Unit 3	نظري + مناقشة	اسئلة عامة
العاشر	3	L-L fault	Unit 3	نظري + مناقشة	امتحان شهري
الحادي عشر	3	L-L-G fault	Unit 3	نظري + مناقشة	اسئلة عامة
الثاني عشر	3	ulation of unbalanced faults	Unit 3	نظري + مناقشة	مناقشة و امتحان اني
الثالث عشر	3	ulation of unbalanced faults	Unit 3	نظري + مناقشة	اسئلة عامة
الرابع عشر	3	ulation of unbalanced faults	Unit 3	نظري + مناقشة	الواجبات الجماعية+
الخامس عشر	3	ulation of unbalanced faults	Unit 3	نظري + مناقشة	الواجبات الجماعية+

11. تقييم المقرر

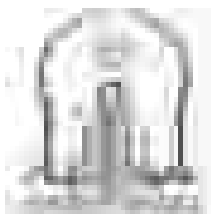


12. مصادر التعلم والتدريس	
(Elements of power systems analysis by Stevenson Modern power system	الكتب المقررة المطلوبة (المنهجية أن وجدت)
(Elements of power systems analysis by Stevenson Modern power system	المراجع الرئيسية (المصادر)
	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)
	المراجع الإلكترونية ، مواقع الانترنت



استمارة وصف المقرر الدراسي

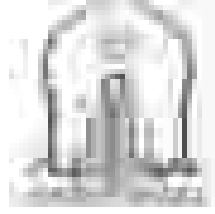
1. اسم المقرر: اتصالات متقدمة					
2. رمز المقرر: EE4335					
3. الفصل / السنة: الفصل الثاني - السنة الرابعة 2025 - 2026					
4. تاريخ إعداد هذا الوصف 2025-12-28					
5. أشكال الحضور المتاحة : دوام رسمي حضوري					
6. عدد الساعات الدراسية (الكلي): 45 عدد الوحدات (الكلي): 45					
7. اسم مسؤول المقرر الدراسي (إذا اكثر من اسم يذكر) - ا.م.د. نصر فرحان عبدالله					
8. اهداف المقرر					
1. اكتساب الطالب مهارة التعامل مع أنظمة تضمين واستخلاص الاشارات بتقنية الطيف المنتشر .					
2. توضيح مفاهيم أنظمة الاتصالات المتقدمة كالأقمار الصناعية و أنظمة تحديد المواقع والرادارات.					
3. يهدف المقرر الى دراسة تطبيقات أنظمة الاتصالات المتقدمة المذكورة اعلاه.					
4. يهدف المقرر الى اعطاء الطالب خلفية جديدة يمكنه الاستفادة منها عند عمل مشروع او بحث عن تلك الانظمة.					
9. استراتيجيات التعليم والتعلم					
- الاختبارات اليومية المفاجئة والاسبوعية المستمرة.					
- التدريبات والأنشطة في قاعة الدرس.					
- إرشاد الطلاب إلى بعض المصادر التي تحتوي على امثلة وتمارين للإفادة منها.					
10. بنية المقرر					
الأسبوع	الساعات	مخرجات التعلم المطلوبة	اسم الوحدة او الموضوع	طريقة التعلم	طريقة التقييم



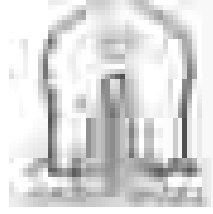
اسئلة عامة ومناقشة	نظري + مناقشة	شرح عملية تضمين واستخلاص الاشارة باستخدام طريقة التسلسل المباشر	Direct Sequence Spread Spectrum	3	الأول
اسئلة عامة ومناقشة	نظري + مناقشة	شرح عملية تضمين واستخلاص الاشارة باستخدام طريقة القفز المتكرر	Frequency Hopping Spread Spectrum	3	الثاني
مناقشة	نظري + مناقشة	حل اسئلة متعلقة بموضوع الطيف المنخفض	Advantages Of Spread Spectrum	3	الثالث
امتحان اني عامة ومناقشة	نظري + مناقشة	شرح عملية توليد الرقم العشوائي الزائف	Pseudo Random Number Generation	3	الرابع
أسئلة عامة ومناقشة او امتحان اني	نظري + مناقشة	شرح عملية التضمين واستخلاص الاشارة بطريقة الطيف المنتشر و باستخدام العشوائي الزائف	Spread Spectrum Scenarios	3	الخامس
امتحان شهري	نظري + مناقشة	شرح فوائد استخدام الرقم العشوائي و حمايته للاشارة من الضوضاء	Advantages, Jamming/Noise Pseudo Immunity Noise	3	السادس
مناقشة مع لعم واجبات جماعية	نظري + مناقشة	اعطاء اسئلة متعلقة باستخدام العشوائي الزائف في ارسال واستقبال الاشارات	Advantages Of Pseudo Noise	3	السابع
اسئلة عامة ومناقشة	نظري + مناقشة	اعطاء مقدمة عن الاقمار الصناعية وانواعها و مبادئها	Introduction Of Satellite Communications	3	الثامن
اسئلة عامة	نظري + مناقشة	شرح تطبيقات الاقمار الصناعية	Satellite Applications	3	التاسع
اسئلة عامة ومناقشة	نظري + مناقشة	شرح عملية نقل الاشارات من الى الارض الصناعية	Uplink/Downlink Propagation	3	العاشر
امتحان شهري	نظري + مناقشة	شرح انواع مدارات الاقمار الصناعية مسائل متعلقة بالموضوع	Orbits Of Satellites	3	الحادي عشر
اسئلة عامة ومناقشة	نظري + مناقشة	خسائر الاشارة	Path Loss and Link budget	3	الثاني عشر
اسئلة عامة	نظري + مناقشة	اعطاء مقدمة عن الرادارات وانواعها و دقتها	Introduction To RADAR Systems	3	الثالث عشر
الواجبات الجماعية + مناقشة	نظري + مناقشة	شرح هيكله الجزء المرسل و المستقبل بنظام تحديد المواقع	Transmitter & Receiver Architecture	3	الرابع عشر
اسئلة عامة ومناقشة	نظري + مناقشة	شرح اساسيات نظام تحديد المواقع اقسامها و الجزء المتحكم و المستخدم	Fundamental Of GPS System (Space, Control, User) Segment	3	الخامس عشر

11. تقييم المقرر

- المشاركة في قاعة الدرس.
- تقديم الأنشطة
- اختبارات يومية وفصلية ونهائية.

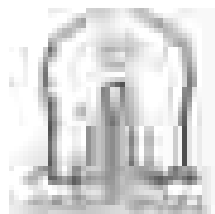


12. مصادر التعلم والتدريس	
	الكتب المقررة المطلوبة (المنهجية أن وجدت)
<ul style="list-style-type: none">• Communication-Systems 4ed by Haykin• Satellite Communications- 4th Edition by Dennis Roddy	المراجع الرئيسة (المصادر)
	الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)
	المراجع الإلكترونية ، مواقع الانترنت

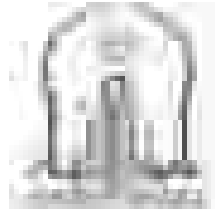


استمارة وصف المقرر الدراسي

1.	اسم المقرر: نظرية معلومات
2.	رمز المقرر: EE4334
3.	الفصل / السنة: الفصل الأول - السنة الرابعة 2025 - 2026
4.	تاريخ إعداد هذا الوصف 2025-12-28
5.	أشكال الحضور المتاحة : دوام رسمي حضوري
6.	عدد الساعات الدراسية (الكلي): 45 عدد الوحدات (الكلي): 45
7.	اسم مسؤول المقرر الدراسي (إذا اكثر من اسم يذكر) - ا.م.د. نصر فرحان عبدالله
8.	اهداف المقرر
9.	استراتيجيات التعليم والتعلم
10.	بنية المقرر



طريقة التقييم	طريقة التعلم	اسم الوحدة او الموضوع	مخرجات التعلم المطلوبة	الساعات	الأسبوع
اسئلة عامة ومناقشة	نظري + مناقشة	نظرية معلومات	del of communication system, Elements of a digital communication system	3	الأول
اسئلة عامة ومناقشة او امتحان اني	نظري + مناقشة	=	asure of Information, Information content of message, Average information content [Entropy]	3	الثاني
أسئلة عامة ومناقشة	نظري + مناقشة	=	ropy & information theory of Markov source, Encoding of the source output.	3	الثالث
امتحان اني	نظري + مناقشة	=	annon's Encoding Algorithm	3	الرابع
أسئلة عامة ومناقشة او امتحان اني	نظري + مناقشة	=	o Encoding Algorithm	3	الخامس
اسئلة عامة و مناقشة	نظري + مناقشة	=	uffman Encoding Algorithm	3	السادس
اسئلة عامة	نظري + مناقشة	=	LZ Algorithm	3	السابع
الواجبات الجماعية	نظري + مناقشة	=	annels, capacity of discrete memoryless channel	3	الثامن
اسئلة عامة	نظري + مناقشة	=	Channel analysis	3	التاسع
امتحان شهري	نظري + مناقشة	=	Examples	3	العاشر
اسئلة عامة	نظري + مناقشة	=	or detection & correction	3	الحادي عشر
مناقشة و امتحان	نظري + مناقشة	=	ar block codes for correction & detection)	3	الثاني عشر
اسئلة عامة	نظري + مناقشة	=	ary cyclic codes syndrome calculation for detection & error correction)	3	الثالث عشر
الواجبات الجماعية + مناقشة	نظري + مناقشة	=	Examples	3	الرابع عشر
امتحان شهري	نظري + مناقشة	=	volutional codes coding, decoding (performance),	3	الخامس عشر



			viterbi algorithm ptimum decoding),		
11. تقييم المقرر					
<ul style="list-style-type: none"> • المشاركة في قاعة الدرس. • تقديم الأنشطة • اختبارات يومية وفصلية ونهائية. 					
12. مصادر التعلم والتدريس					
الكتب المقررة المطلوبة (المنهجية أن وجدت)					
المراجع الرئيسية (المصادر)					
<ul style="list-style-type: none"> • S. Haykin; “Communication Systems”, 4th ed. • Glavieux, “Channel Coding in Communication Networks”, ISTE, 2007. 					
الكتب والمراجع الساندة التي يوصى بها (المجلات العلمية، التقارير....)					
المراجع الإلكترونية ، مواقع الانترنت					