



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



استمارة وصف البرنامج الأكاديمي للكلية للعام الدراسي 2025-2026

الكلية: كلية العراق الجامعة

الأقسام والفروع العلمية في الكلية: 13

تاريخ ملء الملف: 29-06-2026

ممثل وحدة ضمان الجودة في القسم

م.د. عبدالوهاب عيسى حمزه

رئيس القسم

أ.د. زكي عبدالله احمد

مدير وحدة ضمان الجودة والاعتماد

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وزارة التعليم العالي والبحث العلمي
كلية العراق الجامعة
قسم هندسة الاتصالات



**Ministry of Higher Education and Scientific Research
Iraq University College
Department of Communications Engineering**

وصف البرنامج الأكاديمي والمقررات الدراسية

Academic Program description and courses

العام الدراسي 2025-2026

نموذج وصف البرنامج الأكاديمي

مراجعة اداء مؤسسات التعليم العالي [مراجعة البرنامج الأكاديمي]

وصف البرنامج الأكاديمي

صمم البرنامج الأكاديمي لهندسة الاتصالات لاعداد مهندسين مؤهلين لديهم القدرة على تطبيق المعرفة النظرية والتطبيق العلمي . تم اعداد هذا البرنامج لتطوير المعارف ، والمهارات ، والقدرات الاساسية الضرورية للممارسة المهنية والدراسات العليا .

1. اسم المؤسسة التعليمية	كلية العراق الجامعة
2. القسم الجامعي / المركز	قسم هندسة الاتصالات
3. اسم البرنامج الأكاديمي	بكالوريوس هندسة الاتصالات
4. اسم الشهادة النهائية	بكالوريوس علوم في هندسة الاتصالات
5. النظام الدراسي	فصلي + نظام بولونيا
6. برنامج الاعتماد المعتمد	
7. المؤثرات الخارجية الاخرى	المختبرات، المكتبات، الورش وندوات
8. تاريخ اعداد الوصف	2025/1/5
9. اهداف البرنامج الأكاديمي	

تم استحداث قسم هندسة الاتصالات في العام الدراسي 2005 / 2006 ويعتبر من الاقسام الهندسة الرائدة على مستوى التعليم العالي الاهلي في العراق. يهدف القسم الى تخريج مهندس باختصاص اتصالات يتمتع بمؤهلات علمية ومهنية في مجال أنظمة الاتصالات الرقمية والتماتلية وشبكات الحواسيب. ويتمتع بمهارات متعدد وخلفية علمية تمكنه من التعامل مع مختلف مستجدات التخصص وقادر على التكيف مع ظروف العمل المختلفة. يمتلك اساسات ادارة المشاريع. يمتلك ثقافة العمل الجماعي بروح الفريق الواحد.

10. مخرجات التعلم المطلوبة وطرائق التعليم والتعلم والتقييم

طرائق التقييم	طرائق التعليم والتعلم	مخرج التعلم
امتحانات ، مهام ، واجبات يومّة ، مناقشات ، تقارير مختبرية ، ومشاريع تخرج	محاضرات نظري وعلمي ، وتطبيقي ، و واجبات يومية ، والمناقشات.	أ- المعرفة والفهم أ 1- المقدرة على تطبيق المعرفة في الرياضيات والعلوم والهندسة أ 2- المقدرة على تعريف، وصياغة ، وحل المشاكل الهندسية
		ب - المهارات الخاصة بالموضوع ب 1- القدرة على تصميم وتنفيذ التجارب ، بالاضافة الى تفسير وتحليل البيانات ب 2- القدرة على تصميم نظام ، او وحدة او معالج لتحقيق الهدف المنشود بشكل عملي و على ارض الواقع في المجالات الاقتصادية ، والبيئية ، والاجتماعية ، والاخلاقية ، والصحية ، وفي مجال التصنيع والادامة
امتحانات ، مهام ، واجبات يومّة ، مناقشات ، تقارير مختبرية ، ومشاريع تخرج	محاضرات نظري وعلمي ، وتطبيقي ، و واجبات يومية ، والمناقشات.	ج- مهارات التفكير ج 1- القدرة على استخدام التقنيات ، والمهارات ، والادوات الهندسية الحديثة الضرورية لممارسة الهندسة. ج 2- فهم المسؤولية الاخلاقية والمهنية
		د- المهارات العامة والمنقولة (مهارات الاخرى المتعلقة بقابلية التوظيف والتطوير الشخصي).

امتحانات ، مهام ، واجبات يومّة ، مناقشات ، تقارير مختبرية ، ومشروع تخرج	المحاضرات ، التجارب العملية ، والتطبيقات ، والواجبات المنزلية والمناقشات العلمية .	1- القدرة على العمل في فريق متعدد الاختصاصات 2- القدرة على التواصل البناء.
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11. بنية البرنامج



Iraq University Collage

Communication Engineering



كلية العراق الجامعة

هندسة الاتصالات

Iraq University College				كلية العراق الجامعة			
Bachelor's level (First cycle) - Honors Bachelor Degree in Communication Engineering				مستوى البكالوريوس (الدورة الأولى) - بكالوريوس مع مرتبة الشرف في هندسة الاتصالات			
Four years (Eight Semesters) - 240 ECTS credits - 1 ECTS = 25hr				أربع سنوات (ثمانية فصول دراسية) - 240 وحدة أوروبية - كل وحدة أوروبية = 25 ساعة			
Program Curriculum (2025 - 2026)				المناهج الدراسية للعام 2025 - 2026			

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
UGI	One	1	E 101	Mathematics I	الرياضيات I	English	4				1		3	78	72	150	6	B	
		2	COE 101	Electrical Engineering Fundamentals I	أساس الهندسة الكهربائية I	English	4		2		2		4	124	76	200	8	C	
		3	COE 103	Digital techniques	التقنيات الرقمية	English	4		2				3	93	57	150	6	C	
		4	COE 106	Engineering Drawing	الرسم الهندسي	English	0			3			3	48	52	100	4	B	
		5	U 103	Computer Skills	مهارات الحاسوب	English	1		3				4	64	36	100	4	B	
		6	U 104	English Language	اللغة الانكليزية	English	2						3	33	17	50	2	B	
						Total	15	0	7	3	3	0	20	440	310	750	30		
	Two	1	E 102	Mathematics II	الرياضيات II	English	4				1		3	78	72	150	6	B	
		2	COE 102	Electrical Engineering Fundamentals II	أساس الهندسة الكهربائية II	English	4		2		2		4	124	76	200	8	C	
		3	COE 104	Electronic Physics	الفيزياء الالكترونية	English	4				1		3	78	72	150	6	C	
		4	COE 105	C++ Programming	برمجة C++	English	1		3				4	64	61	125	5	C	
		5	COE 107	Workshops skills	المهارات الهندسية	Arabic	0			3			3	48	27	75	3	B	
		6	U 101	Human Rights and Democracy	حقوق الانسان والديمقراطية	Arabic	2						3	33	17	50	2	B	
						Total	15	0	5	3	4	0	20	425	325	750	30		

Iraq University College				كلية العراق الجامعة			
Bachelor's level (First cycle) - Honors Bachelor Degree in Communication Engineering				مستوى البكالوريوس (الدورة الأولى) - بكالوريوس مع مرتبة الشرف في هندسة الاتصالات			
Four years (Eight Semesters) - 240 ECTS credits - 1 ECTS = 25hr				أربع سنوات (ثمانية فصول دراسية) - 240 وحدة أوروبية - كل وحدة أوروبية = 25 ساعة			
Program Curriculum (2026 - 2025)				المناهج الدراسية للعام 2026 - 2025			

Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL	USSWL	SWL	ECTS	Module Type	Prerequisite Module(s) Code
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semn (hr/w)		hr/sem	hr/sem	hr/sem			
UGII	One	1	COE 201	Signals and systems	إشارات ونظم	English	2		2		1		3	78	72	150	6	C	
		2	COE 202	Applied mathematics I	رياضيات تطبيقية I	English	2				1		3	48	27	75	3	C	
		3	COE 203	Electrical circuits	دوائر كهربائية	English	4		2		1		3	108	42	150	6	C	
		4	COE 204	Electronic I	إلكترونيات I	English	3		2		1		3	93	57	150	6	C	
		5	COE 205	MatLab Programming	برمجة ماتلاب	English	1		2				3	48	27	75	3	C	
		6	COE 206	Electromagnetic fields I	مجالات كهرومغناطيسية I	English	2				1		3	48	52	100	4	C	
		7	UD24	Ba'ath Regime Crimes in Iraq	جرائم نظام البعث في العراق	Arabic	2						3	33	17	50	2	B	
						Total	16	0	8	0	5	0	21	456	294	750	30		
	Two	1	COE 207	Analog communication	اتصالات تماثلية	English	3		2		1		3	93	32	125	5	C	COE 201
		2	COE 208	Applied Mathematics II	رياضيات تطبيقية II	English	2				1		3	48	52	100	4	C	COE 202
		3	COE 209	Electronic II	إلكترونيات II	English	3		2		1		3	93	32	125	5	C	COE 204
		4	COE 210	Probability and random processing	الاحتمالية والعمليات العشوائية	English	4				1		3	78	47	125	5	C	
		5	COE 211	Electromagnetic fields II	مجالات كهرومغناطيسية II	English	2				1		3	48	52	100	4	C	COE 206
		6	UD23	Computer 2	حاسوب 2	English	1		2				3	48	27	75	3	B	
		7	UD22	Arabic Language 2	لغة عربية 2	Arabic	2						3	33	17	50	2	B	
		8	UD21	English Language 2	لغة انكليزية 2	English	2						3	33	17	50	2	B	
						Total	19	0	6	0	5	0	24	474	276	750	30		

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Iraq University College																			كلية العراق الجامعة						
Bachelor's level (First cycle) - Honors Bachelor Degree in Communication Engineering																			مستوى البكالوريوس (الدورة الأولى) - بكالوريوس مع مرتبة الشرف في هندسة الاتصالات						
Four years (Eight Semesters) - 240 ECTS credits - 1 ECTS = 25hr																			أربع سنوات (ثمانية فصول دراسية) - 240 وحدة ائتمانية - كل وحدة ائتمانية = 25 ساعة						
Program Curriculum 2025 - 2026																			المنهاج الدراسي للعام 2025 - 2026						
Level	Semester	No.	Module Code	Module Name in English	اسم المادة الدراسية	Language	SSWL (hr/w)						Exam hr/sem	SSWL hr/sem	USSWL hr/sem	SWL hr/sem	ECTS	Module Type	Prerequisite Module(s) Code						
							CL (hr/w)	Lect (hr/w)	Lab (hr/w)	Pr (hr/w)	Tut (hr/w)	Semr (hr/w)													
One		1	COE 301	Digital Signal Processing	معالجة إشارة رقمية	English	2		2		1		3	78	47	125	5	C							
		2	COE 302	Digital Communications I	الاتصالات رقمية I	English	2		2		1		3	78	72	150	6	C							
		3	COE 303	Antennas Theory	نظرية الهوائيات	English	3		2		1		3	93	32	125	5	C							
		4	COE 304	Computer Networks	شبكات الحاسوب	English	2		2				3	63	12	75	3	C							
		5	COE 305	Engineering Analyses	تحليلات هندسية	English	4				2		3	93	32	125	5	C							
		6	COE 306	Control Theory	نظرية السيطرة	English	2						3	33	42	75	3	C							
		7	COE 307	Laser Principles	اساسيات الليزر	English	2						3	33	42	75	3	C							
						Total	17	0	8	0	5	0	21	471	279	750	30								
UGIII	Two	1	COE 308	Digital Image Processing	معالجة الصور الرقمية	English	2		2		1		3	78	22	100	4	C							
		2	COE 309	Digital Communications II	الاتصالات رقمية II	English	2		2		1		3	78	47	125	5	C	COE 302						
		3	COE 310	Radio Wave Propagation	انتشار موجات راديوية	English	3						3	48	52	100	4	C	COE 303						
		4	COE 311	Cyber Security	امن سيبراني	English	2		2				3	63	12	75	3	C							
		5	COE 312	Information Theory and Coding	نظرية المعلومات والترميز	English	3				2		3	78	47	125	5	C							
		6	COE 313	Microcontroller	المسيطر الدقيق	English	2		2				3	63	12	75	3	C							
		7	COE 314	Optical Communications	الاتصالات بصرية	English	2		2				3	63	37	100	4	C							
		8	UD33	Arabic Language 2	لغة عربية 2	Arabic	2						3	33	17	50	2	B							
						Total	16	0	10	0	4	0	21	504	246	750	30								

المرحلة الرابعة / الفصل الدراسي الاول

		Th	T	Pr	s	
1	Digital Signal Processing I معالجة الإشارة الرقمية I	2	1	2	5	3
2	Control Engineering I هندسة تحكم I	2	1	2	5	3
3	Mobile Communication I الاتصالات المتنقلة I	2	1	2	5	3
4	Microwave Technology تقنية الموجة الدقيقة	2	1	2	5	3
5	Network Design and Security تصميم وامنية الشبكة	2	1	-	3	2
6	Antenna هوائيات	2	1	-	3	2
7	Project مشروع	2	-	2	4	3
Total		14	6	10	30	19

السنة
الرابعة

المرحلة الرابعة / الفصل الدراسي الثاني

		Th	T	Pr	s	
1	Digital Signal Processing II معالجة الإشارة الرقمية II	2	1	2	5	3
2	Control Engineering II هندسة التحكم II	2	1	2	5	3
3	Mobile Communications II اتصالات المتنقلة II	2	1	2	5	3
4	Satellite Communications اتصالات الاقمار الصناعية	2	1	-	3	2
5	Optical Communications اتصالات بصرية	2	1	-	3	2
6	Project مشروع	2	-	2	4	3
Total		12	5	8	25	16



215 وحدة	درجة البكالوريوس تتطلب (س) ساعة معتمدة	الشهادات والساعات المعتمدة
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12. التخطيط للتطور الشخصي
نشاط لاصفي
13. معيار القبول (وضع الانظمة المتعلقة بالالتحاق بالكلية او المعهد)
القبول المركزي في وزارة التعلّم العالّ والبحث العلم
14. اهم مصادر المعلومات عن البرنامج
دليل الطالب للقبول المركزي المعد من قبل وزارة التعلّم العالّ والبحث العلم



المرحلة الاولى

1

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Mathematics I

Module Information معلومات المادة الدراسية			
Module Title	Mathematics I		Module Delivery
Module Type	Basic		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	E 101		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI	Semester (s) offered	
Administering Department	All Departments	College	College of Engineering
Module Leader	م.م. منتهى حسين	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Review Committee Approval	10/6/2023	Version Number	1.0

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes, Indicative Contents and Brief Description أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر			
Module Aims أهداف المادة الدراسية	This module aims to provide students with an understanding of, and competence in the use of, mathematical techniques that are relevant to the solution of engineering problems. It will also give students a firm foundation from which to develop solutions to a wider and deeper range of engineering problems that they will encounter throughout their undergraduate engineering program of study.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Preliminaries : Explain mathematical coordinate systems, representing line, slope of line, shifting of lines 2. Vectors: Demonstrate an understanding of vectors in plane and space. 3. Function: Demonstrate an understanding of function and related variables, range and domain of function, types of functions and their graphs. 4. Limits and Continuity: Demonstrate an understanding of the fundamental concepts of calculus including limits, continuity, and differentiability. 5. Derivatives: Apply the techniques of differentiation at different types of functions including transcendental functions 6. Applications of derivatives: Apply the techniques of differentiation to solve problems involving rates of change, linearization, curve sketching, mean value theorem and Initial value problem. 7. Complex numbers: Demonstrate an understanding of complex numbers with		

	basic operations and their mathematical and graphical representations including Euler's Formula
Indicative Contents المحتويات الإرشادية	The topics listed under the indicative content below are the underpinning areas of knowledge and understanding that will be obtained from successful completion of the module. The mathematical topics are illustrated in the context of relevant engineering scenarios. • Preliminaries Cartesian coordinates, polar coordinates, slope of lines, angle of inclination. • Functions, types of functions, graph of the functions, domain and range of function • Review of trigonometric function: graph of trigonometric function, range and domain of trigonometric functions, identities. • Limits and Continuity: Properties, limits involving infinity, continuity. • Transcendental functions: Inverse function, graph of inverse function, Logarithmic and exponential functions, inverse trigonometric functions, hyperbolic functions, inverse hyperbolic functions. • Derivatives: Definition, rules of derivative, Implicit differentiation, L hospital's rule, derivative of inverse functions • Applications of derivatives: rate of change problems, Relative maximum and relative minimum, Curve sketching with 1st and 2nd derivative, Linearization, Mean value theorem, Initial value problem,. • Complex numbers: Basic definitions. The geometric representations of the complex numbers, argand diagram, Basic operations with complex numbers, Euler's Formula • Vectors: Introduction to vectors
Course Description	This course lays the foundation for a robust understanding of mathematical concepts that underpin the various disciplines within engineering. It covers a breadth of topics ranging from coordinate systems, slopes of lines, and angles of inclination to the introduction of two- and three-dimensional coordinate systems. A focus is also given to the understanding and manipulation of functions, including domain and range determination and function composition. The course incorporates a substantial overview of trigonometry, limits, continuity, derivatives, including their applications in real-world engineering contexts in addition to complex numbers and their mathematical representation. By the end of the course, students will have a sound understanding of these principles, preparing them for more advanced engineering courses in their respective fields.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Begin In Mathematics I, then employ a range of teaching strategies to ensure first-year engineering students fully grasp the various mathematical concepts. Instructional methods include interactive lectures, where core mathematical principles are explained in detail, and practical problem-solving sessions to provide hands-on learning experiences. Collaborative group work encourages peer-to-peer learning and reinforces understanding through shared insights. Regular formative assessments will be conducted to monitor students' understanding of the material, and feedback will be promptly given to guide their learning process. Instructors will maintain office hours for personalized support, and online resources will be available to supplement classroom instruction. Emphasis will be placed on relating mathematical concepts to real-world engineering applications to make the learning experience more relevant and engaging. These strategies aim to develop students' critical thinking skills, enhance their problem-solving abilities, and prepare them for advanced engineering studies.



الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time (hr)	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	3	20% (20)	3,5, 10, 12, 14	LO #1, 2, 3, 4, 5 and 7
	Assignments	6	10% (10)	4, 8, 12	LO # 1, 2, 3, 4, 5 and 6
	Home Work	6	10% (10)	2,5,7,9,11,13	LO # 1, 2, 3, 4, 5,6 and 7
Summative assessment	Midterm Exam	2	10% (10)	7	LO # 1,4
	Final Exam	3	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

Week	Material Covered
Week 1	Cartesian coordinates, slope of lines, angle of inclination, functions, types of functions, graph of the functions, domain and range ,identifying functions, Circles and parabolas
Week 2	Introduction to vectors
Week 3	•Preliminaries Sum, differences, products and quotients of Composite functions, shifting a graph of a function, scaling and reflecting a graph of a function, Absolute value
Week 4	•Review of trigonometric function graph of trigonometric function, range and domain, identities
Week 5	•Limits and Continuity Properties, limits involving infinity, continuity
Week 6	•Transcendental functions Inverse function, graph of inverse function, Logarithmic and exponential functions, trigonometric functions , inverse trigonometric functions, hyperbolic functions, inverse hyperbolic functions
Week 7	•Derivatives Definition, rules of derivative, slopes , tangent lines, chain rule, derivative of trigonometric functions, Implicit differentiation, L hospital's rule
Week 8	derivative of inverse trigonometric functions, derivative of exponential and logarithmic functions
Week 9	•Applications of derivatives Speed and acceleration, Relative maximum and relative minimum



Week 10	Curve sketching with 1st and 2nd derivative
Week 11	Linearization
Week 12	rate of change problems
Week 13	Mean value theorem -Initial value problem
Week 14	Complex numbers: Basic definitions. The geometric representations of the complex numbers, argand diagram
Week 15	Basic operations with complex numbers, Euler's Formula
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	George B. Thomas and Ross L. Finney, "Calculus and Analytic Geometry, Addison- Wesley	Yes
Recommended Texts	Thomas Calculus, by George B. Thomas, Jr, Eleventh Edition Media Upgrade 2008 Calculus Early Transcendental (Sixth Edition) James Stewart	Yes
Websites		

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB 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

Electrical Engineering Fundamentals I

Module Information معلومات المادة الدراسية			
Module Title	Electrical Engineering Fundamentals I		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 101		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	UGx11 UGI	Semester of Delivery	1
Administering Department	BSc – COMM	College	College of Engineering
Module Leader	م.م. داخل اسماعيل	e-mail	E-mail:
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	12/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. This course deals with the basic concept of electrical circuits. 2. This is the basic subject for all electrical and electronic circuits. 3. To understand voltage, current and power from a given circuit. 4. To develop problem solving skills and understanding of circuit theory through the application of techniques. 5. To understand Kirchhoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis. 7. To perform Maximum Power Transfer and reciprocity theorems 8. To understand Magnetic Circuits
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	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. 12. Understanding Maximum Power Transfer and reciprocity theorems 13. Understanding Magnetic Circuits
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - Basic Concepts Introduction, Systems of Units, Charge and Current, Voltage, Power and Energy, Circuit Elements [18 hrs] Part B - Basic Laws Ohm's Law, Nodes, Branches, and Loops, Kirchhoff's Laws, Series Resistors and Voltage Division, Parallel Resistors and Current Division, Wye-Delta Transformations. [15 hrs] Part C - Methods of Analysis Nodal Analysis, Nodal Analysis with Voltage Sources, Mesh Analysis, Mesh Analysis with Current Sources [12 hrs] Part D - Circuit Theorems Superposition, Source Transformation, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer [24 hrs] Revision problem classes [6 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Behavior management Behavior management strategies foster an atmosphere of mutual respect, reduce disruptive behavior and ensure students have an equal opportunity to fulfill their potential in the classroom. It's crucial to provide them with both a positive and productive learning environment. Examples include establishing a reward system with an interactive chart where students move up or down depending on their performance and behavior in class. 2. Blended learning With a blended learning teaching strategy, technology is incorporated with traditional learning. This allows students to work at their own pace, research their ideas and become more physically engaged during lessons. Examples include providing interactive tablets or whiteboards with engaging activities and posting classwork online for easier access. 3. Cooperative learning Group work is a cooperative learning strategy that allows students with various learning levels to work together. By encouraging them to express their own ideas and listen to others' ideas as a group, you help students develop communication and critical thinking skills. Examples include solving math puzzles together, performing skits as a team or working on group presentations. 4. Formative assessment A formative assessment is used periodically to monitor student learning incrementally. This can more effectively measure the process of learning as opposed to end-of-unit tests and can help you to improve your teaching methods throughout the year. Examples of this teaching strategy include self-evaluation exercises and summarizing a topic in multiple ways. 5. Student-led teaching The student-led teaching strategy lets students become the teacher. In a classroom with learners at different levels, you can better engage those learning faster by showing them how to teach and give feedback to their peers. They may team-teach or work in groups to teach a new topic. Examples include letting a student teach an entire lesson or having
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advanced writers lead a peer-editing session as well as provide constructive criticism.

Student Workload (SWL)

اسبوعا 15 الحمل الدراسي للطلاب محسوب لـ

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	124	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	8
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	76	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 12	LO #1, #4 and #8, #11
	Assignments	2	10% (10)	3 and 13	LO #3, #4 and #10, #14
	Projects / Lab. Report	1	10% (10)	Continuous	All
		1	10% (10)	14	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	8	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	- Electrical Engineering: An Overview - The International System of Units conversions (metric prefixes) - Free electrons, electric charge & types of electric materials - Definition of: electric current, electric current flowing through a conductor, electric voltage
Week 2	- Polarity of electric voltage across an element - The difference between electric potentials and electric voltage - Linear and non-linear elements: resistances, conductance, capacitances, and inductances - Definition of: Power and energy, Sources (Independent Source & Dependent Source)
Week 3	- Ohm's Law - Definition of: Nodes, Branches, and Loops
Week 4	- Series & parallel connections of resistors - Series Resistors and Voltage Division - Parallel Resistors and Current Division
Week 5	- Short and Open Circuits - Star-Delta Transformations
Week 6	Kirchhoff's Laws
Week 7	Methods of Analysis: Nodal Analysis
Week 8	Mid-term Exam
Week 9	Methods of Analysis: Mesh Analysis
Week 10	Circuit Theorems: Superposition, Source Transformation
Week 11	Circuit Theorems: Source Transformation
Week 12	Circuit Theorems: Thevenin's Theorem

Week 13	Circuit Theorems: Norton's Theorem, Derivations of Thevenin's and Norton's Theorems
Week 14	- Circuit Theorems: Maximum Power Transfer Theorem - Millman's Theorem, Substitution Theorem, Reciprocity Theorem
Week 15	Magnetic Circuits: Definitions, Composite Series Magnetic Circuit, Ampere-turns , Comparison Between Magnetic and Electric Circuits, Parallel Magnetic Circuits, Series-Parallel Magnetic Circuits, Leakage Flux and Hopkinson's Leakage Coefficient, Magnetization Curves.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المناهج الأسبوعي للمختبر

Week	Material Covered
Week 1	Lab 1: Introduction to Lab. Equipment's and How to use Avometer
Week 2	Lab 2: How to measure DC Voltage, current, power and resistor
Week 3	Lab 3: Resistor Color Code
Week 4	Lab 4: Ohm's Law
Week 5	Lab 5: Series, parallel and series- parallel circuits
Week 6	Lab 6: Star-Delta Transformations
Week 7	Lab 7: Kirchhoff's Voltage and Current Laws
Week 8	Lab 8: Nodal Analysis
Week 9	Lab 9: Mesh Analysis
Week 10	Lab 10: Superposition theorems
Week 11	Lab 11: Thevenin's theorems
Week 12	Lab 12: Norton's theorems
Week 13	Lab 13: Maximum Power Transfer Theorem
Week 14	Lab 14: Composite Series Magnetic Circuit
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Theraja, B. L. A Textbook of Electrical Technology- Volume I (Basic Electrical Engineering). Vol. 1. S. Chand Publishing, 2005. - C.K. Alexander and M.N.O Sadiku, Fundamentals of Electric Circuits, McGraw-Hill Education, Fifth Edition, 2013	Yes
Recommended Texts	- Allan H. Robbins and Wilhelm C. Miller, Circuit analysis: Theory and practice, Cengage Learning, Fifth Edition, 2013. - Nilsson, James William, Electric circuits, Pearson Education India, 2008.	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

Digital Techniques

Module Information معلومات المادة الدراسية			
Module Title	Digital Techniques		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 103		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGx11 UGI	Semester of Delivery	
Administering Department	BSc – COMM	College	College of Engineering
Module Leader	م.م. بتول عبدالله	e-mail	E-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	12/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To acquire the basic knowledge of Digital techniques levels and application of knowledge to understand digital electronics circuits. 2. Have a thorough understanding of the fundamental concepts and techniques used in digital electronics 3. To understand and examine the structure of various number systems and its application in digital design. 4. The ability to understand, analyze and design various combinational and sequential circuits. 5. Ability to identify basic requirements for a design application and propose a cost effective solution. 6. To prepare students to perform the analysis and design of various digital electronic circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 1. express basic concepts and logic circuits 2. Explains number systems and convert number systems. 3. explains logical AND,OR,NOT,NAND,NOR,EX-OR,EX-NOR functions 4. can show the simplification of logical statements 5. explains the simplification of logical statements with using Boolean rules and de-Morgan theorems 6. Writes Boolean equation by using truth table and shows its logic circuits. 7. Writes Boolean equation by logic circuits and shows its truth table. 8. explains the simplification of logical statements with karnaugh maps. 9. identifies 10. explains half and full adders 11. explains half and full subtractors 12. identifies combinational circuit 13. explains the working principles of decoder, encoder, 14. recognize 7-segmented displays 15. explains the working principles of multiplexer and De multiplexer, 16. shows the applications of combinational circuits
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – number system and simplification of digital circuit design.</u> Introduction to digital quantities and System Numbers: Decimal , Binary , Binary arithmetic , Octal and Hexadecimal Numbers, Conversions of System Numbers, Arithmetic Operations with different number systems, and Signed Numbers. [24 hrs] Digital Codes: Binary coded decimal [BCD], Exc-3 code, Gray codes. [5 hrs] Simplification of digital circuit design: Boolean algebra, De 'Morgan theorems, Simplification Using Boolean Algebra, Standard Forms of Boolean Expressions (SOP and POS form), The karnaugh Map (Three, Four and Five- Variable Kamaugh Maps.[25 hrs] <u>Part B - Combinational Logic</u> Functions of Combinational Logic: Adders, Subtractors, Parallel Binary Adders, multiplier, and Magnitude comparators.[25 hrs]. Encoders, Decoders, Multiplexers, Demultiplexers, Parity Generators /Checkers, and code conversion circuits [25 hrs]. Flip-Flops: Latches, Edge-Triggered Flip-Flops and its applications. [5 hrs].

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.
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Student Workload (SWL)

اسبوعا 15 الحمل الدراسي للطلاب محسوب لـ

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3.8
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	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

Week	Material Covered
Week 1	Introduction to Digital Techniques and logic gates, General number formula : Binary, octal, decimal, hexadecimal numbers
Week 2	Conversions of System Numbers
Week 3	Arithmetic operations with different number systems, complements of number systems, binary codes, BCD codes, Ex-3 code , and gray code.
Week 4	Boolean algebra , De'Morgan theorems , Simplification Using Boolean Algebra,
Week 5	Standard Forms of Boolean Expressions (SOP and POS form)
Week 6	The Karnaugh Map (two, Three, Four and Five- Variable Karnaugh Maps)
Week 7	Introduction to Combinational Logic circuit and circuit analysis
Week 8	Adders, Subtractors, Parallel Binary Adders,
Week 9	Binary multiplier circuits and Magnitude comparators circuit.
Week 10	Flip-Flops:(Latches, Edge-Triggered Flip-Flops) and it's applications.
Week 11	Counter and Shift register
Week 12	Encoders, and Decoders circuits
Week 13	Multiplexers, and Demultiplexers circuits.



Week 14	Parity Generators/Checkers and design of code conversion circuits.
Week 15	Analogue to Digital convertor and Digital to Analogue convertor
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)
المناهج الاسبوعي للمختبر

Week	Material Covered
Week 1	Lab 1: Introduction to logic gates
Week 2	Lab 2: NOR Gate, NAND Gate, and XOR Gate application
Week 3	Lab 3: Comparator Circuit
Week 4	Lab 4: Half –Adder
Week 5	Lab 5: full –Adder Circuit
Week 6	Lab 6: Half Subtractor
Week 7	Lab 7: full Subtractor Circuit
Week 8	Lab 8: Even and odd Parity Generator and Checker Circuit
Week 9	Lab 9: Code converter Circuits
Week 10	Lab 10: Encoder Circuit
Week 11	Lab 11: Decoder Circuit
Week 12	Lab 12: Multiplexer Circuit
Week 13	Lab 13 : De - Multiplexer Circuit.
Week 14	Lab 14 : Flip- Flop application Circuits
Week 15	Lab 15 : Counter circuit
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Digital Fundamentals, Thomas .L. Floyd, Pearson international edition.	Yes
Recommended Texts	Digital Design, M. Morris. Mano, Pearson prentice Hall .	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

Engineering Drawing

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Drawing		Module Delivery
Module Type	Basic		☐ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☒ Practical ☐ Seminar
Module Code	COE 106		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGx11 UGI	Semester of Delivery	1
Administering Department	BSc – COMM	College	College of Engineering
Module Leader	م.م. بتول عبدالله	e-mail	E-mail:
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0
Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	9. Understanding the basis for any geometric shape or system, so teaching and training the student on engineering drawing will be able to perform engineering drawing or understand and read engineering drawings. 10. To have the knowledge of interpretation of dimensions of different quadrant projections. 11. To understand the basic principles of engineering drawing 12. To have the knowledge of generating the pictorial views
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	13. To understand the development of surfaces 14. To understand projections concept 15. To use the drawing tools professionally 16. To grew the ability of free hand sketching
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	14. Understanding the components of an engineering drawing and how to implement an engineering drawing 15. Learn engineering drawing and complete simple and complex engineering drawings 16. Prepare and understand drawings. 17. Identify various D curves used in Engineering Drawing and their applications. 18. Use the principles of orthographic projections. 19. By studying about projections of solids, students will be able to visualize three-dimensional objects and that will enable them to design new products. 20. Design and fabricate surfaces of different shapes. 21. Represent the objects in three-dimensional appearances.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Introduction</u> Introduction to Engineering Drawing and Drawing Instruments, Conventions, Viewing of engineering drawing sheets, Method of Folding of printed Drawing sheet , Drawing board, T-square, Drafter (Drafting M/c), Set squares, Protector, Drawing Instrument Box (Compass, Dividers, Scale, and Diagonal Scales etc.), pencils of different grades, Drawing pins/ Clips. [18 hrs] <u>Part B - Free hand drawing</u> Lines, polygons, ellipse etc., Geometrical figures and blocks with dimension, Transferring measurement from the given object to the free hand sketches., Solid objects, Cube, Cuboids, Cone, Prism, Pyramid, Frustum of Cone with dimensions, Free hand drawing of hand tools and measuring tools, simple fasteners (nuts, bolts, rivets etc.) trade related sketches. [16 hrs] <u>Part C - Method of presentation of Engineering Drawing</u> Pictorial View, Orthographic View [12 hrs]. Symbolic representation – different symbols used in the trades: Fastener (Rivets, Bolts and Nuts), Bars and profile sections, Weld, Brazed and soldered joints, Electrical and electronics element, Piping joints and fitting [18hrs.] <u>Part D - Projections</u> Concept of axes plane and quadrant, Orthographic projections, Method of first angle and third angle projections (definition and difference), Symbol of 1st angle and 3rd angle projection in 3rd angle [24 hrs] Orthographic projection from isometric projection, Reading of fabrication drawing Sign and Symbols of Electrical, Electronics and related trades, Sketch of Electrical and Electronics/ trade related components, Electrical and Electronics wiring diagram/ trade related Layout diagram, Electrical earthing diagram – Drawing the schematic diagram of plate and pipe earthing., Electrical, Electronics/ trade related circuit diagram, Block diagram of Instruments/ equipment of related trade [8 hrs]
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1. Behavior management Behavior management strategies foster an atmosphere of mutual respect, reduce disruptive behavior and ensure students have an equal opportunity to fulfill their potential in the classroom. It's crucial to provide them with both a positive and productive learning environment. Examples include establishing a reward system with an interactive chart where students move up or down depending on their performance and

behavior in class.

2. Blended learning
With a blended learning teaching strategy, technology is incorporated with traditional learning. This allows students to work at their own pace, research their ideas and become more physically engaged during lessons. Examples include providing interactive tablets or whiteboards with engaging activities and posting classwork online for easier access.

3. Cooperative learning
Group work is a cooperative learning strategy that allows students with various learning levels to work together. By encouraging them to express their own ideas and listen to others' ideas as a group, you help students develop communication and critical thinking skills. Examples include solving math puzzles together, performing skits as a team or working on group presentations.

4. Formative assessment
A formative assessment is used periodically to monitor student learning incrementally. This can more effectively measure the process of learning as opposed to end-of-unit tests and can help you to improve your teaching methods throughout the year. Examples of this teaching strategy include self-evaluation exercises and summarizing a topic in multiple ways.

5. Student-led teaching
The student-led teaching strategy lets students become the teacher. In a classroom with learners at different levels, you can better engage those learning faster by showing them how to teach and give feedback to their peers. They may team-teach or work in groups to teach a new topic. Examples include letting a student teach an entire lesson or having advanced writers lead a peer-editing session as well as provide constructive criticism.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

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

Module Evaluation

تقييم المادة الدراسية

As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #4 and #8, #11
	Assignments	2	10% (10)	3 and 13	LO #3, #4 and #10, #14
	Homework	8	20% (20)	Continuous	All
Summative assessment	Midterm Exam	2hr	10% (10)	12	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي العملي

Week	Material Covered
Week 1	Engineering Drawing – Introduction • Introduction to Engineering Drawing and Drawing Instruments • Conventions • Viewing of engineering drawing sheets • Method of Folding of printed Drawing sheet
Week 2	Drawing Instrument • Drawing board, T-square, Drafter (Drafting M/c), Set squares, Protector, Drawing Instrument Box (Compass, Dividers, Scale, and Diagonal Scales etc.), pencils of different grades, Drawing pins/ Clips.
Week 3	Free hand drawing • Lines, polygons, ellipse etc. • Geometrical figures and blocks with dimension. • Transferring measurement from the given object to the free hand sketches. • Solid objects – Cube, Cuboids, Cone, Prism, Pyramid, Frustum of Cone with dimensions. • Free hand drawing of hand tools and measuring tools, simple fasteners (nuts, bolts, rivets etc.) trade related sketches
Week 4	Lines • Definition, types and applications in drawing as per BIS: 46-2003 • Classification of lines (Hidden, center, construction, extension, Dimension, Section) • Drawing lines of given length (Straight, curved). • Drawing of parallel lines, perpendicular line • Methods of Division of line segment
Week 5	Drawing of Geometrical figures: • Definition, nomenclature and practice of – • Angle: Measurement and its types, method of bisecting. • Triangle: different types • Rectangle, Square, Rhombus, Parallelogram. • Circle and its elements • Different polygon and their values of included angles. Inscribed and circumscribed polygons
Week 6	Dimensioning , Lettering & Numbering • Single Stroke, Double Stroke, Inclined. • Definition, types and methods of dimensioning (functional, non-functional and auxiliary) • Position of dimensioning (Unidirectional, Aligned) • Types of arrowheads • Leader line with text • Symbols preceding the value of dimension and dimensional tolerance
Week 7	Sizes and layout of drawing sheets • Selection of sizes • Title Block, its position and content • Item Reference on Drawing Sheet (Item list)
Week 8	Method of presentation of Engineering Drawing • Pictorial View • Orthographic View • Isometric View
Week 9	Symbolic representation – different symbols used in the trades • Fastener (Rivets, Bolts and Nuts)



	- Bars and profile sections - Weld, Brazed and soldered joints - Electrical and electronics element - Piping joints and fitting
Week 10	Projections - Concept of axes plane and quadrant - Orthographic projections - Method of first angle and third angle projections (definition and difference) - Symbol of 1st angle and 3rd angle projection in 3rd angle
Week 11	- Orthographic projection from isometric projection - Reading of fabrication drawing
Week 12	Mid – term Exam
Week 13	- Sign and Symbols of Electrical, Electronics and related trades - Sketch of Electrical and Electronics/ trade related components - Electrical and Electronics wiring diagram/ trade related Layout diagram
Week 14	- Electrical earthing diagram – Drawing the schematic diagram of plate and pipe earthing. - Electrical, Electronics/ trade related circuit diagram - Block diagram of Instruments/ equipment of related trade
Week 15	Maps, and Charts, Reading Datasheets and Manuals
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- الرسم الهندسي, عبد الرسول الخفاف, 2003 - تمارين في الرسم الهندسي (متوفر في مكتبة كلية الهندسة) تأليف : سليمان توفيق احمد الناشر: دار الاعصار العلمي للنشر والتوزيع / الاردن	Yes
Recommended Texts	Colin H. Simmons, Dennis E. Maguire, Manual Of Engineering Drawing to British and International Standards, Elsevier Newnes, second edition, 2004, Typeset by Replika Press Pvt Ltd, India, Printed and bound in Great Britain	No
Websites	http://www.kutub.info/library	

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

Computer Skills

Module Information معلومات المادة الدراسية			
Module Title	Computer Skills		Module Delivery
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	U 103		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGI	Semester of Delivery	
Administering Department	All Departments	College	College of Engineering
Module Leader	م.م. محمد ناظم جواد		e-mail
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	12/6/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Training students on the basics of using the computer and providing them with the necessary skills to deal with the computer with high efficiency. 2. Assisting the student in distinguishing and developing his scientific and artistic abilities. 3. Enriching the student's skills to be able to deal with the computer with high efficiency. 4. Providing students with a way to use other modern technologies related to the educational process.
Module Learning Outcomes	1. Enabling the student to know the concepts of information technology by learning the basics of the computer. 2. Enabling the student to know about the use of GUI operating systems.

مخرجات التعلم للمادة الدراسية	3. Enabling the student to deal with the skills of using the operating system (Windows operating system) through exploring, customizing, and controlling its settings. 4. Enabling the student to work on the word processing program (Microsoft Word). 5. Enabling the student to work on the spreadsheet program (Microsoft Excel). 6. Enabling the student to work on the presentation program (Microsoft PowerPoint).
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (4 hrs) • Working with GUI operating systems with a focus on Microsoft Windows OS (8 hrs) • Microsoft Office Word (MS Word) (16 hrs) • Microsoft Office Excel (MS Excel) (16 hrs) • Microsoft Office PowerPoint (MS PowerPoint) (16 hrs)
Description	Overview of computers: basic components, applications. GUI operating systems: Microsoft Windows operating system. Microsoft Office Word: getting started with Word, editing a document and formatting text and paragraphs, adding tables and inserting graphic objects, controlling page appearance and proofing a document. Microsoft Office Excel: getting started with Excel, sorting, selecting and subtotaling data, formulas and functions, worksheet formatting and presentation. Microsoft Office PowerPoint: getting started with PowerPoint, developing a PowerPoint presentation, adding graphical elements to your presentation and modifying objects in your presentation, adding graphical elements, tables and charts to your presentation and modifying objects in your presentation, prepare to deliver your presentation.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	In this course, students are guided by: • Using different examples. • Using different styles of discussion that aim to connect the theoretical and practical sides. • Asking questions and giving exercises that require analysis and conclusions related to lectures. • Encourage students to participate in discussions and do the practical work. • Encourage students to work in groups.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	36	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.4
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation تقييم المادة الدراسية					
As		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	6 and 12	LO #1 to #3 and #4 to #6
	Assignments	2	10% (10)	2 and 13	LO #3 to #6
	Projects / Lab.	1	10% (10)	Continuous	All



	Report	1	10% (10)	13	LO #3, #4 and #6
Summative assessment	Midterm Exam	2hr	10% (10)	9	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

Week	Material Covered
Week 1	Overview of computers and their basic components and applications
Week 2	Operating computer using GUI operating systems
Week 3	The basic use of Microsoft Windows operating system
Week 4	Microsoft Office Word: Getting Started with Word
Week 5	Microsoft Office Word: Editing a Document and Formatting Text and Paragraphs
Week 6	Microsoft Office Word: Adding Tables and Inserting Graphic Objects
Week 7	Microsoft Office Word: Controlling Page Appearance and Proofing a Document
Week 8	Microsoft Office Excel: Getting Started with Excel
Week 9	Microsoft Office Excel: Sorting, Selecting and Subtotaling data
Week 10	Microsoft Office Excel: Formulas and Functions
Week 11	Microsoft Office Excel: Worksheet Formatting and Presentation
Week 12	Microsoft Office PowerPoint: Getting Started with PowerPoint
Week 13	Microsoft Office PowerPoint: Developing a PowerPoint Presentation, Adding Graphical Elements to Your Presentation and Modifying Objects in Your Presentation
Week 14	Microsoft Office PowerPoint: Adding Graphical Elements, tables and charts to Your Presentation and Modifying Objects in Your Presentation
Week 15	Microsoft Office PowerPoint: Prepare to deliver your presentation
Week 16	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي للمختبر

Week	Material Covered
Week 1	Introduction to the lab and get started with use of computer
Week 2	Basic use of Windows operating system
Week 3	General view of Windows OS tools with a focus on Microsoft Office tools
Week 4	Microsoft Office Word: Getting Started with Word
Week 5	Microsoft Office Word: Editing a Document and Formatting Text and Paragraphs
Week 6	Microsoft Office Word: Adding Tables and Inserting Graphic Objects
Week 7	Microsoft Office Word: Controlling Page Appearance and Proofing a Document
Week 8	Microsoft Office Excel: Getting Started with Excel
Week 9	Microsoft Office Excel: Sorting, Selecting and Subtotaling data
Week 10	Microsoft Office Excel: Formulas and Functions
Week 11	Microsoft Office Excel: Worksheet Formatting and Presentation
Week 12	Microsoft Office PowerPoint: Getting Started with PowerPoint
Week 13	Microsoft Office PowerPoint: Developing a PowerPoint Presentation, Adding Graphical Elements to Your Presentation and Modifying Objects in Your Presentation
Week 14	Microsoft Office PowerPoint: Adding Graphical Elements, tables and charts to Your Presentation and Modifying Objects in Your Presentation
Week 15	Microsoft Office PowerPoint: Prepare to deliver your presentation

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Joan Lambert and Steve Lambert, Windows 10 step by step, 1st Edition 2015. - Joan Lambert and Curtis Frye, Microsoft Office 2016 step by step, 1st Edition 2015.	Yes
Recommended Texts	- Michael Miller, ABSOLUTE BEGINNER'S GUIDE TO COMPUTER BASICS, 5th EDITION, QUE Indianapolis, Indiana 46240, 2010. - Paul McFedries, TEACH YOURSELF VISUALLY MICROSOFT WINDOWS 10, ANNIVERSARY	No
Websites	Microsoft Help, https://support.microsoft.com/en-us/products Learn Microsoft Office, https://www.goskills.com/Microsoft-Office	

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

English Language

Module Information

معلومات المادة الدراسية

Module Title	English Language	Module Delivery
Module Type	Basic	☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	U 104	
ECTS Credits	2	



SWL (hr/sem)	50		
Module Level	UGI	Semester (s) offered	1
Administering Department	BSc - COMM	College	College of Engineering
Module Leader	د. هناء محمد	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Review Committee Approval	13/6/2023	Version Number	1.0

Relation With Other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes, Indicative Contents and Brief Description

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر

Module Aims أهداف المادة الدراسية	The module aims to develop the students' English skills in reading, writing, listening and speaking.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	8. Read and understand simple texts in English. 9. Answer simple comprehension questions and match sentences about texts. 10. Reconstruct texts by reordering sentences. 11. Understand the main idea of a text. 12. Identify specific information in a text. 13. Writing and paraphrasing paragraphs.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. i) Grammar has a core place in language teaching and learning. ii) A wide variety of practice tasks in all the four skills are essential to language learning. iii) Everyday expressions, particularly of spoken English, also need a place in the syllabus. These can be functional, social, situational or idiomatic.
Course Description	Each unit is organized to enhance students' basic knowledge of vocabulary and grammar through reading texts. The students will learn how to form simple sentences and use them in real life situations as well as in writing different assignments. By the end of the course, students will be able to produce basic sentences and communicate in simple real-life situations.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Headway's trusted methodology combines solid grammar and practice, vocabulary development, and integrated skills with communicative role-plays and personalization. Authentic material from a variety of sources enables students to see new language in context, and a range of comprehension tasks, language and vocabulary exercises, and extension activities practice the four skills. 'Everyday English' and 'Spoken grammar' sections practice real-world speaking skills, and a writing section for each unit at the back of the book provides models for students to analyze and imitate.
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Student Workload (SWL)

الحمل الدراسي للطلاب

Structured SWL (h/sem)	33	Structured SWL (h/w)	2
الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعياً	
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1.1



الحمل الدراسي غير المنتظم للطلاب خلال الفصل	الحمل الدراسي غير المنتظم للطلاب أسبوعيا
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	50

Module Evaluation تقييم المادة الدراسية					
As		Time (hr)	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (5)	5, 10, 12, 15	All
	Assignments	6	20% (20)	2, 4, 6, 8, 10, 12	LO # 1, 3, 4, 5 and 6
	Seminars	2	5% (5)	Continuous	LO # 1-5
Summative assessment	Midterm Exam	2	20% (10)	7	LO # 1-3
	Final Exam	3	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المناهج الأسبوعي النظري	
Week	Material Covered
Week 1	GRAMMAR, READING , MAIN COURSE SPEAKING, LISTENING , VOCABULARY am/is/are my/your This is... Introduction dialogues, Everyday English dialogues Introductions, Good morning! Practicing introduction dialogues. People meet each other and introduce someone else. How are you? What's this in English? Numbers 1-10 and plurals.
Week 2	He/she/they His/her. Questions Where are they from?, Two people are on holiday in New York. Students ask and answer questions about where people are from. Countries, Numbers 10-20 A set of cities and countries: Brazil, Spain... Adjectives: awful, really good, fantastic, beautiful Nouns: centre, hospital, building, park
Week 3	Verb to be is recycled and extended to include negative and question forms. We're in Las Vegas! Roleplay: in a band. An interview with the band Metro 5. Jobs: a nurse, a doctor.. Personal information: surname, first name, address, married ... Social expressions: I'm sorry, thanks, please...
Week 4	Possessive adjectives. Possessive 's. Has/ have Adjective + noun Irregular Plurals Paddy McNab and his family, My best friend. The alphabet, On the phone, Saying email addresses. Who are they? Listen and identify the people. The family: mother, son.. Describing a friend: very beautiful, really funny...
Week 5	Present Simple: I/you/we/they a/an Adjective + noun Colin Brodie from Dundee. Role play: At a party. Where is Colin? Who is he with? At a party: Flavia and Terry are at a party in London. The lexical set of sports/food/drinks. Languages and nationalities.
Week 6	Present Simple: He/she Question and negatives Adverbs of frequency Prepositions of time Lois Maddox Talking about daily routines, Asking and answering questions about daily routines, Lifestyle questionnaire Listening a phone conversation between Lois and Elliot. Days of the week. The time. Words that go together: watch TV, get up early...
Week 7	Question words Subject pronouns Object pronouns Possessive pronouns This and that A postcard from San Francisco, A holiday postcard. Describing lifestyles, preferences and places, Roleplay: conversations in town. Listening the requests with Can I.....? Adjectives: lovely, terrible, comfortable, friendly... Opposite adjectives: new/old, big/small Places: chemist, post office
Week 8	There is /are Prepositions: in, on, under, next to Vancouver-the best city in the world, What to do and where to go. Talking and asking about rooms and furniture, Giving directions. My home town, Steve talks about living in Vancouver. Rooms and furniture: living room, bedroom ... In and out of town: beach, mountain, sailing,...
Week 9	Was/were born Past simple: irregular verbs It's a Jackson Pollock. Telling a story from pictures, Saying the dates in English. Magalie Dromand, Magalie dromand talks about her family. Saying years People

	and jobs Irregular verbs Have, do, go: have lunch, do homework, go shopping
Week 10	Past simple: regular and irregular Questions Negatives Ago Dialogues with simple past. Did you have a good weekend? Asking about holidays, A questionnaire, My last holiday, Roleplay: asking and giving directions. Angie and Rick are at work, Jack and Millie's holiday. Weekend activities: go to the cinema, have a meal... Time expressions: on Monday, last night... Sports and leisure: tennis, skiing, windsurfing... Play or go: play tennis, go skiing... Seasons: winter, summer...
Week 11	Can / can't, Adverbs, Adjective + noun Requests and offers The Internet, What can you do on the internet? Talking about what you can do, Talking about everyday problems, Five people talk about what they do on the internet. Verbs: draw, run, drive... Verb+noun: Listen to the radio, chat to friends Adjective+noun: fast car, busy city, dangerous sport Opposite adjectives: dangerous/ safe, old/modern, old/young.
Week 12	I'd like, You are what you eat, Discussion-what is a good diet? Conversation with Adam, Shopping: bread, milk, fruit, Please and thank you Some /any, Like and would like People from different parts of the world describe what they eat. Roleplay: Ordering a meal. Birthday wishes, What people want on their birthday. stamps, cheese, ham... Food: cereal, salad, pasta, fish... In a restaurant: menu, starter, desert, soup, salmon
Week 13	Present continuous, Present simple and present continuous. This week is different, Colin, a millionaire, gives money to homeless teenagers What's the matter? Why don't you? What is Nigel wearing? Nigel is on holiday, What's the matter. Colours: blue, red, green... Clothes: jacket, trousers, shoes and socks... Opposite verbs: buy/sell, love/hate, open/close...
Week 14	Future plans, Revision: question words, tenses. Seven countries in seven days, Life's big events: three people talk about their family, education, work and ambitions. A mini autobiography. Eddie is talking to a friend about his holiday plans, social expressions Transport: travel by bus, coach, motorbike, plane... Revision
Week 15	Irregular verbs, phonetic symbols, consonants and vowels.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	New Headway Beginner, by lizand john soars	Yes
Websites	https://www.learnenglish.de/ https://www.englishgrammar.org/ https://www.phrasebank.manchester.ac.uk/	

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required



Note:

NB 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

Mathematics II

Module Information معلومات المادة الدراسية					
Module Title	Mathematics II			Module Delivery	
Module Type	Basic			☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	E 102				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		UGI	Semester (s) offered		
Administering Department		All Departments	College	College of Engineering	
Module Leader	م.م. منتهى حسين		e-mail		
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor			e-mail		
Peer Reviewer Name			e-mail		
Review Committee Approval			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, Indicative Contents and Brief Description

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية مع وصف مختصر

Module Aims أهداف المادة الدراسية	This module aims to provide students with an understanding of, and competence in the use of, mathematical techniques that are relevant to the solution of engineering problems. It will also give students a firm foundation from which to develop solutions to a wider and deeper range of engineering problems that they will encounter throughout their undergraduate engineering program of study.
Module Learning Outcomes	14. Integration: Demonstrate an understanding of the fundamental concept of integration and antiderivative including types of integrations 15. Integration and transcendental functions: Extend the concept of integration to

مخرجات التعلم للمادة الدراسية	cover the integration of different types of transcendental functions 16. Numerical integration: Explain the fundamentals of numerical integration focusing on trapezoidal rule and Simpson's rule. 17. Methods of integration: Apply the techniques of integration to evaluate the integrals that cannot be solved directly. 18. Application of definite integrals: Extend the concept of integration to solve several problems involving area, volume, length of curve, surface area by revolution, center of mass and moment of inertia. 19. Area with polar coordinates: Demonstrate an understanding of polar coordinate system and its difference with Cartesian coordinate system, graphing and problems solution of such system. 20. Matrix: Explain the concept of matrix in mathematics, matrix algebra and solution of system of linear equations.
Indicative Contents المحتويات الإرشادية	The topics listed under the indicative content below are the underpinning areas of knowledge and understanding that will be obtained from successful completion of the module. The mathematical topics are illustrated in the context of relevant engineering scenarios. • Integration: Definition, antiderivative, definite and indefinite integral. • Integration and transcendental functions: integration of trigonometric and inverse trigonometric functions, integration of exponential and logarithmic functions, Integration of hyperbolic and inverse hyperbolic functions. • Numerical integration: Introduction, trapezoidal rule and Simpson's rule. • Methods of integration: Substitution method, integration by parts, Trigonometric substitution method, integration by partial fraction. • Application of definite integrals: Area, Volume, Lengths of curves in the plane, Areas of surfaces of revolution, Center of mass, moment of inertia. • Area of polar coordinates: Definition, polar equation, relating polar and Cartesian coordinates, Graph in polar coordinates, applications using polar coordinate system • Matrix: definition, matrix algebra, Determinant of matrix, Grammar's rule, Inverse of matrix, Gauss Elimination Method
Course Description	This course discuss the foundation for a robust understanding of mathematical concepts that underpin the various disciplines within engineering. It covers the integration and its types followed by methods of integration. The concept of numerical integration is also highlighted. Students will be able to utilize integration to solve several problems such as area between curves and volume by revolution. A focus is also given to the understanding of polar coordinate system and how to graph the curves and solve difficult integral in an easy way using such system. Matrix topic is also covered in this course so the students will be able to solve system of linear equations using matrix in different approaches. By the end of the course, students will have a sound understanding of these principles, preparing them for more advanced engineering courses in their respective fields
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Begin In Mathematics II, then employ a range of teaching strategies to ensure first-year engineering students fully grasp the various mathematical concepts. Instructional methods include interactive lectures, where core mathematical principles are explained in detail, and practical problem-solving sessions to provide hands-on learning experiences. Collaborative group work encourages peer-to-peer learning and reinforces understanding through shared insights. Regular formative assessments will be conducted to monitor students' understanding of the material, and feedback will be promptly given to guide their learning process. Instructors will maintain office hours for personalized support, and online resources will be available to supplement classroom instruction. Emphasis will be placed on relating mathematical concepts to real-world engineering applications to make



the learning experience more relevant and engaging. These strategies aim to develop students' critical thinking skills, enhance their problem-solving abilities, and prepare them for advanced engineering studies.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
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	20% (20)	3,5, 10, 12, 14	LO #1, 2, 3, 4, 5 and 7
	Assignments	6	10% (10)	4, 8, 12	LO # 1, 2, 3, 4, 5 and 6
	Home Work	6	10% (10)	2,5,7,9,11,13	LO # 1, 2, 3, 4, 5,6 and 7
Summative assessment	Midterm Exam	2 hr	10% (20)	7	LO # 1,4
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

Week	Material Covered
Week 1	Integration: Definition, antiderivative, definite and indefinite integral
Week 2	Integration and transcendental functions: (trigonometric and inverse trigonometric functions, exponential and logarithmic functions)
Week 3	Integration and transcendental functions: Integration and transcendental functions (hyperbolic and inverse hyperbolic functions)
Week 4	Numerical integration Introduction, trapezoidal rule and Simpson's rule
Week 5	Methods of integration Substitution method, integration by parts
Week 6	Methods of integration Trigonometric substitution method



Week 7	Methods of integration Integration by partial fraction method.
Week 8	Application of definite integrals Areas under the curve, area between curves,
Week 9	Application of definite integrals Volume by revolution
Week 10	Application of definite integrals Length of curve in the plane, Area of surface of revolution
Week 11	Application of definite integrals Center of mass, moment of inertia
Week 12	Application of definite integrals Area by polar coordinates
Week 13	Matrix Definition, matrix algebra
Week 14	Matrix Determinant of matrix, Grammar's rule
Week 15	Matrix Inverse of matrix, Gauss Elimination Method
Week 16	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	George B. Thomas and Ross L. Finney, "Calculus and Analytic Geometry, Addison- Wesley	Yes
Recommended Texts	Thomas Calculus, by George B. Thomas, Jr, Eleventh Edition Media Upgrade 2008 Calculus Early Transcendental (Sixth Edition) James Stewart	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	مقبول بقرار	(45-49)	More work required but credit awarded
	F - Fail	راسب	(0-44)	Considerable amount of work required

Note:



NB 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

Electrical Engineering Fundamentals II

Module Information معلومات المادة الدراسية			
Module Title	Electrical Engineering Fundamentals II		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 102		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	UGI	Semester of Delivery	
Administering Department	BSc - COMM	College	Type College Code
Module Leader	م.م. داخل اسماعيل	e-mail	E-mail:
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	12/06/2023	Version Number	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	17. This course deals with the basic concept of AC electrical circuits. 18. To understand ac voltage and current from a given circuit. 19. To understand Root Mean-Square (R.M.S.) & Average Value 20. To understand ac power Average power, Reactive power, Complex power. 21. To analysis the RL, RC, RLC circuit analysis 22. To perform mesh and Nodal analysis in AC circuit. 23. To develop problem solving skills and understanding of circuit theory through the application of techniques.
Module Learning Outcomes	22. Recognize advantages of use alternating current. 23. Recognize why using Sine Waveform 24. Define inductors and capacitors.



مخرجات التعلم للمادة الدراسية	25. How generation of alternating voltages and currents. 26. Recognize Phasor representation of AC quantities. 27. Define Ohm's Law in AC. Circuits. 28. Identify the basic circuit elements and their applications. 29. Explain the two Kirchoff's laws used in circuit analysis. 30. Discuss the Sinusoidal Steady-State Analysis.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A - A.C. Fundamentals Introduction, Sinusoids, Phasors, Phasor Relationships for Circuit Elements, Root Mean-Square (R.M.S.) & Average Values, Impedance and Admittance, [18 hrs] Part B - A.C Circuit Introduction, Capacitors, Series and Parallel Capacitors, Inductors, Series and Parallel Inductors, Series A.C. circuits, Parallel A.C. Circuits, Kirchhoff's Laws in the Frequency Domain, Impedance Combinations. [15 hrs] Part C - Sinusoidal Steady-State Analysis Nodal Analysis, Nodal Analysis with Voltage Sources, Mesh Analysis, Mesh Analysis with Current Sources, Superposition Theorem, Thevenin and Norton Equivalent Circuits [24 hrs] Part D - Frequency Response Series Resonance, Parallel Resonance, [6 hrs] Revision problem classes [6 hrs]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	1. Behavior management Behavior management strategies foster an atmosphere of mutual respect, reduce disruptive behavior and ensure students have an equal opportunity to fulfill their potential in the classroom. It's crucial to provide them with both a positive and productive learning environment. Examples include establishing a reward system with an interactive chart where students move up or down depending on their performance and behavior in class. 2. Blended learning With a blended learning teaching strategy, technology is incorporated with traditional learning. This allows students to work at their own pace, research their ideas and become more physically engaged during lessons. Examples include providing interactive tablets or whiteboards with engaging activities and posting classwork online for easier access. 3. Cooperative learning Group work is a cooperative learning strategy that allows students with various learning levels to work together. By encouraging them to express their own ideas and listen to others' ideas as a group, you help students develop communication and critical thinking skills. Examples include solving math puzzles together, performing skits as a team or working on group presentations. 4. Formative assessment A formative assessment is used periodically to monitor student learning incrementally. This can more effectively measure the process of learning as opposed to end-of-unit tests and can help you to improve your teaching methods throughout the year. Examples of this teaching strategy include self-evaluation exercises and summarizing a topic in multiple ways. 5. Student-led teaching The student-led teaching strategy lets students become the teacher. In a classroom with learners at different levels, you can better engage those learning faster by showing them
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how to teach and give feedback to their peers. They may team-teach or work in groups to teach a new topic. Examples include letting a student teach an entire lesson or having advanced writers lead a peer-editing session as well as provide constructive criticism.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	124	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	8
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	76	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.1
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	2	10% (10)	5 and 12	LO #1, #4 and #8, #11
	Assignments	2	10% (10)	3 and 13	LO #3, #4 and #10, #14
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	14	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	• Introduction: AC Circuits, A.C. Fundamentals, Types of waveforms
Week 2	• Definition of: Waveform, Instantaneous value, Cycle, Time period, Frequency, Amplitude, Peak-to-peak value, Phase, Phase angle, Phase difference, Angular Frequency
Week 3	• Root-Mean-Square (R.M.S.) & Average Values
Week 4	• Capacitors, Series and Parallel Capacitors • Inductors, Series and Parallel Inductors
Week 5	• A.C. Through Resistance, Inductance and Capacitances
Week 6	• Series A.C. circuits
Week 7	• Parallel A.C. circuits: Vector or Phasor Method, Admittance Method (Y), Complex or Phasor Algebra
Week 8	Mid-term Exam
Week 9	• Kirchhoff's Laws in the Frequency Domain • Impedance Combinations • Star-to-Delta transformations
Week 10	• Sinusoidal Steady-State Analysis: Nodal Analysis, Mesh Analysis
Week 11	• Sinusoidal Steady-State Analysis: Mesh Analysis
Week 12	• Circuit Theorems: Superposition, Source Transformation
Week 13	• Circuit Theorems: Thevenin and Norton Equivalent Circuits



Week 14	• Circuit Theorems: Thevenin and Norton Equivalent Circuits
Week 15	• Frequency Response: Series Resonance, Parallel Resonance
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

Week	Material Covered
Week 1	Lab 1: A.C. Measurement Instruments
Week 2	Lab 2: Introduction to Oscilloscope
Week 3	Lab 3: Inductors
Week 4	Lab 4: Capacitors
Week 5	Lab 5: Ohm's Law in A.C. Circuits
Week 6	Lab 6: Series and Parallel Combinations
Week 7	Lab 7: Star-Delta Transformations
Week 8	Lab 8: Kirchhoff's Laws in the Frequency Domain
Week 9	Lab 9: Superposition theorems
Week 10	Lab 10: Thevenin's theorems
Week 11	Lab 11: Norton's theorems
Week 12	Lab 12: Power in AC circuit
Week 13	Lab 13: Series Resonance
Week 14	Lab 14: Parallel Resonance
Week 15	Final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Theraja, B. L. A Textbook of Electrical Technology- Volume I (Basic Electrical Engineering). Vol. 1. S. Chand Publishing, 2005. - C.K. Alexander and M.N.O Sadiku, Fundamentals of Electric Circuits, McGraw-Hill Education, Fifth Edition, 2013	Yes
Recommended Texts	- Allan H. Robbins and Wilhelm C. Miller, Circuit analysis: Theory and practice, Cengage Learning, Fifth Edition, 2013. - Nilsson, James William, Electric circuits, Pearson Education India, 2008.	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

Electronic Physics

Module Information معلومات المادة الدراسية			
Module Title	Electronic Physics		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☐ Lab ☒ L Tutorial ☐ Practical ☐ Seminar
Module Code	COE104		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGI	Semester of Delivery	2
Administering Department	BSc - COMM	College	College of Engineering
Module Leader	أ.د. قيس شريف مجدي	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	15/06/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1-During the school year, the student learns an idea about the atomic structure, energy levels, and conductivity of minerals 2- The student will be introduced to semiconductors and diodes, their types and
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	applications in the field of communication science, and an understanding of electronic circuits and the most important electronic elements included in the designs of these circuits. 3- The study material aims to develop the student's mind and enable him to visualize the transmission of information and the foundations of establishing various electrical circuits. 4- Teaching this subject is the consolidation of the theoretical principles and foundations that depend on the creation of any electronic electrical circuit and its absolute understanding.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course is intended for teaching the basic principle of electronic physical for engineering students at the beginning graduate level. The course will have these important outcomes: (1) Understanding Energy Levels and Atomic Structure ; (2) Recognize how electricity works in electrical circuits. (3) List the various terms associated with electrical circuits. (4) Discuss the reaction and involvement of atoms in electric circuits. (5) Describe electrical conductivity, charge, and current. (6) Define Ohm's law. (7) Learn and understand the basics of transmitting electromagnetic signals through different mediums (8) Learn and understand the basics of creating electrical waves (9) Understanding the operating principle of Semiconductor , P-N Junction (10) the students will learn Rectifiers ,and its types (11) Explain the diode Circuit Applications and other Types of Semiconductor Diodes; such as zener diodes voltage regulators , clipping circuits , clamping circuits and wave form generation , (12) Understanding the waveform change of diode clipping and clamping circuits and Calculate and explain DC current-voltage behaviour of diodes and BJTs
Indicative Contents المحتويات الإرشادية	<u>Part A</u> - The atom models , wave nature of light , dual nature of matter, energy – band theory of metals , insulators and Semiconductors and explain the influence of excess minority carrier recombination of the performance of the devices.(7 hrs) <u>Part B</u>- p-n junction in equilibrium , current-voltage characteristics , charge control decryption of a diode transition and diffusion capacitance , diode switching Times, diode models, small-signal model and load line concept .(12 hrs) <u>Part c</u>-, the students will learn Rectifiers , zener diodes voltage regulators , clipping circuits , clamping circuits and wave form generation ,Varactor diode, tunnel diode, photodiode and photovoltaic (solar)cell, Light Emitting diode, principle and operation of semiconductor laser, metal Electronic Palasics semiconductor diode. On the last objective explain the waveform change of diode clipping and clamping circuits and the function of each one.(10 hrs)
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1-Encourage the student to think about ways of generating the electromagnetic wave 2- Encourage the student to think about the importance of the frequency and energy of the wave and the time periods. 3- 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. 4- Urge the student to think about the factors affecting wave transmission in the media. 5- Enable students to link theories to the practical reality of electrical circuits.

- 6- Enable students to pass professional exams organized by local or international bodies.
7- Enabling students to continue self-development after graduation.
8- Setting up special seminars for students for the purpose of self-development of their personalities.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
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	2	10% (10)	2 and 12	LO #1, #3, #5, #6,, 9, #10, #11,12
	Assignments	2	10% (10)	2 and 12	LO #9, #10 and #11, #12
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1, #9 and #10,11
Summative assessment	Midterm Exam	2hr	10% (10)	10	LO #1 - #10
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

Week	Material Covered
Week 1	The models of atoms :Explain the models of atoms and the mathematical equations of each model
Week 2	Dual nature of matter: Studying the dual nature of light and their mathematical relations, especially electromagnetic waves
Week 3	Energy-band theory of metals Insulators and Semiconductors: The theory of energy bands in conductors, insulators and semiconductors and the difference between them
Week 4	Internal structure of materials cell packing: Internal arrangement of various materials Metals, insulators and semiconductors
Week 5	Bragg's law and x-ray diffraction : The importance of Bragg's law in the study of x-ray diffraction
Week 6	electronic ballistics, Hall effect electronic ballistics, Hall effect: The effect of electric and magnetic fields on electron movement and the Hall effect
Week 7	Mobility and conduction ,energy distribution of electrons: Mobility, conductivity and energy distribution study of semiconductors
Week 8	Diffusion and drift motion and Carrier life time: Explanation of the phenomena of diffusion and drift
Week 9	semiconductors materials: Fermi-level in semiconductor: Semiconductor materials and Fermi level study of these materials and Study the types of semiconductors and the difference between them
Week 10	p-n junction in equilibrium, current-voltage characteristics: Studying the P-N junction and its voltage



	and current characteristics
Week 11	Small-signal model and load line concept: Studying the model of the minimum signal and the concept of the load line
Week 12	Rectifiers and the types of rectifiers : Study the rectifier and its types
Week 13	Types of Diodes: study the types of diodes used in electrical circuits, especially communication circuits, and the characteristics of each of them
Week 14	Clipping circuits and wave form generation: Study clipping circles and clamping circles, And configure the output waveform through circuit applications
Week 15	Transistor biasing PNP, NPN, FET: A study of the types of transistor bias PNP, NPN, FET
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Electrical and magnetic properties of materials Electrical and magnetic properties of materials	Yes
Recommended Texts	1. M.S. Tyagi, Introduction to Semiconductor Materials and Devices, Wiley & Sons 2. S.M. Sze, Semiconductor Devices, Wiley & Sons	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/physical electronics	

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

C++ Programming

Module Information معلومات المادة الدراسية			
Module Title	C++ Programming		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 105		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGI	Semester of Delivery	2
Administering Department	BSc - COMM	College	College of Engineering
Module Leader	م.م. عباس فاضل كاظم	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	13/06/2023	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Objectives أهداف المادة الدراسية	Upon completion of this course, the student will be able to: - Understand computers and classify programming languages . - Write simple C++ program. - Learn data types, variables, arithmetic operators, assignment and input statements. - Learn relational operators and logical expressions. - Using selection in program like if/if...else ,block statements , switch structures. - Develop executable programs by using repetition control structures: While Looping, Do...while Looping, For Looping, Break and continue Statements - Define and use functions in C++ program. - Learn Enumeration type with Functions - Learn how to define String type with string Operations - Learn define and use arrays and strings - Define pointer data types , Address of Operator (&) ,Pointer Variables - Perform simple file I/O streams.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	- Recognize computer system and programming languages . - Build simple program by using different data types. - Define the relational operators and logical expressions. - Adding new abilities to program by using selection control structures.		

	11. Applying repetition control structures in programs. 12. Perform , Break and continue Statements. 13. Recognize functions in C++ program and their types and how to use them in program 14. Define the Enumeration type with Functions 15. Identify String type with string Operations 16. Using arrays with their types in programs and strings with functions. 17. Applying pointer data types and classes. 18. Apply recursion in functions 19. Perform simple file I/O streams
Indicative Contents المحتويات الإرشادية	Introduction to computers and Classification of programming languages (1 hours), Introduction to problem solving (3 hours), Computers and Programming Languages (3 hours), Processing a C++ Program (3 hours). Basics of a C++ Program, Data Types, Variables, Arithmetic Operators (3 hours) , Assignment and Input Statements (3 hours). Input / Output, I/O Streams (3 hours), Predefined Functions, Output Formatting (3 hours), Control Structures I (Selection): Relational Operators, Logical Expressions (3 hours), If/If...else, Block Statements (3 hours), Switch Structures (3 hours), Control Structures I (Repetition) : While Looping, Do...while Looping (3 hours), For Looping (3 hours), Break and continue Statements (3 hours), Preparatory week before the final Exam User-Defined Functions (6 hours), User-defined simple data types and the string type (6 hours), Arrays and strings (6 hours), Pointers, Classes (3 hours), File Input/Output (3 hours).
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, homework's and examples. Practical examples help students to understand the course material.

Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.1
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	2	10% (10)	8 and 13	LO #1 to #4 and #6 to #8
	Assignments	3	10% (10)	4, 7 and 11	LO #2, #3, #4, #5 and #7, #8, #9
	Projects / Lab.	1	20% (20)	Continuous	All
	Report	0			



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

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

Week	Material Covered
Week 1	History of C++ Language - Typical C++ Development Environment
Week 2	The main structure of C++ programs- OOP Classes declaration
Week 3	Data types - Variable declaration - Constant declaration - Simple Input/Output, I/O Streams
Week 4	Arithmetic Operators - Relational Operators - Logical Operators - Assignment Operators
Week 5	Increment & Decrement Operators -Bitwise Operators - Misc Operators.
Week 6	Conditional (Selection) Statement: if statement - if...else statements
Week 7	Nested if statements - Switch statement
Week 8	Iteration (Repetition) statements: while statement - do/while statement
Week 9	for statement - Nested for statement- Break and continue Statements
Week 10	Mid-term Exam
Week 11	Array: Array declaration - Single dimensional array - Multiple –subscripted Arrays
Week 12	String (1D array of characters) - Array of strings (2D array of characters).
Week 13	Functions: Function Prototypes (declaration) - Calling Function - Function Definition
Week 14	Passing Arguments functions.
Week 15	Pointers: Advantage of using pointers - pointers in array.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي للمختبر

Week	Material Covered
Week 1	Review of typical C++ Environment and program instillation package
Week 2	Understand structure of C++ programs- OOP Classes declaration
Week 3	executing examples of Data types - Variable declaration - Constant declaration - Simple Input/Output, I/O Streams
Week 4	Applying of Arithmetic Operators - Relational Operators - Logical Operators - Assignment Operators
Week 5	Applying of Increment & Decrement Operators -Bitwise Operators - Misc Operators.
Week 6	Using Conditional (Selection) Statement: if statement - if...else statements
Week 7	Utilizing Nested if statements - Switch statement
Week 8	Appling Iteration (Repetition) statements: while statement - do/while statement
Week 9	Using for statement - Nested for statement- Break and continue Statements
Week 10	Applying Array: Array declaration - Single dimensional array
Week 11	Executing of Multiple –subscripted Arrays
Week 12	Test String - Array of strings.
Week 13	Understanding Functions: Function Prototypes (declaration) - Calling Function - Function Definition
Week 14	Applying Passing Arguments functions.
Week 15	Understanding Pointers: Advantage of using pointers - pointers in array.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	1. C++ Programming: From Problem Analysis to Program Design, 6th Edition; D.S. Malik	Yes



Recommended Texts	- Programming and problem solving with C++: comprehensive sixth edition, Nell Dale and Chip Weems. - Computer Science Textbook class XI, First Edition, 2019. - C++ Primer Plus, Sixth Edition	No
Websites	http://www.cplusplus.com/doc/tutorial/	

Grading Scheme				
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

WORKSHOPS SKILLS

Module Information				
معلومات المادة الدراسية				
Module Title	WORKSHOPS SKILLS		Module Delivery	
Module Type	BASIC		☐Theory ☐Lecture ☐Lab ☐Tutorial ☒Practical ☐Seminar	
Module Code	COE 107			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level		UGx11 UGI	Semester of Delivery	
Administering Department		BSc - COMM	College	Collage of Engineering
Module Leader	م.م. داخل اسماعيل		e-mail	
Module Leader’s Acad. Title			Module Leader’s Qualification	
Module Tutor			e-mail	E-mail
Peer Reviewer Name			e-mail	E-mail
Scientific Committee Approval		13/06/2023	Version Number	1.0

Date			
Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Objectives أهداف المادة الدراسية	أ- الأهداف المعرفية 1- أفهام وتعليم الطالب مفاهيم ومبادئ مادة الورش الهندسية العامة . 2- تمكين الطلبة من الحصول على المعرفة والفهم الكامل لكافة مهارات الورش الهندسية . 3- افهام الطالب وتعريفه بكافة المهارات نظريا وعمليا وتعريفه بكافة أجزاء الماكينة التي يتم تطبيق المهارة بالإضافة الى التطبيق العملي على الماكينة لكل طالب ولكافة المهارات. 4- تمكين الطلبة من الحصول على المعرفة والفهم لكل أجزاء الماكينة وفائدة كل جزء . 5- تمكين الطلبة من الحصول على المعرفة والفهم على تشخيص انواع الاعمال التي تنجزها كل ماكينة وطريقة العمل عليها . ب – الأهداف المهاراتية الخاصة بالبرنامج 1 - شرح المهارات بالتفصيل وتطبيقها على الماكينة عمليا والتأكيد على الطلبة بضرورة الالتزام بقواعد السلامة المهنية. 2 - تزودهم بمعلومات وطرق حل المشاكل العملية المتعلقة بجميع المهارات. 3 - يتم عرض مواضيع كافة المهارات نظريا. 4 - يتم التركيز على العملي في المهارات وضرورة مشاركة الطالب في العملي.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	مخرجات التعلم للمادة الدراسية 1- بناء الطالب علميا وعمليا وتأهيله للعمل في مجال تقنيات الهندسة. 2- بناء وإعداد الطالب نفسيا ليقوم بدوره كمهندس يعتمد عليه في هذا المجال. 3- بناء طلبة قادرين على التنافس مع مهندسين اخرين لفرص العمل و الحصول على المقاعد المطلوبة في اكمال دراسات عليا. 4- قابلية التقديم لاختبارات خارجية من قبل هيئات محلية أو أقليمية أو عالمية لغرض اكمال الدراسة او التعيين. 5- حث الطالب على الإبداع والتفكير في مشاريع التخصص ومواكبة التطور الحاصل في هذا المجال. 6- تزويد الطلبة بمهارات علمية وعملية ومهارات ذاتية تمكنه من حل المشاكل العملية والتعامل معها بمفاهيم علمية.		
Indicative Contents المحتويات الإرشادية	المحتويات الإرشادية اولا:- السلامة المهنية. يتم تعريف الطالب بقواعد وإجراءات السلامة المهنية لجميع المهارات وجميع الأقسام لاجل سلامة المستخدم من مخاطر التعامل مع هذه الأدوات والمكانن (3 ساعات). ثانيا:- مهارة القياسات. شرح نظري لمهارة القياسات وتعريف الطالب بجميع العدد والأدوات المستخدمة في عملية القياس بالتفصيل ومن ثم يتم التطبيق العملي لمهارة القياسات حيث يقوم كل طالب بإجراء عملية القياس لمختلف الأدوات إضافة الى تسليم ومناقشة التقارير الخاصة بالمهارة (6ساعات) ثالثا:- مهارة اللحام . شرح نظري لمهارة اللحام وتعريف الطالب بجميع العدد والأدوات المستخدمة في عملية اللحام وشرح طرق اللحام بالتفصيل إضافة الى التطبيق العملي حيث يقوم كل طالب بعملية اللحام وذلك لاكتساب الخبرة العملية إضافة الى تسليم ومناقشة التقارير الخاصة بالمهارة (6ساعات). رابعا:- مهارة البرادة . شرح نظري لمهارة البرادة وتعريف الطالب بجميع العدد والأدوات المستخدمة في عملية البرادة وشرح طرق البرادة بالتفصيل إضافة الى التطبيق العملي حيث يقوم كل طالب بعملية البرادة يدويا وذلك لاكتساب الخبرة العملية إضافة الى تسليم ومناقشة التقارير الخاصة بالمهارة (6ساعات).		

خامسا:- مهارة السبكة . شرح نظري لمهارة السبكة وتعريف الطالب بجميع العدد والأدوات المستخدمة في عملية السبكة وشرح طرق السبكة بالتفصيل إضافة الى التطبيق العملي حيث يقوم كل طالب بعملية السبكة يدويا وذلك لاكتساب الخبرة العملية إضافة الى تسليم ومناقشة التقارير الخاصة بالمهارة (6ساعات) سادسا:- مهارة التفريز . شرح نظري لمهارة التفريز وتعريف الطالب بجميع أجزاء ماكينة التفريز إضافة الى العدد والأدوات المستخدمة في عملية التفريز وشرح طرق التفريز بالتفصيل إضافة الى التطبيق العملي حيث يقوم كل طالب بالعمل على ماكينة التفريز وتنفيذ التمارين المختلفة على الماكينة وذلك من اجل اكتساب الخبرة العملية إضافة الى تسليم ومناقشة التقارير الخاصة بالمهارة (6ساعات). سابعا:- مهارة التجليخ . شرح نظري لمهارة التجليخ وتعريف الطالب بجميع أجزاء ماكينة التجليخ إضافة الى العدد والأدوات المستخدمة في عملية التجليخ وشرح طرق التفريز بالتفصيل إضافة الى التطبيق العملي حيث يقوم كل طالب بالعمل على ماكينة التفريز وتنفيذ التمارين المختلفة على الماكينة وذلك من اجل اكتساب الخبرة العملية إضافة الى تسليم ومناقشة التقارير الخاصة بالمهارة (6ساعات). ثامنا:- مهارة الخراطة . شرح نظري لمهارة الخراطة وتعريف الطالب بجميع أجزاء ماكينة الخراطة إضافة الى العدد والأدوات المستخدمة في عملية الخراطة وشرح طرق الخراطة بالتفصيل إضافة الى التطبيق العملي حيث يقوم كل طالب بالعمل على ماكينة الخراطة وتنفيذ التمارين المختلفة على الماكينة وذلك من اجل اكتساب الخبرة العملية إضافة الى تسليم ومناقشة التقارير الخاصة بالمهارة (6ساعات). تاسعا:- مهارة التأسيسات الكهربائية . شرح نظري لمهارة التأسيسات الكهربائية وتعريف الطالب بجميع العدد والأدوات المستخدمة في عمليات التأسيسات الكهربائية وشرح طرق التأسيسات الكهربائي إضافة الى التطبيق العملي حيث يقوم كل طالب بالعمل على ربط الدوائر الكهربائية المختلفة وذلك من اجل اكتساب الخبرة العملية إضافة الى تسليم ومناقشة التقارير الخاصة بالمهارة (6ساعات).
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	امتحانات يومية باسئلة عملية وعلمية .* درجات مشاركة لاسئلة المنافسة الصعبة بين الطلاب .* وضع درجات للواجبات البيتية والتقارير المكلفة بهم .* *امتحانات فصلية للمنهج الدراسي اضافة الى امتحان نصف السنة والامتحان النهائي.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

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	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري والعملي

Week	Material Covered
Week 1	شرح نظري وعملي لمبادئ السلامة المهنية وبيان خطورة عدم الالتزام بها على حياة الطالب.
Week 2	شرح نظري لمهارة القياسات وتعريف جميع العدد والأدوات المستخدمة في القياس.
Week 3	تطبيق عملي لمهارة القياسات.
Week 4	شرح نظري لمهارة اللحام وتعريف جميع العدد والأدوات المستخدمة في عملية اللحام.
Week 5	تطبيق عملي لمهارة اللحام.
Week 6	شرح نظري لمهارة البرادة وتعريف جميع العدد والأدوات المستخدمة في عملية البرادة.
Week 7	تطبيق عملي لمهارة البرادة.
Week 8	شرح نظري لمهارة السباكة وتعريف جميع أجزاء فرن السباكة.
Week 9	تطبيق عملي لمهارة السباكة.
Week 10	شرح نظري لمهارة التفريز وتعريف الطالب بجميع أجزاء ماكينة التفريز.
Week 11	تطبيق عملي لمهارة التفريز.
Week 12	شرح نظري لمهارة التجليخ وتعريف الطالب بجميع أجزاء ماكينة التجليخ.
Week 13	تطبيق عملي لمهارة التجليخ.
Week 14	شرح نظري لمهارة التأسيسات الكهربائية مع التطبيق العملي.
Week 15	شرح نظري لمهارة الخراطة وتعريف الطالب بجميع أجزاء ماكينة الخراطة.
Week 16	تطبيق عملي لمهارة الخراطة.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	MECH6014 - Mechanical Workshop Practice Tarafdar, J.C. and Raliya, R., "The Nanotechnology", Published by Scientific Publisher (SP), India, (2012).	Yes
Recommended Texts	MECH6028 - Mechanical Workshop Practice 2 - CIT Modules	No
Websites	https://www.coursera.org/browse/workshop-and-engineering/workshop -	

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
حقوق الانسان والديمقراطية

Module Information معلومات المادة الدراسية						
Module Title	حقوق الانسان والديمقراطية			Module Delivery		
Module Type	B			☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	U101					
ECTS Credits	2					
SWL (hr/sem)	30					
Module Level	UGx11 UGI		Semester of Delivery			2
Administering Department		All Departments		College	College of Engineering	
Module Leader		م.م. ايات عبدالحكيم		e-mail		
Module Leader's Acad. Title				Module Leader's Qualification		
Module Tutor				e-mail		
Peer Reviewer Name				e-mail		
Scientific Committee Approval Date		12/06/2023		Version Number		

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1- يتعلم الطالب خلال السنة الدراسية أساسيات حقوق الانسان والديمقراطية ما حقوقه كيف يدافع عنها بالطرق القانونية وماهي ضماناتها الداخلية والدولية. 2-استحصال المعرفة في مجال الديمقراطية وأنواع أنظمتها واثرها على حقوق الانسان . 3-تنمية شخصية الطالب وتعزيز وعيهم في الأنظمة السياسية الديمقراطية وتفصيلها وكيفية تطبيقها على ارض الواقع واهمية ان يكون فعال في المجتمع من خلال احترامه لحقوق الآخرين ومعرفة ان الحقوق والحريات تنتهي

	عند بداية حقوقهم وحرياتهم ويؤدي واجباته بدلا من اكتساب الحقوق فقط. 4- تعزيز ثقافة السلام القائمة على العدل والمساواة.			
Module Learning Outcomes	1 -تمكين الطالب من معرفة اساسيات الدفاع عن حقوقه وحقوق الآخرين بعد معرفتها ومعرفة أهميتها له وللمجتمع بصورة عامة وأيضا معرفه كل شخص حدود حقوقه وحرية . ٢- تمكين الطالب في المشاركة السياسية وذلك من خلال معرفته بأهمية مشاركته في الانتخابات وتأثير هذه المشاركة على سير الانتخابات وتشكيل السلطة فيما بعد. ٣- معرفه الطالب ضمانات حقوقه وحرياته وماهي مصادر ها. ٤ – معرفة الفرق بين الحقوق والحريات. ٥- تمكين الطالب من معرفة ماهي المفهوم العلمي للديمقراطية وماهي جذورها وانواعها واشكالها. ٦- يتعلم الطالب كيف يؤثر النظام الديمقراطي على حقوق الانسان وماهي العلاقة بينها. ٧ – ادراك الطالب ضرورة ان يكون مواطن فعال في المجتمع ايضاً معرفه شروط الناخب وشروط المرشح للانتخابات. ٨- معرفه أنظمة الانتخابات وايهما افضل. ٩ – فهم الطالب للقانون الدولي لحقوق الانسان وايضاً معرفة مختصرة عن المنظمات الدولية والية عملها كالأمم المتحدة ومنظمة الصليب الأحمر وغير ها.			
	مخرجات التعلم للمادة الدراسية			
Indicative Contents	1 الجزء الأول -تعريف حقوق الانسان وحقوق الانسان في الحضارات القديمة. (تعريف الحق وتعريف الانسان ومعرفة أهمية حقوق الانسان بالنسبة للإنسان والمجتمع أيضا دراسة حقوق الانسان في الحضارات كالحضارة المصرية والعراقية واليونانية والرومانية)(٤ساعات) الجزء الثاني معرف حقوق الانسان في الأديان السماوية واهمها الإسلام (٢ساعة) مصادر حقوق الانسان تتضمن (مصادر دولية كالإعلان العالمي لحقوق الانسان والعهدان الدوليان والمصادر الإقليمية التي تشمل الاتفاقيات الإقليمية كالاتفاقية الاوربية والأمريكية والدستور)(٢ساعة) ضمانات حقوق الانسان (كالضمانات الدستورية والقانونية)(٢ساعة) الاتفاقيات الدولية والإقليمية لحقوق الانسان (٢ساعة) الحريات العامة وانواعها والمقارنة فيما بينها (٢ساعة) مستقبل حقوق الانسان والعولمة وحقوق الانسان (٢ساعة) تعريف وتاريخ وأنواع الديمقراطية (دراسة تعريف ونشأة وتطور الديمقراطية مبادئها وانواعها كالديمقراطية المباشرة وغير المباشرة والنظام الرئاسي والبرلماني)(٦ساعات) تعريف الانتخاب وشروطه وأنواع النظم الانتخابية وتعريف المجلس النيابي (٦ساعات) العلاقة بين الديمقراطية وحقوق الانسان (٢ساعة)			
	المحتويات الإرشادية			
Learning and Teaching Strategies				
استراتيجيات التعلم والتعليم				
Strategies	1-زيادة وعي الطالب بأهمية معرفه حقوقه وواجباته اتجاه المجتمع وعلاقة حقوق الانسان بالنظام الديمقراطي 2-ثقافة عامة في مجموعة من المجالات ومنها المجال القانوني و السياسي والاجتماعي ورفع ثقة الطالب بنفسه من خلال ربط المادة النظرية بالواقع العملي			
Student Workload (SWL)				
الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا				
Structured SWL (h/sem)	33	Structured SWL (h/w)	2	
الحمل الدراسي المنتظم للطلاب خلال الفصل		الحمل الدراسي المنتظم للطلاب أسبوعيا		
Unstructured SWL (h/sem)	17	Unstructured SWL (h/w)	1.1	
الحمل الدراسي غير المنتظم للطلاب خلال الفصل		الحمل الدراسي غير المنتظم للطلاب أسبوعيا		
Total SWL (h/sem)	50			
الحمل الدراسي الكلي للطلاب خلال الفصل				
Module Evaluation				
تقييم المادة الدراسية				
As	Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome



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

Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

Week	Material Covered
Week 1	محاضرة تعريفية عن المادة وأهميتها ..
Week 2	تعريف الحق والانسان وحقوق الانسان وأهمية حقوق الانسان ,حقوق الانسان في الدين الإسلامي والحضارات القديمة.
Week 3	مصادر حقوق الانسان الدولية والإقليمية والمحلية.
Week 4	ضمانات حقوق الانسان الدستورية والقانونية وضمانات حقوق الانسان على الصعيد الدولي.
Week 5	ضمانات حقوق الانسان في الإسلام
Week 6	دور المنظمات الإقليمية في حماية حقوق الانسان.
Week 7	خصائص حقوق الانسان وتعريف الحريات العامة وأنواعه والمقارنة بينها وبين الحقوق القانون الدولي لحقوق الانسان والقانون الدولي الإنساني ومنظمة الصليب الأحمر.
Week 8	مستقبل حقوق الانسان وسبل تطويرها .
Week 9	العولمة وحقوق الانسان .
Week 10	تعريف الديمقراطية وتطورها التاريخي ومبادئها . الديمقراطية بين العالمية والخصوصية . اشكال الديمقراطية / الديمقراطية المباشرة.
Week 11	الديمقراطية شبه المباشرة والديمقراطية التمثيلية / اركان النظام التمثيلي / اشكال النظام التمثيلي.
Week 12	المجلس النيابي وأنواعه / الانتخاب وشروطه / هيئة الناخبين.
Week 13	تنظيم عملية الانتخاب / تحديد الدوائر الانتخابية / القوائم الانتخابية / المرشون/ الحملة الانتخابية / التصويت .
Week 14	نظم الانتخابات.
Week 15	علاقة الديمقراطية بحقوق الانسان وكيفية التأثير والتأثر فيما بينها.
Week 16	الامتحان النهائي

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	تأليف ماهر صالح علاوي ورياض عزيز /حقوق الانسان والطفل والديمقراطية هادي وعلي عبد الرزاق محمد واخرون / العاتك / بيروت / ٢٠٠٩	نعم
Recommended Texts	عباس الدليمي / حقوق الانسان الفكر والممارسة فخري رشيد ،صلاح ياسين /المنظمات الدولية / العاتك لصناعة الكتاب / بغداد عصام العطية / القانون الدولي العام / المكتبة القانونية /بغداد/2012	لا
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group	A - Excellent	امتياز	90 - 100	Outstanding Performance



(50 - 100)	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.



المرحلة الثانية

2

الملحق : وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Signals and Systems		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 201		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGII	Semester of Delivery	
Administering Department	BSc - COMM	College	College of Engineering
Module Leader	م.د. عبدالوهاب عيسى	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	2024/9/1	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 Objectives أهداف المادة الدراسية	1. Understanding the connectivity between mathematical operations and real-life operations. 2. Understanding the basics of signals in real-life. 3. Understanding the basics of signals in real life. 4. To grow problematic resolution skills through utilization of signals and systems basic mathematical skills. 5. To understand the power and energy of signals. 6. To represent signals using different domains (Time/Frequency). 7. Understanding the system's behavior through different excitations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the main signal components. 2. Show how to recognize the different signal types. 3. Show how to distinguish between the different system types. 4. List the basic signal functions. 5. Understanding Signals operations. 6. Show the interaction between signals and systems. 7. Understanding the convolution and correlation operations. 8. Understanding the reaction between signals themselves. 9. Understanding the representation of the signals and systems in time/frequency-domains.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Definitions (2 hrs). • Signals Classification (8 hrs). • Systems Classifications (6 hrs). • Operations on Signals (8 hrs). • Convolution and Correlation (4 hrs). • Fourier Series (7 hrs). • Fourier Transform (10 hrs).
Description	Introduction and Definitions. Classification of signals: Continuous time (CT), discrete time (DT), periodic/aperiodic, random signals, Energy/Power Signals. Basics Signal Types: step, Ramp, Pulse, Impulse, and Exponential. Main Operations on Signals: amplitude/time/frequency scale, time shift, phase shift, time reversal, and signals multiplication. Classification of systems: CT and DT systems, basic properties of systems-Linear time invariant/variant system and properties, memory/memoryless, causal/not-causal, bounded/unbounded, and stable/unstable systems. Analysis of Continuous Time Signals: Fourier series analysis, spectrum of CT signals, Fourier Transform and its Inverse. Fourier Transform properties. Sampling theory: Sampling of CT signals and aliasing, signal reconstruction from sampled signals.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم



Strategies	The primary approach for administering this module is expected to motivate students to participate in the exercises while simultaneously improving and developing their capacity for critical thought. This will be accomplished via lessons, collaborative tutorials, and the consideration of straightforward trials including selecting tasks that are appealing to students.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المناهج الأسبوعي النظري

	Material Covered
Week 1	Introduction and Definitions.
Week 2	Classification of signals: Continuous time (CT), discrete time (DT).



Week 3	Classification of Signals: Periodic/aperiodic, random signals.
Week 4	Classification of Signals: Energy/Power Signals.
Week 5	Basics Signal Types: step, Ramp, Pulse, Impulse, and Exponential.
Week 6	Main Operations on Signals: amplitude/time/frequency scale, phase shift, time reversal, and signals multiplication.
Week 7	Sampling Theory: Sampling of CT signals and aliasing, signal reconstruction from sampled signals.
Week 8	Sampling Theory: Reconstruction of signals from sampled signals.
Week 9	Classification of systems: CT and DT systems, basic properties of systems-Linear time invariant/variant system and properties.
Week 10	Classification of Systems: Memory/memoryless, causal/not-causal, bounded/unbounded, and stable/unstable systems.
Week 11	Analysis of Continuous Time Signals: Trigonometric Fourier series.
Week 12	Analysis of Continuous Time Signals: Exponential Fourier series, spectrum of CT signals.
Week 13	Analysis of Continuous Time Signals: Foreword Fourier Transform.
Week 14	Analysis of Continuous Time Signals: Inverse Fourier Transform.
Week 15	Analysis of Continuous Time Signals: Fourier Transform properties.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introducing laboratory apparatus and their basic operation.
Week 2	Variant Signals generation using function generator.
Week 3	Signals operations using RLC circuits – Part 1 (Summation).
Week 4	Signals operations using RLC circuits – Part 2 (Phase shift).
Week 5	Signals operations using RLC circuits – Part 3 (Integration).
Week 6	Signals operations using RLC circuits – Part 4 (Differentiation).
Week 7	Sampling of Signals – Part 1 (Based on Signal Generators).
Week 8	Sampling of Signals – Part 2 (Based on Transistor).
Week 9	Signals Reconstruction from Sampled Version – Part 1 (Using passive filter).
Week 10	Signals Reconstruction from Sampled Version – Part 2 (Using active filter).
Week 11	Fourier Series Verification – Part 1 (Based on Signal Generator and passive filter).
Week 12	Fourier Series Verification – Part 2 (Based on Signal Generator and active filter).
Week 13	Fourier Series Verification – Part 3 (Based on 555 timer and passive filter).
Week 14	Fourier Series Verification – Part 4 (Based on 555 timer and active filter – first week)
Week 15	Fourier Series Verification – Part 4 (Based on 555 timer and active filter – second week)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• B.P. Lathi and R.A. Green, Linear systems and	Yes



	signals, Third Edition, Oxford University Press, 2018, ISBN: 9780190200176. • Alan V. Oppenheim, Ronald W. Schafer, Discrete-Time Signal Processing, Third Edition, Pearson, 2010, ISBN: 9780131988422.		
Recommended Texts	Luis F. Chaparro, Signals and Systems Using MATLAB, Second Edition, Elsevier, 2015, ISBN: 9780123948120	No	
Websites	N/A		

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.

الملحق : وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Applied Mathematics I		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 202		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGII	Semester of Delivery	1
Administering Department	BSc - COMM	College	College of Engineering
Module Leader	د. حامد هاشم الزويني	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	2024/9/1	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 Objectives أهداف المادة الدراسية	- Help students appreciate the use of mathematics as a form of communication; - Help students acquire a range of mathematical techniques and skills and to foster and maintain the awareness of the importance of accuracy; - Make Mathematics relevant to the interests and experiences of students by helping them to recognize Applied Mathematics in their environment; - Help students to develop positive attitudes, such as open-mindedness, self-reliance, persistence and a spirit of enquiry; - Prepare students for the use of Mathematics in further studies; - Help students to develop an appreciation of the wide application of Mathematics and its influence in the development and advancement of civilization; - Help students become increasingly aware of the unifying structure of Mathematics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of this course, a student will be able to: - Enabling student to know the coordinate systems and its types and properties. - Enabling student to know how to perform basic vector operations such as addition, scalar multiplication, dot and cross product of vectors, and understand subspaces and basis in the vector space R_n, orthogonal complement and projection. - Enabling student to know the concepts of partial derivative and how can deal with the high order of derivatives. - Enabling student to know the introduction of differential equations - Enabling student to know how to use Laplace transform to convert the domain from time to S-domain. - Enabling student to know how to use Z transform to convert the domain from time to Z-domain in the signal processing
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: - Coordinate systems (9 hrs) - Vector geometry (9 hrs) - Partial derivatives (6 hrs) - Laplace transform and its inverse (6 hrs) - Z-transform and its inverse (6 hrs)
Description	Coordinates systems: Cartesian Coordinates, Cylindrical coordinates, Polar Coordinates; Graphing in Polar Coordinates; Polar Equations of Lines, Circles, and Cardioids. Conic Sections and Quadratic Equations: circles, parabola, ellipse, and hyperbola. Three-Dimensional Coordinate Systems. Vectors and the Geometry of Space: addition, subtraction, and scalar multiplication; Dot Product: orthogonal vectors,

and vector projection; Properties of product. Cross Product: area of parallelogram, test of parallelism, triple product; Equations of Lines and Planes in Space; Distance between a Point and a Line; Distance between a point and a Plane; Angle between Planes and Lines of Intersection of Planes; Product of three or more vectors. Partial derivatives: Function of two or more variables, The Chain Rule, Directional derivative, Gradient, divergence and Curl, Tangent plane and normal line and Maxima, minima & saddle point. Laplace transform and inverse Laplace transform: definitions, properties and applications, Z-Transform and inverse Z-transform: Introduction, Properties of Z-Transform, Z- transform of elementary functions, Linearity properties, Some standard in Z-Transform, Inverse Z-Transform, Method for finding Inverse Z-Transform, Application of Z-Transform to difference equations

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

- The module will be delivered using a combination of lectures, tutorials, and directed and independent learning.
- The learning and teaching approach will include the introduction of theoretical basis in the lecture form and the application aspects will be further studied throughout the tutorial sessions, including problem solving. In direct learning, you will be instructed to prepare for the lectures including reading the notes, finding and analyzing relevant information in advance.
- Working group (2-3 students per group) will be formed to encourage you to engage critical discussion in class.
- Case studies will be used to demonstrate and reinforce the lectures and labs.
- Solving examples, problems will give experience to understand the complex cases in communication field.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.8
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	2	5% (10)	6 and 12	LO #1 to #3 and #4 to #6
	Assignments	2	5% (10)	2 and 13	LO #3 to #6
	Projects / Lab.				
	Homework	2	10% (20)	13	LO #3, #4 and #6
Summative assessment	Midterm Exam	1hr	10% (10)	10	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Coordinates systems: Cartesian Coordinates, Cylindrical coordinates, Polar Coordinates; Graphing in Polar Coordinates; Polar Equations of Lines, Circles, and Cardioids. Conic Sections and Quadratic Equations: circles, parabola, ellipse, and hyperbola. Three-Dimensional Coordinate Systems.
Week 2	
Week 3	Vectors and the Geometry of Space: addition, subtraction, and scalar multiplication; Dot Product: orthogonal vectors, and vector projection; Properties of product. Cross Product: area of parallelogram, test of parallelism, triple product; Equations of Lines and Planes in Space; Distance between a Point and a Line; Distance between a point and a Plane; Angle between Planes and Lines of Intersection of Planes; Product of three or more vectors.
Week 4	
Week 5	
Week 6	Partial derivatives: Function of two or more variables, The Chain Rule, Directional derivative, Gradient, divergence and Curl, Tangent plane and normal line and Maxima, minima & saddle point.
Week 7	
Week 8	Laplace transform and inverse Laplace transform: definitions, properties and applications
Week 9	
Week 10	
Week 11	Mid Exam
Week 12	Z-Transform and inverse Z-transform: Introduction, Properties of Z-Transform, Z- transform of elementary functions, Linearity properties, Some standard in Z-Transform, Inverse Z-Transform, Method for finding Inverse Z-Transform, Application of Z-Transform to difference equations
Week 13	
Week 14	
Week 15	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	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Text Book □ Peter V. O'Neil, "Advanced Engineering Mathematics", Cengage Learning, 2012	Yes
Recommended Texts	Supplementary Books - W.E. Boyce, "Elementary differential equations and boundary value problems", Wiley, 2010. - Erwin Kreyszig, "Advanced Engineering Mathematics," 10th edition, Wiley, 2011. - D.G. Zill, "Advanced Engineering Mathematics," 5th ed., Jones & Bartlett Learning, 2014. - Gilbert Strang, "Differential Equations and Linear Algebra," Wellesley-Cambridge Press	Yes
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.

الملحق : وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Applied Mathematic II		Module Delivery
Module Type	Core		☒ Theory
Module Code	COE 208		☐ Lecture
ECTS Credits	4		☐ Lab
SWL (hr/sem)	100		☒ Tutorial
			☐ Practical
			☐ Seminar
Module Level	UGII	Semester of Delivery	2
Administering Department	BSc - COMM	College	College of Engineering
Module Leader	د. حامد هاشم الزويني	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	



Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	2024/9/1	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	COE 202: Applied Mathematics I	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	15. Help students appreciate the use of mathematics as a form of communication; 16. Help students acquire a range of mathematical techniques and skills and to foster and maintain the awareness of the importance of accuracy; 17. Make Mathematics relevant to the interests and experiences of students by helping them to recognize Applied Mathematics in their environment; 18. Help students to develop positive attitudes, such as open-mindedness, self-reliance, persistence and a spirit of enquiry; 19. Prepare students for the use of Mathematics in further studies; 20. Help students to develop an appreciation of the wide application of Mathematics and its influence in the development and advancement of civilization; 21. Help students become increasingly aware of the unifying structure of Mathematics.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon successful completion of this course, a student will be able to: 1. Solve linear, exact and homogeneous first-order ODEs and their initial value problems and, homogeneous or non-homogeneous second-order ODEs and their initial value problems with appropriate methods. 2. Perform basic vector operations such as addition, scalar multiplication, dot and cross product of vectors, and understand subspaces and basis in the vector space R_n , orthogonal complement and projection. 3. Perform basic matrix operations, elementary row operations and row reduced echelon form, bases for row, column or null spaces, and solve homogeneous and nonhomogeneous systems.



	4. Calculate sequences and series if the signals mathematically 5. Using of Laplace transform to convert the domain from time to S-domain. 6. Using of Z transform to convert the domain from time to Z-domain in the signal processing
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: 1. Fourier series and Fourier transform (9 hrs) 2. Sequence and series (9 hrs) 3. Multiple integrals (12 hrs) 4. Ordinary DE (6 hrs) 5. Partial DE (6 hrs)
Description	Fourier series, Fourier transform and invers Fourier transform: definitions, properties and applications. Multiple Integrals: Area by Double Integration. Double Integrals in Polar Form. Double and Triple Integrals in Rectangular Coordinates, Cylindrical and Spherical Coordinates. Sequences and Series: Sequence: convergence, tests and properties, types of sequences. Series: geometric series, nth partial sum. Test of convergence, alternating series and Taylor's series, Power series. Ordinary Differential Equations: First order (variables separable, homogeneous), First order (linear – Bernoulli and exact), Second order (Homogeneous and non-homogeneous) and Higher order differential equations. Partial Differential Equations: formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order Lagrange's linear equation and non-linear equations, Charpit's method, Method of separation of variables for second order equations.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	• The module will be delivered using a combination of lectures, tutorials, and directed and independent learning. • The learning and teaching approach will include the introduction of theoretical basis in the lecture form and the application aspects will be further studied throughout the tutorial sessions, including problem solving. In direct learning, you will be instructed to prepare for the lectures including reading the notes, finding and analyzing relevant information in advance. • Working group (2-3 students per group) will be formed to encourage you to engage critical discussion in class. • Case studies will be used to demonstrate and reinforce the lectures and labs. • Solving examples, problems will give experience to understand the complex cases in communication field.
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Student Workload (SWL)



الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

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	52	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

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	6 and 12	LO #1 to #3 and #4 to #6
	Assignments	2	10% (10)	2 and 13	LO #3 to #6
	Projects / Lab.				
	Report	2	10% (20)	13	LO #3, #4 and #6
Summative assessment	Midterm Exam	1hr	10% (10)	9	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Fourier series, Fourier transform and invers Fourier transform: definitions, properties and applications.
Week 2	
Week 3	Multiple Integrals: Area by Double Integration. Double Integrals in Polar Form. Double and Triple Integrals in Rectangular Coordinates, Cylindrical and Spherical Coordinates.
Week 4	
Week 5	
Week 6	Sequences and Series: Sequence: convergence, tests and properties, types of sequences. Series: geometric series, nth partial sum. Test of convergence, alternating series and Taylor's series, Power series.
Week 7	
Week 8	



Week 9	Mid exam
Week 10	Ordinary Differential Equations: First order (variables separable, homogeneous), First order (linear – Bernoulli and exact), Second order (Homogeneous and non-homogeneous) and Higher order differential equations.
Week 11	
Week 12	
Week 13	Partial Differential Equations: formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order Lagrange's linear equation and non-linear equations, Charpit's method, Method of separation of variables for second order equations.
Week 14	
Week 15	
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	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Text Book ☐ Peter V. O'Neil, "Advanced Engineering Mathematics", Cengage Learning, 2012	Yes
Recommended Texts	Supplementary Books ☐ W.E. Boyce, "Elementary differential equations and	No



	boundary value problems”, Wiley, 2010. - Erwin Kreyszig, “Advanced Engineering Mathematics,” 10th edition, Wiley, 2011. - D.G. Zill, “Advanced Engineering Mathematics,” 5th ed., Jones & Bartlett Learning, 2014. - Gilbert Strang, “Differential Equations and Linear Algebra,” Wellesley-Cambridge Press	
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.

الملحق : وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Electrical Circuits	Module Delivery
Module Type	Core	☒ Theory



Module Code	COE 203		☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		UGII	Semester of Delivery		1
Administering Department		BSc - COMM	College	College of Engineering	
Module Leader	م.م. ضحى كريم خلف		e-mail		
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor			e-mail	E-mail	
Peer Reviewer Name			e-mail	E-mail	
Scientific Committee Approval Date		2024/9/1	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 Objectives أهداف المادة الدراسية	22. This course deals with the basic information about the Transient Circuit: RC, RL, RLC circuit and parallel and their complete response in time and S- Domain. 23. Providing students with a way to understand Poly Phase Circuits: Single- phase three wire systems, circle diagram 3- phase balance an Unbalance system star and delta connections Power in 3- phase circuit. 24. Assisting the student to understand the basic of Coupling: Magnetic coupling coefficient of coupling, equivalent circuits, linear and ideal transformers. 25. Providing students with a way to understand information about the Two-Port Network: One- port network, Y-Z-G-H and parameters, image and iterative Operations, Attenuation and phase functions, and insertion loss of Networks. 26. Providing students with a way to understand Filters: Constant K- filers, low pass, high pass, and all pass filters, Active filters.
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	27. To develop problem solving skills and understanding of electrical circuit theory through the application of techniques modern. 28. Assisting the student in distinguishing and developing his scientific and artistic abilities. 29. Enriching the student's skills to be able to deal with electrical circuit with high efficiency. 30. Providing students with a way to use other modern technologies related to the educational process.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	10. Enabling the student to know the concepts of the Transient Circuit: RC, RL, RLC circuit series and parallel their complete response in time and S- Domain and Locus diagram. 11. Enabling the student to know about the use of Poly Phase Circuits: Single- phase three wire systems, Circle diagram of 3- phase balance an Unbalance system star and delta connections Power in 3- phase circuit 12. Enabling the student to deal with the skills of using the magnetic coupling coefficient of coupling, equivalent circuits, transformer: linear and ideal transformers. 13. Enabling the student to know the Two-Port Network: One- port network, Y-Z-G-H and parameters, image and iterative Operations, Attenuation and phase functions, and insertion loss of Networks. 14. Enabling the student to know the concepts of the Filters: Constant K- filers, low pass, high pass, and all pass filters, Network transformations, Active filters.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Methods of Analysis First order circuit and second order circuit</u> • Introduction, Transient Circuit RC, RL, RLC circuit and parallel and series and their complete response in time and S- Domain and Locus diagram (24 hrs) <u>Part B - Methods of Analysis and Applications</u> • Poly Phase Circuits: Single- phase three wire systems, circle diagram 3- phase balance an Unbalance system star and delta connections Power in 3- phase circuit. (24 hrs) • Coupling: Magnetic coupling coefficient of coupling, equivalent circuits, linear and ideal transformers. (16 hrs) • Two-Port Network: One- port network, Y-Z-G-H and parameters, Attenuation and phase functions, and insertion loss of Networks. (16 hrs) • Filters: Constant K- filers, low pass, high pass, and all pass filters, Active filters. (16 hrs)
Description	Overview of electrical circuits: basic of Analysis First order circuit and second order circuit, Transient Circuit RC, RL, RLC circuit and parallel and series and their complete



response in time and S- Domain. Enabling the student to know the methods of analysis and applications Poly Phase Circuits: Single- phase three wire systems, circle diagram 3- phase balance an Unbalance system star and delta connections Power in 3- phase circuit, Two-Port Network: One- port network, Y-Z-G-H and parameters, Attenuation and phase functions, and insertion loss of Networks and Filters: Constant K- filers, low pass, high pass, and all pass filters, Active filters.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

In this course, students are guided by:

- Using different examples.
- Using different styles of discussion that aim to connect the theoretical and practical sides.
- Asking questions and giving exercises that require analysis and conclusions related to lectures.
- Encourage students to participate in discussions and do the practical work.
- Encourage students to work in groups.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	108	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	42	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Num ber	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	6 and 12	LO #1 to #3 and #4 to #6
	Assignments	2	5% (10)	2 and 13	LO #3 to #6
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #3, #4 and #6



Summative assessment	Midterm Exam	1hr	10% (10)	9	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Overview of electrical circuits and their basic components and applications
Week 2,3,4,5	Analysis First & second order circuits Transient Circuit RC, RL, RLC circuit
	The source-free RC circuit and Singularity Functions.
	Step Response of an RC Circuit, Step Response of an RL Circuit
	RLC circuit, Tow mesh circuit and Tutorial
Week 6	S-Domain circuit, Locus Diagrams.
Week 7	Poly phase Circuit: 3- phase balance system star and delta connections Power in 3- phase circuit.
Week 8	Poly phase Circuit: 3- phase Unbalance system star and delta connections Power in 3- phase circuit.
Week 9	Magnetically couple circuit: Magnetic coupling coefficient of coupling.
Week 10	Magnetically couple circuit: Energy in a Coupled Circuit
Week 11	Magnetically couple circuit: Ideal Transformers and Linear Transformers.
Week 12	Two-Port Network: Introduction, one-Port Network
Week 13	Two-Port Network: Y-Z-G-H and parameters, Attenuation and phase functions, and insertion loss of Networks.
Week 14	Filters: Constant K– filters, passive filters (low pass, High pass, Band pass Band stop)
Week 15	Filters: Active filters (low pass, High pass, Band pass Band stop)
Week 16	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to the lab and get started with use of components circuits
Week 2	Basic use of Electrical circuits
Week 3	Transient Circuits: RC- Circuit series and parallel (source free, step response)
Week 4	Transient Circuits: RL- Circuit series and parallel (source free, step response)
Week 5	Transient Circuits: RLC- Circuit series (source free, step response)



Week 6	Transient Circuits: RLC- Circuit parallel (source free, step response)
Week 7	Poly phase Circuit: 3- phase balance system star and delta connections
Week 8	Poly phase Circuit: 3- phase un balance system star and delta connections
Week 9	Magnetically couple circuit: Magnetic coupling coefficient of coupling, Energy in a Coupled Circuit
Week 10	Magnetically couple circuit: Ideal Transformers and Linear Transformers.
Week 11	Two-Port Network: : Y-Z parameters
Week 12	Two-Port Network: : G-H parameters
Week 13	Filters: passive filters (low pass, High pass, band pass, band stop)
Week 14	Filters: active filters (low pass, High pass)
Week 15	Filters: active filters (band pass, band stop)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Fundamentals Of Electric Circuits, 3rd edition, [Charles K.Alexander] [Matthew N. O. Sadiku], 2006. - SCHAUM'S OUTLINE of Electric Circuits, 5th edition.	Yes
Recommended Texts	- Allan H. Robbins and Wilhelm C. Miller, Circuit analysis: Theory and practice, Cengage Learning, Fifth Edition, 2013. - Nilsson, James William, Electric circuits, Pearson Education India, 2008.	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.

الملحق : وصف المادة الدراسية



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Electronic I		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 204		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGII	Semester of Delivery	1
Administering Department	BSc - COMM	College	College of Engineering
Module Leader	م.م. علاء ابراهيم حسين	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	2024/9/1	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 Objectives	31. The student learns about the basic construction and operation of a bipolar
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أهداف المادة الدراسية	transistor. And be able to apply appropriate biasing to secure operation in the active area. 32. Identify and be able to explain the characteristics of an NPN or PNP transistor, and the student learns about the important parameters that determine the response of the transistor. 33. Being able to test the transistor and identify its three terminals. 34. The student will then be able to determine DC current levels for a variety of important BJT configurations. 35. Understand how to measure the important voltage levels of a BJT transistor configuration and use them to determine if the network is working properly. 36. The student will also be familiar with the saturation and cut-off conditions of the BJT network and the expected voltage and current levels determined by each condition. 37. Be able to perform load line analysis for the most common BJT configurations. 38. Learn about the design process of BJT loudspeakers. 39. Understand the basic operation of transistor switching networks. 40. Begin to understand the troubleshooting process as applied to BJT configurations. 41. Develop a sense of the stability factors of BJT formation and how they affect its operation as a result of changes in specific properties and environmental changes.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	15. Enabling student to know the concepts of bipolar transistor, NPN or PNP transistor by learning the basics of the transistor. 16. Enabling student to know about the BJT transistor configurations. 17. Enabling student to design process of BJT loudspeakers. 18. Understand the basic operation of transistor switching networks 19. Enabling student to test the transistor and identify its three terminals.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (4 hrs)



	• Working with Power point (8 hrs) • Theoretical lectures (32hrs) • Lap (16 hrs)
Description	Transistor Concept, Transistor construction, Transistor operation, common-base configuration, common-emitter configuration, and common-collector configuration. Bipolar Junction Transistors: Introduction, Transistor Construction, Transistor Operation, Common-Base Configuration, Common-Emitter Configuration, Common-Collector Configuration, Limits of Operation. DC Biasing—BJTs: Introduction, Operating Point, Fixed-Bias Configuration, Emitter-Bias Configuration, Voltage-Divider Bias Configuration, Collector Feedback Configuration, Emitter-Follower Configuration, Common-Base Configuration, Miscellaneous Bias Configurations, Design Operations, Multiple BJT Networks, Transistor Switching Networks, Troubleshooting Techniques, Bias Stabilization. BJT AC Analysis: Amplification in the AC Domain, BJT Transistor Modeling, The r_e Transistor Model, Common-Emitter Fixed-Bias Configuration, Voltage-Divider Bias, CE Emitter-Bias Configuration, Emitter-Follower Configuration, Common-Base Configuration, Collector Feedback Configuration, Collector DC Feedback Configuration, Two-Port Systems Approach, The Hybrid Equivalent Model, Approximate Hybrid Equivalent Circuit, Complete Hybrid Equivalent Model. Field-Effect Transistors, Introduction, Construction and Characteristics of JFETs, Transfer Characteristics.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	In this course, students are guided by: • Using different examples. • Using different styles of discussion that aim to connect the theoretical and practical sides. • Asking questions and giving exercises that require analysis and conclusions related to lectures. • Encourage students to participate in discussions and do the practical work.
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- Encourage students to work in groups.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	57	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview and history of semiconductor Diodes and Diode Applications.
Week 2	Transistor Concept , Transistor construction, Transistor operation, common-base configuration, common-emitter configuration, and common-collector configuration.
Week 3	Bipolar Junction Transistors: Introduction, Transistor Construction, Transistor Operation, Common-Base Configuration, Common-Emitter Configuration, Common-Collector Configuration, Limits of Operation.



Week 4	DC Biasing—BJTs: Introduction, Operating Point, Fixed-Bias Configuration,
Week 5	DC Biasing—BJTs: Emitter-Bias Configuration, Voltage-Divider Bias Configuration, Collector Feedback Configuration, Emitter-Follower Configuration,
Week 6	DC Biasing—BJTs: Common-Base Configuration, Miscellaneous Bias Configurations, Design Operations, Multiple BJT Networks,
Week 7	DC Biasing—BJTs: Transistor Switching Networks, Troubleshooting Techniques, Bias Stabilization.
Week 8	BJT AC Analysis: Amplification in the AC Domain, BJT Transistor Modeling,
Week 9	The r_e Transistor Model, Common-Emitter Fixed-Bias Configuration, Voltage-Divider Bias, CE Emitter-Bias Configuration,
Week 10	Emitter-Follower Configuration, Common-Base Configuration, Collector Feedback Configuration, Collector DC Feedback Configuration,
Week 11	Two-Port Systems Approach, The Hybrid Equivalent Model,
Week 12	Approximate Hybrid Equivalent Circuit, Complete Hybrid Equivalent Model.
Week 13	Field-Effect Transistors, Introduction, Construction.
Week 14	Characteristics of JFETs , Transfer Characteristics.
Week 15	PowerPoint: Prepare to deliver your presentation
Week 16	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to the lab and get started with use of tools which uses in the experiments.
Week 2	Introduction to the devices uses in the lab and and how to use it.
Week 3	An overview of the experiments that will be carried out in the laboratory and using some of the available programs.
Week 4	Diode Characteristics: Implementation this experiment in the laboratory.
Week 5	Clipping and Clamping: Implementation these experiments in the laboratory.
Week 6	Rectifiers: Implementation this experiment in the laboratory
Week 7	Transistor Characteristics: Implementation this experiment in the laboratory.
Week 8	Transistor Characteristics: Implementation this experiment in the laboratory
Week 9	Transistor CE Characteristics: Implementation this experiment in the laboratory
Week 10	Transistor CE Characteristics: Implementation this experiment in the laboratory
Week 11	Transistor CB Characteristics: Implementation this experiment in the laboratory



Week 12	Transistor CB Characteristics: Implementation this experiment in the laboratory
Week 13	Transistor CC Characteristics: Implementation this experiment in the laboratory
Week 14	Review and discussion
Week 15	Preparatory week before the final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Electronic Devices and Circuit Theory Robert L. Boylestad Louis Nashelsky/ Eleventh Edition . - Electron Flow Version Ninth Edition, Thomas L. Floyd	Yes
Recommended Texts	Fundamentals of Microelectronics Second Edition Behzad Razavi, University of California, Los Angeles	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.

الملحق : وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Electronic II		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 209		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	2
Administering Department	BSc - COMM	College	College of Engineering
Module Leader	م.م. علاء ابراهيم حسين	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	2024/9/1	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Electronic I , 2 nd Stage	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	42. The student learns about the basic construction and operation of a multistage amplifiers. 43. Identify and be able to explain the characteristics and types of multistage amplifiers (cascade....etc.). 44. Being able to identify Tuned amplifiers. 45. The student will then be able to learn about Transformer- coupled amplifiers for a variety of configurations. 46. Understand the Description and operation of four-layer devices. 47. The student will also be familiar with the Oscillators kinds and applications. 48. Learn about the Large-Signal Amplifier classifications and applications. 49. Understand the basic operation of Integrated Circuit power amplifier. 50. Begin to understand the electronic communication principals, types, modulation and multiplexing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	20. Enabling student to know the concepts of multistage amplifiers. 21. Enabling student to know about the types of multistage amplifiers. 22. Enabling student to understand the design concepts of Large-Signal Amplifier. 23. Understand the basic operation of OP-AMP amplifiers. 24. Enabling student to understand the fundamentals of electronic communication and Communication Systems.
Indicative Contents	Indicative content includes the following.



المحتويات الإرشادية	• Course introduction (4 hrs) • Working with Power point (8 hrs) • Theoretical lectures (32hrs) • Lap (16 hrs)
Description	Multistage amplifier: Analysis of multistage amplifiers (voltage gain, current gain, etc.), and types of multistage amplifiers (cascade....etc.). Tuned amplifiers: Transformer- coupled amplifiers; signal- tuned, and tapped and double tuned amplifiers. Introduction to four-layer devices: Description and operation of silicon control rectifier, disc, thyrister, GTO, and triac. Feedback Amplifier, Op-Amp and Application. Oscillators: Positive feedback and oscillation, Stability of Oscillation, Sinusoidal oscillator, Phase-shift Oscillator, Wien Bridge Oscillator, LC- Oscillator, Crystal Oscillator. Large-Signal Amplifier: Amplifier classification, Class A, Class B, Class AB, Class C, Power field-effect Transistor, Integrated Circuit power amplifier, Push-pull. OP-AMP amplifiers, Integration using OP-AMP, differentiation using OP-AMP. Oscillators using OP-AMP, 555 timer and applications. voltage control oscillator using 555 timer. Introduction to electronic communication: Communication Systems, Types of Electronic Communication, modulation and multiplexing, the electromagnetic spectrum, Bandwidth. Concept of gain and attenuation, Reactive components, Tuned circuits and Resonance, filters circuits, Fourier theory.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	In this course, students are guided by: • Using different examples. • Using different styles of discussion that aim to connect the theoretical and practical sides. • Asking questions and giving exercises that require analysis and conclusions related to lectures. • Encourage students to participate in discussions and do the practical work. • Encourage students to work in groups.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	32	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview and history of Electronics types and Applications.
Week 2	Multistage amplifier: Analysis of multistage amplifiers (voltage gain, current gain, etc.)
Week 3	Types of multistage amplifiers (cascade....etc.)
Week 4	Tuned amplifiers: Transformer- coupled amplifiers; signal- tuned, and tapped and double tuned amplifier



Week 5	Introduction to four-layer devices: Description and operation of silicon control rectifier, disc, thyrister, GTO, and triac
Week 6	Feedback Amplifier, Op-Amp and Application
Week 7	Oscillators: Positive feedback and oscillation, Stability of Oscillation Sinusoidal oscillator
Week 8	Phase-shift Oscillator, Wien Bridge Oscillator, LC-Oscillator, Crystal Oscillator
Week 9	Large-Signal Amplifier: Amplifier classification, Class A, Class B, Class AB, Class C, Power field-effect Transistor
Week 10	Integrated Circuit power amplifier, Push-pull. OP-AMP amplifiers, Integration using OP-AMP, differentiation using OP-AMP.
Week 11	Oscillators using OP-AMP, 555 timer and applications. voltage control oscillator using 555 timer.
Week 12	Introduction to electronic communication: Communication Systems, Types of Electronic Communication, Modulation and multiplexing, the electromagnetic spectrum, Bandwidth. Concept of gain and attenuation, Reactive components, Tuned circuits and Resonance, filters circuits, Fourier theory
Week 13	Amplitude Modulator and Demodulator Circuits: Basic principles of amplitude modulation, Amplitude Modulators, Amplitude Demodulators, Balanced Modulators, SSB Circuits. Angle modulation Circuits: Frequency Modulators, Phase Modulators, Frequency Demodulators.
Week 14	Digital Modulation Circuits: BPSK Modulator, Coherent Detector for BPSK, QPSK Transmitter and Coherent Receiver, Non coherent BASK Receiver. DPSK Transmitter and Receiver.
Week 15	PowerPoint: Prepare to deliver your presentation
Week 16	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to the lab and get started with use of tools which uses in the experiments.
Week 2	Introduction to the devices uses in the lab and how to use it.
Week 3	An overview of the experiments that will be carried out in the laboratory and using some of the available programs.



Week 4	Oscillators: Implementation this experiment in the laboratory
Week 5	Amplifiers: Implementation this experiment in the laboratory
Week 6	OP-AMP applications: Implementation this experiment in the laboratory
Week 7	555-timer applications: Implementation this experiment in the laboratory
Week 8	Voltage control oscillator: Implementation this experiment in the laboratory
Week 9	Gain analysis: Implementation this experiment in the laboratory
Week 10	Linear and angle modulations' different types of modulation and demodulation circuits: Implementation this experiment in the laboratory
Week 11	Linear and angle modulations' different types of modulation and demodulation circuits: Implementation this experiment in the laboratory
Week 12	Digital modulation and demodulation circuits: Implementation this experiment in the laboratory
Week 13	Digital modulation and demodulation circuits: Implementation this experiment in the laboratory
Week 14	Review and discussion
Week 15	Preparatory week before the final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Electronic Devices and Circuit Theory Robert L. Boylestad Louis Nashelsky/ Eleventh Edition . - Electron Flow Version Ninth Edition Thomas L. Floyd	Yes
Recommended Texts	Fundamentals of Microelectronics Second Edition Behzad Razavi, University of California, Los Angeles	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.

الملحق : وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية		
Module Title	Electromagnetic Fields I	Module Delivery
Module Type	Core	☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical
Module Code	COE 206	
ECTS Credits	4	
SWL (hr/sem)	100	



		☐ Seminar	
Module Level	UGII	Semester of Delivery	1
Administering Department	BSc - COMM	College	College of Engineering
Module Leader	م.م. محمد ناظم جواد	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	2024/9/1	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 Objectives أهداف المادة الدراسية	Study of electromagnetic fields is basically concerned with study of charges at rest and in motion. Electromagnetic principles serve as fundamentals for detailed and in-depth study of communication engineering and are indispensable for analysis and understanding of various subjects in communication engineering like antennas, waves propagation, microwaves, radar and so on.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	25. Enabling student to know how to treat with mathematical equations of vector for different types of coordinates. 26. Enabling student to know how to plot the components for different coordinates. 27. Apply vector calculus to electric and potential fields due to various charge distributions. 28. Compute static electric field and electric force. 29. Compute potential, , Electric flux density, Capacitance using Poisson's and Laplace's equations 30. Compute Energy Expended in Moving a Point Charge
Indicative Contents المحتويات الإرشادية	1. Course introduction (4 hrs) 2. Theoretical lectures (24 hrs)

Description	Review of vector calculus. Coulomb's law and electric field intensity: Coulomb's law, electric field intensity field of n-point charges, field of a continuous and volume charge distributions, fields the charge and sheet charge, streamlines and sketches of fields. Electric flux density and Gauss's law: Electric flux density, Gauss's law, application of Gauss's law, divergence, Maxwell's first equation. Energy and potential: Energy expanded in moving appoint charge in an electric field; definition of potential difference and potential; potential field of appoint charge and system of charges; potential gradient; dipole. Conductors, dielectrics and capacitance: Current and current density; continuity of current; conductor properties and boundary conditions, nature of dielectric materials; boundary conditions for perfect dielectric materials; capacitance.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	In this course, students are guided by: • Using different examples. • Using different styles of discussion that aim to connect the theoretical and practical sides. • Asking questions and giving exercises that require analysis and conclusions related to lectures. • Encourage students to participate in discussions and do the practical work. • Encourage students to work in groups.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

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	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3.4
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية



		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	6 and 12	LO #1 to #6
	Assignments	2	5% (10)	2 and 13	LO #3 to #6
	Projects / Lab.				
	Report	2	10% (20)	13	LO #3, #4 and #6
Summative assessment	Midterm Exam	1hr	10% (10)	9	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Review of Vector Analysis: Scalars and vectors, Unit vector, Vector addition and subtraction, Position and distance vectors, Dot product, Cross product, Scalar triple product, Vector triple product, Components of a vector,
Week 2	Cartesian co-ordinate system, Circular cylindrical co-ordinate system, Spherical co-ordinate system, transformation from one co-ordinate to other co-ordinate systems
Week 3	Static Electric Fields: Coulomb's law, Electric field intensity,
Week 4	Field Arising from a Continuous Volume Charge Distribution
Week 5	Electric field due to point charges, Electric Field due to Line Charge,
Week 6	Electric Field due to Sheet of Charge
Week 7	Electric Flux Density, Streamlines and Sketches of Fields,
Week 8	Gauss' law and its applications, Divergence theorem,
Week 9	Energy Expended in Moving a Point Charge in an Electric Field,
Week 10	Definition of Potential Difference and Potential,
Week 11	The Potential Field of a Point Charge, The Potential Field of a System of Charges,
Week 12	Potential gradient, Electric dipole, Energy Density in the Electrostatic Field
Week 13	Conductors, Dielectrics: Current and current density, Ohm's law in point form, Continuity equation,
Week 14	Properties of Conductor, Semiconductors and Dielectric Materials,
Week 15	Conductor-dielectric boundary condition, Dielectric-dielectric boundary condition, Polarization in dielectrics,

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر



	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	W. H. Hayt, J. A. Buck, "Engineering Electromagnetics", McGraw Hill Education - M.N.O. Sadiku, S.V. Kulkarni, "Principles of Electromagnetics", Oxford University	Yes
Recommended Texts	- Joseph A. Edminister, Mahmood Nahvi, "Electromagnetics", Schaum's Outline Series - Steven W. Ellingson, "Electromagnetics", Blacksburg, Virginia	Yes

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.

الملحق : وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information



معلومات المادة الدراسية

Module Title	Electromagnetic Fields II			Module Delivery	
Module Type	Core			☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
Module Code	COE 211				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGII	Semester of Delivery		2
Administering Department		BSc - COMM	College	College of Engineering	
Module Leader	م.م. محمد ناظم جواد		e-mail		
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor			e-mail	E-mail	
Peer Reviewer Name			e-mail	E-mail	
Scientific Committee Approval Date		2024/9/1	Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	COE 206: Electromagnetic fields I	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives	Study of electromagnetic fields is basically concerned with study of charges at rest and in motion. Electromagnetic principles serve as fundamentals for detailed and in-depth study of communication engineering and are indispensable for analysis and understanding of various subjects in communication engineering like antennas, waves propagation, microwaves, radar and so on.
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Module Learning Outcomes مخرجات التعلم للمادة الدراسية	31. Derive forces and torques in magnetic fields, forces due to current carrying conductors and their inter-relationship with magnetic field 32. Compute Capacitance, Capacitance of two wire line. 33. Compute Magnetic boundary conditions 34. Analyze Time varying fields. 35. Analyze Maxwell's equations in different forms (point & integral) and apply them to diverse engineering problems 36. Compute Magnetic flux and magnetic flux density.
Indicative Contents المحتويات الإرشادية	1. Course introduction (4 hrs) 2. Theoretical lectures (24 hrs)
Description	Poisson and Laplace's equations. Steady magnetic field: Boit-savart law, amperes law, curl; stokes theorem; magnetic flux, magnetic flux density, scalar and vector magnetic potentials. Magnetic forces and materials: Force on moving charge, force on differential current elements. Force between current differential elements, force and torque on a closed circuit, magnetization and permeability, magnetic boundary conditions, magnetic condition, magnetic circuit. Time-varying fields and Maxwell's equations: Faraday's law, displacement current; Maxwell's equations in point form; Maxwell's equations in integral form, wave equations, wave propagation in different media.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	In this course, students are guided by: - Using different examples. - Using different styles of discussion that aim to connect the theoretical and practical sides. - Asking questions and giving exercises that require analysis and conclusions related to lectures. - Encourage students to participate in discussions and do the practical work. - Encourage students to work in groups.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	48	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	3
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	52	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.4



Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100
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Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	5% (10)	6 and 12	LO #1 to #3 and #4 to #6
	Assignments	2	5% (10)	2 and 13	LO #3 to #6
	Projects / Lab.				
	Report	2	10% (20)	13	LO #3, #4 and #6
Summative assessment	Midterm Exam	1hr	10% (10)	9	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Poisson's and Laplace's equations: Poisson's equation, Laplace's equation, Uniqueness theorem,
Week 2	Solution of Poisson's and Laplace's equation, Application of Poisson's and Laplace's equations
Week 3	Capacitance, Capacitance of two wire line
Week 4	Steady Magnetic Fields: Biot-Savart's law, Ampere's law,
Week 5	Curl operation, Stoke's theorem
Week 6	Magnetic flux and magnetic flux density,
Week 7	Scalar and vector magnetic potentials,
Week 8	Steady magnetic field produced by current carrying conductors
Week 9	Magnetic forces, materials and inductance: Force on a moving charge, Force on a differential current element,
Week 10	Force between differential current elements,
Week 11	Nature of magnetic materials, Magnetization and Permeability,
Week 12	Magnetic boundary conditions,
Week 13	Magnetic circuit, Inductance and mutual inductances
Week 14	Time varying fields and Maxwell's equations: Faraday's law, Transformer and motional electromotive forces, Displacement current,



Week 15 Maxwell's equations in point form, Maxwell's equations in integral form,

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	
Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	W. H. Hayt, J. A. Buck, "Engineering Electromagnetics", McGraw Hill Education - M.N.O. Sadiku, S.V. Kulkarni, "Principles of Electromagnetics", Oxford University	Yes
Recommended Texts	- Joseph A. Edminister, Mahmood Nahvi, "Electromagnetics", Schaum's Outline Series - Steven W. Ellingson, "Electromagnetics", Blacksburg, Virginia	Yes

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.



الملحق : وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	MATLAB Programming		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☒ Practical ☐ Seminar
Module Code	COE 205		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGII	Semester of Delivery	1
Administering Department	BSc - COMM	College	College of Engineering
Module Leader	م.د. مرتجى ساري علي	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	2024/9/1	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 Objectives أهداف المادة الدراسية	51. The student learns about the basic construction and operation programming language. And be able to apply appropriate biasing to secure operation in the active area. 52. The student learns about the MATLAB Interactive Sessions, Menus and the toolbar, Computing with Matlab, Script files and the Editor Debugger, and Matlab Help System. 53. Identify and be able to explain the variables and how treat with its. 54. Being able to test and running the program to solve some equations. 55. The student will be able to write Arrays, Multidimensional, Arrays, Element by Element Operations, Polynomial Operations Using Arrays. 56. be able to grate Elementary Mathematical Functions, User Defined Functions, Advanced Function Programming, Working with Data Files. 57. The student will also be able to Programming Techniques: Program Design and Development, Relational Operators and Logical Variables, Logical Operators and Functions, Conditional Statements, Loops, The Switch Structure, Debugging Mat Lab Programs. 58. Be able to Plotting: XY- plotting functions, Subplots and Overlay plots, Special Plot types, Interactive plotting, Function Discovery, 3-D plots. 59. The student will also be able to Linear Algebraic Equations: Elementary Solution Methods, solving system of linear equations. 60. Introduction Symbolic Processing with Matlab: Symbolic Expressions, Algebra, Calculus (Limits and series), Symbolic Linear Algebra, symbolic plotting.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	37. Enabling student to know how to treat with mathematical equations and solve functions. 38. Enabling student to know how to plotting and display figures. 39. Enabling student to write array and treat with it.		

	40. Enabling to grate Matlab file and function. 41. Enabling student to test and run the written program and display result and error. 42. Enabling student Design simple algorithms to solve problems
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (4 hrs) • Working with Power point (8 hrs) • Theoretical lectures (15 hrs) • Lap (30 hrs)
Description	MATLAB: MATLAB Interactive Sessions, Menus and the toolbar, Computing with Matlab, Script files and the Editor Debugger, and Matlab Help System. Arrays: Arrays, Multidimensional Arrays, Element by Element Operations, Polynomial Operations Using Arrays. Functions & Files: Elementary Mathematical Functions, User Defined Functions, Advanced Function Programming, Working with Data Files. Programming Techniques: Program Design and Development, Relational Operators and Logical Variables, Logical Operators and Functions, Conditional Statements, Loops, The Switch Structure, Debugging Mat Lab Programs. Plotting: XY- plotting functions, Subplots and Overlay plots, Special Plot types, Interactive plotting, Function Discovery, 3-D plots. Linear Algebraic Equations: Elementary Solution Methods, solving system of linear equations. Symbolic Processing With Matlab: Symbolic Expressions, Algebra, Calculus (Limits and series), Symbolic Linear Algebra, symbolic plotting. Introduction to Simulink.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	In this course, students are guided by: • Using different examples. • Using different styles of discussion that aim to connect the
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	theoretical and practical sides. - Asking questions and giving exercises that require analysis and conclusions related to lectures. - Encourage students to participate in discussions and do the practical work. - Encourage students to work in groups.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

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	27	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
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Week 1	Introduction to MATLAB, MATLAB Interactive Sessions, Menus and the toolbar, Computing with Matlab, Script files and the Editor Debugger, and Matlab Help System.
Week 2	Programming Techniques: Program Design and Development, Relational Operators and Logical Variables, Logical Operators and Functions,
Week 3	Conditional Statements
Week 4	Loops
Week 5	The Switch Structure, Debugging Mat Lab Programs.
Week 6	Symbolic Processing With Matlab: Symbolic Expressions, Algebra, Calculus (Limits and series), Symbolic Linear Algebra,
Week 7	Linear Algebraic Equations: Elementary Solution Methods, solving system of linear equations
Week 8	Arrays: Arrays, Multidimensional Arrays, Element by Element Operations,
Week 9	Polynomial Operations Using Arrays
Week 10	Plotting: XY- plotting functions,
Week 11	Subplots and Overlay plots
Week 12	Special Plot types, Interactive plotting, Function Discovery, 3-D plots.
Week 13	Functions & Files: Elementary Mathematical Functions,
Week 14	User Defined Functions, Working with Data Files
Week 15	Introduction to Simulink.
Week 16	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to MATLAB, MATLAB Interactive Sessions, Menus and the toolbar, Computing with Matlab, Script files and the Editor Debugger, and Matlab Help System.
Week 2	Programming Techniques: Program Design and Development, Relational Operators and Logical Variables, Logical Operators and Functions,
Week 3	Conditional Statements
Week 4	Loops
Week 5	The Switch Structure, Debugging Mat Lab Programs.



Week 6	Symbolic Processing With Matlab: Symbolic Expressions, Algebra, Calculus (Limits and series), Symbolic Linear Algebra,
Week 7	Linear Algebraic Equations: Elementary Solution Methods, solving system of linear equations
Week 8	Arrays: Arrays, Multidimensional Arrays, Element by Element Operations,
Week 9	Polynomial Operations Using Arrays
Week 10	Plotting: XY- plotting functions,
Week 11	Subplots and Overlay plots
Week 12	Special Plot types, Interactive plotting, Function Discovery, 3-D plots.
Week 13	Functions & Files: Elementary Mathematical Functions,
Week 14	User Defined Functions, Working with Data Files
Week 15	Introduction to Simulink.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	MATLAB Guide, 3e Desmond J. Higham, <i>University of Edinburgh</i> ; Nicholas J. Higham, <i>University of Manchester</i>	Yes
Recommended Texts	MATLAB Programming for Engineers Stephen J. Chapman	No
Websites	https://www.mathworks.com/?s_tid=gn_logo	

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.

الملحق : وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Probability and Random Processes		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 210		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	2
Administering Department	BSc - COMM	College	College of Engineering
Module Leader	م.م. ضحى كريم خلف	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	



Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	2024/9/1	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 Objectives أهداف المادة الدراسية	61. The objective of this module is to provide students with a comprehensive understanding of the fundamental principles of probability and random processes. 62. developing a solid foundation in probability theory, understanding various types of random variables and their distributions. 63. Exploring the concepts of random vectors and processes. 64. Learning how to apply these principles to practical problems and real-world scenarios, particularly in the fields of communication engineering.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	43. Understand and apply the basic concepts of probability, including joint and conditional probability, Bayes' theorem, and statistical independence. 44. Define and distinguish between discrete and continuous random variables, and work with their cumulative distribution functions, probability mass functions, and probability density functions. 45. Calculate and interpret expectations, moments, and functions of random variables. 46. Analyze random vectors and variables through joint, marginal, and conditional distributions and densities, and understand the concepts of correlation, covariance, and higher moments. 47. Apply the concepts of independent, uncorrelated, and orthogonal random variables to various problems. 48. Explore the properties and applications of random and stationary processes, including renewal processes, queues, Wiener processes, and Gaussian

	processes.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. 1- Elementary Concepts in Probability: • Introduction to Probability and Counting • Joint and Conditional Probability • Bayes' Theorem • Statistical Independence • Bernoulli Trials 2- Counting methods (4 types of counting) 3- Discrete and Continuous Random Variables: • Cumulative Distribution Functions (CDF) • Probability Mass Functions (PMF) and Probability Density Functions (PDF) • Families of Discrete and Continuous Random Variables • Expectation and Moments • Functions of Random Variables 4- Random Vectors and Variables: • Joint, Marginal, and Conditional Distributions and Densities • Correlation, Covariance, and Higher Moments • Independent, Uncorrelated, and Orthogonal Random Variables • Sum of Random Variables and Other Functions • Jointly Gaussian Random Variables • Application to Estimation
Description	Elementary concepts in probability: Introduction to Probability and Counting, Joint and Conditional Probability, Bayes' theorem Statistical Independence; Bernoulli Trials. Discrete and continues random variables: Cumulative distribution, probability mass, and probability density functions; families of discrete and continuous random variables, expectation; moments, functions of a random variables. Random vectors and variables: Joint, marginal and conditional distributions and densities; correlation, covariance and higher moments; independent, uncorrelated and orthogonal random variables; sum of random variables (and other functions); jointly Gaussian random variables; application to estimation. Random and Stationary Processes.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	In this course, students are guided by: • Using different examples. • Using different styles of discussion that aim to connect the theoretical and practical sides. • Asking questions and giving exercises that require analysis and conclusions related to lectures. • Encourage students to participate in discussions and do the practical work. • Encourage students to work in groups. • Using brainstorm and imagination to encourage student to solve problem
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	3.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

		Time/Num ber	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	1	10% (10)	4, 8 and 12	LO #1 to #6,
	Assignments	2	10% (20)	7 and 13	LO #1 to #6, LO #7 to #14
	Projects / Lab.				
	Report	2	5% (10)	13	All
Summative assessment	Midterm Exam	1hr	10% (10)	9	LO #1 - #6
	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 Probability and Counting
Week 2	Joint and Conditional Probability
Week 3	Bayes' Theorem and Statistical Independence
Week 4	Counting methods (draw with and without replacement)
Week 5	Counting methods (draw with and without order)
Week 6	Introduction to discrete random variables
Week 7	Bernoulli trials and Probability mass functions (PMF) and examples
Week 8	Expectation, Moments, and Functions of Random Variables in discrete RV
Week 9	Mid term
Week 10	Introduction to continuous random variables, Probability density functions (PDF) and cumulative distribution functions (CDF)
Week 11	Key continuous distributions and their applications
Week 12	Expectation, Moments, and Functions of Random Variables in continuous random variable
Week 13	Random Vectors - Joint, Marginal, and Conditional Distributions
Week 14	Correlation, Covariance, and Higher Moments
Week 15	Independent, Uncorrelated, and Orthogonal Random Variables
Week 16	Random and Stationary Processes

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Week 9	
Week 10	
Week 11	



Week 12	
Week 13	
Week 14	
Week 15	

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	H. Pishro-Nik, "Introduction to probability, statistics, and random processes", Kappa Research LLC, 2014.	Yes
Recommended Texts		No
Websites	https://www.probabilitycourse.com ,	

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.



الملحق : وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		
Module Title	Analog Communication	Module Delivery
Module Type	Core	☒ Theory
Module Code	COE 207	



ECTS Credits	5	☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar	
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	2
Administering Department	BSc - COMM	College	College of Engineering
Module Leader	م.م. علاء ابراهيم حسين	e-mail	montadar.abas@uodiyala.edu.iq
Module Leader's Acad. Title	Associated Professor	Module Leader's Qualification	PHD
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	2024/9/1	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	COE 201 : Signals and Systems	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1. To show the main components of the analog communication systems. 2. To introduce the theory behind carrying a signal over another signal. 3. To learn how to attach a message signal to the carrier signal. 4. To show the various types of modulation techniques. 5. To show the effect on the signals.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	49. Understanding the main components of the analog communication system. 50. Show how to recognize the differences between modulation types. 51. Show how to distinguish between the different components of modulations. 52. List the basic components of the communication systems.



	53. Understanding linear modulation family. 54. Understanding angle/exponential modulation family. 55. Show the interaction between message signal and carrier signal. 56. Understanding the theory behind the generation of each modulation type. 57. Understanding the receivers' systems. 58. Understanding the reaction between signals and noise.
Indicative Contents المحتويات الإرشادية	• Introduction and Definitions of communication systems (4 hrs). • Linear Modulation (16 hrs). • Linear Demodulations (8 hrs). • Angle Modulation (16 hrs). • Noise in Communication Systems (12 hrs). • Receiver Systems (4 hrs).
Description	Introduction to Communication Systems: Analog systems, main components of analog communication systems, definitions of message and carrier signals. Linear modulation: Double Side Band Suppressed Carrier (DSB-SC) amplitude modulation, conventional Amplitude Modulation (AM/DSB-LC), Modulation Index, Spectrum of AM Signal, Single Side Band (SSB), Vestigial Side Band (VSB), Power Calculations in AM Systems, Application of AM Systems. Linear Demodulators: Synchronous/coherent demodulation, carrier recovery (squaring loop and Phase Locked Loop (PLL)), asynchronous/noncoherent demodulation (Diode detector). Angle Modulation: Phase and Frequency Modulation and their Relationship, Phase and Frequency Deviation, Spectrum of an FM Signal, Bandwidth of Sinusoidally Modulated FM Signal, Narrow Band FM (NBFM) Wide Band FM (WBFM), Phasor Diagram for FM Signals. FM Generation: Parameter variation method, indirect method of frequency modulation (Armstrong method), PLL FM Demodulator, pre-emphasis and de-emphasis. Noise In AM & FM Systems: Sources of noise, resistor noise, shot noise, calculation of noise in a linear system, Noise in AM Systems, Noise in Angle Modulation Systems, Comparison between AM and FM with respect to Noise, Threshold Improvement in Discriminators. Receivers: Frequency Translation and Mixing, Interference, Extensions of the super-heterodyne principles.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The primary approach for administering this module is expected to motivate students to participate in the exercises while simultaneously improving and developing their capacity for critical thought. This will be accomplished via lessons, collaborative tutorials, and the consideration of straightforward trials
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including selecting tasks that are appealing to students.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	32	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2.1
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Analog and digital systems, main components of analog communication systems, definitions of message and carrier signals.
Week 2	Double Side Band Suppressed Carrier (DSB-SC) amplitude modulation.
Week 3	conventional Amplitude Modulation (AM/DSB-LC), Power Calculations in AM Systems.
Week 4	Modulation Index, Spectrum of AM Signal, Single Side Band (SSB) Amplitude Modulation.
Week 5	Vestigial Side Band (VSB) Amplitude Modulation, Application of AM Systems.



Week 6	Synchronous/coherent demodulation, carrier recovery (squaring loop and Phase Locked Loop (PLL)).
Week 7	Asynchronous/noncoherent demodulation (Diode detector).
Week 8	Phase and Frequency Modulation and their Relationship, Phase and Frequency Deviation, Spectrum of an FM Signal.
Week 9	Bandwidth of Sinusoidally Modulated FM Signal, Effect of the Modulation Index on bandwidth.
Week 10	Spectrum of Constant Bandwidth FM, Phasor Diagram for FM Signals.
Week 11	FM Generation: Parameter variation method, indirect method of frequency modulation (Armstrong method), PLL FM Demodulator, pre-emphasis and de-emphasis.
Week 12	Sources of noise, resistor noise, shot noise, calculation of noise in a linear system.
Week 13	Noise in AM Systems, Noise in Angle Modulation Systems.
Week 14	Comparison between AM and FM with respect to Noise, Threshold Improvement in Discriminators.
Week 15	Frequency Translation and Mixing, Interference, Extensions of the super-heterodyne principles.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Generation of different message signals including microphone and signal generator.
Week 2	Amplitude modulation using transistor Part – 1 (DSB-LC).
Week 3	Amplitude modulation using diode and Band Pass Filter (BPF) Part – 2 (DSB-LC)
Week 4	Amplitude modulation Part – 3: Design by Student.
Week 5	Amplitude modulation Part – 4: (DSB-SC)
Week 6	Amplitude Demodulation: Part – 1 (using Passive components).
Week 7	Amplitude Demodulation: Part – 2 (using Active components).
Week 8	Amplitude Demodulation: Part – 3, Design by Students.
Week 9	Voltage Controlled Oscillator (VCO) using CD4046.
Week 10	VCO by student design.
Week 11	Phase Locked Loop (PLL) using CD4046.
Week 12	Frequency modulation using CD4046.
Week 13	Frequency modulation using 555 – timer.
Week 14	Frequency modulation using 565 integrated circuit.
Week 15	Frequency modulation by student design.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	John G. Proakis, Masoud Salehi, Fundamentals of communication systems, second edition, Pearson Education, 2014, SBN: 9780133354850.	Yes



	Simon Haykin, Michael Moher, Introduction to Analog and Digital Communications, Second Edition, John Wiley & Sons, 2007, ISBN: 9780471432227.	
Recommended Texts	B. P. Lathi & Zhi Ding, Modern digital and analog communication systems, fourth edition, Oxford University Press, 2009, ISBN:9780195331455.	No
Websites	N/A	

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
جرائم نظام البعث في العراق

Module Information

معلومات المادة الدراسية

Module Title	جرائم نظام البعث في العراق		Module Delivery	
Module Type	Basic learning activities		☒ Theory ☒ Lecture ☐ Lab ☐ L Tutorial ☐ Practical ☒ Seminar	
Module Code	MUC 23004			
ECTS Credits	2			
SWL (hr/sem)	50			
Module Level	2	Semester of Delivery		
Administering Department		جميع اقسام الكلية	College	College of
Module Leader	د. قائد سلمان		e-mail	
Module Leader's Acad. Title			Module Leader's Qualification	
Module Tutor			e-mail	
Peer Reviewer Name			e-mail	
Scientific Committee Approval Date	9/09/2024		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 Objectives	أهداف المادة الدراسية 1. التعرف على ماهية الجريمة لغة واصطلاحاً وماهية أقسام الجرائم. 2. التعرف على جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م. 3. تنمية وعي الطالب بجرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا لسنة 2005م. 4. دراسة الجرائم التي ارتكبتها نظام البعث على مدى سنوات طويلة واثارها النفسية والاجتماعية. 5. التعرف على صور انتهاكات حقوق الانسان وجرائم السلطة والتعرف على الجرائم البيئية لنظام البعث في العراق. 6. تعزيز الوعي بحقيقة ما جرى من مآسي المقابر الجماعية المرتكبة من النظام البعثي في العراق.
Module Learning	1. تمكين الطالب من معرفة المفاهيم النظرية للجرائم وأركان الجرائم. 2. تمكين الطالب من معرفة أقسام الجرائم.

Outcomes مخرجات التعلم للمادة الدراسية	3. تمكين الطالب من معرفة قانون المحكمة الجنائية العراقية العليا لسنة 2005. 4. فهم تشكيل المحكمة الجنائية العراقية العليا لسنة 2005 والتعرف على تشكيل المحكمة إجراءات التقاضي امام المحكمة. 5. يتعلم الطالب أنواع الجرائم الدولية على وفق النظام الاساسي للمحكمة الجنائية الدولية. 6. معرفة الطالب بالآثار النفسية والاجتماعية لجرائم نظام البعث. 7. يتمكن الطالب من فهم موقف النظام البعثي من الدين من خلال فهم عقيدة النظام السياسي سبباً لفهم موقف النظام من الدين. 8. يتمكن الطالب من التعرف على صور انتهاكات القوانين العراقية وانتهاكات حقوق الانسان وجرائم السلطة. 9. تمكين الطالب من التعرف على بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث. 10- يتعرف الطالب على أماكن السجون والاحتجاز لنظام البعث. 11- معرفة الطالب بالجرائم البيئية وبآثار الجرائم البيئية لنظام البعث، ويتعرف جرائم المقابر الجماعية.
Indicative Contents المحتويات الإرشادية	الجزء الاول : جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا لعام 2005م، والجرائم النفسية والاجتماعية وآثارها وابرز انتهاكات النظام البعثي في العراق: التعريف بالجريمة لغة وأصطلاحاً، اركان واقسام الجريمة (2 ساعة). جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م : أنواع الجرائم الدولية، القرارات الصادرة من المحكمة الجنائية العليا (2 ساعة). وابرز القضايا التي نظرت فيها المحكمة (2 ساعة). الجرائم النفسية والاجتماعية وآثارها وابرز انتهاكات النظام البعثي في العراق: الجرائم النفسية، اليات الجرائم النفسية (2 ساعة). آثار الجرائم النفسية ، الجرائم الاجتماعية (2 ساعة) . عسكرة المجتمع، موقف النظام البعثي من الدين (2 ساعة) . انتهاكات القوانين العراقية، صور انتهاكات حقوق الانسان (2 ساعة) . جرائم السلطة، بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث، أماكن السجون والاحتجاز لنظام البعث (2 ساعة). الجزء الثاني : الجرائم البيئية لنظام البعث في العراق، جرائم المقابر الجماعية : الجرائم البيئية لنظام البعث في العراق: التلوث الحربي والاشعاعي – أستعمال الاسلحة المحرمة دولياً ومخاطر الألغام. (2 ساعة). التلوث بالمواد المشعة، آثار أستخدام الاسلحة المحرمة دولياً (2 ساعة). تدمير المدن والقرى (سياسة الارض المحروقة): قصف المدن، قصف العتبات المقدسة والمساجد والحسينيات، معركة نهر جاسم ، حرق آبار النفط (2 ساعة). تجفيف الالهوارو آثارها البيئية والاجتماعية والاقتصادية (2 ساعة). ، تجريف بساتين النخيل والاشجار والمزروعات (2 ساعة). جرائم المقابر الجماعية وموقف الامم المتحدة منها (2 ساعة). احداث المقابر الجماعية المرتكبة من النظام البعثي في العراق، التصنيف الزمني لمقابر إبادة الجماعية في العراق للمدة 1963- 2003 (2 ساعة).
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	1- زيادة وعي الطالب بالجرائم التي ارتكبتها نظام البعث في العراق وحقيقة ما جرى من مآسي وويلات بحق الشعب العراقي. 2- اكتساب الطالب ثقافة عامة بماهية الجرائم واركانها واقسامها وموقف المشرع العراقي منها. 3- زيادة وعي الطالب بموقف القانون الدولي والمحاكم الجنائية الدولية من الجرائم والانتهاكات التي ترتكبتها الانظمة السلطوية.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ أسبوعاً			
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)	17	Unstructured SWL (h/w)	1.1



الحمل الدراسي غير المنتظم للطالب خلال الفصل		الحمل الدراسي غير المنتظم للطالب أسبوعياً	
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	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / tutorial.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	1 hr	10% (10)	7	LO # 1-7
	Final Exam	2hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	محاضرة تعريفية عن المادة واهميتها.
Week 2	التعريف بالجريمة لغة واصطلاحاً، أقسام الجريمة، جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005م ، أنواع الجرائم الدولية.
Week 3	القرارات الصادرة من المحكمة الجنائية العليا، وأبرز القضايا التي نظرت فيها المحكمة.
Week 4	الجرائم النفسية، اليات الجرائم النفسية.
Week5	اثار الجرائم النفسية، الجرائم الاجتماعية
Week 6	عسكرة المجتمع، موقف النظام البعثي من الدين.
Week 7	انتهاكات القوانين العراقية، صور انتهاكات حقوق الانسان، جرائم السلطة.
Week 8	بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث، أماكن السجون والاحتجاز لنظام البعث.
Week 9	الجرائم البيئية لنظام البعث في العراق: التلوث الحربي والاشعاعي – استعمال الاسلحة المحرمة دولياً ومخاطر الالغام.



Week 10	التلوث بالمواد المشعة، أثار استخدام الأسلحة المحرمة دولياً
Week 11	تدمير المدن والقرى (سياسة الأرض المحروقة).
Week 12	تجفيف الأهوار أثارها البيئية والاجتماعية والاقتصادية.
Week 13	تجريف بساتين النخيل والأشجار والمزروعات.
Week 14	جرائم المقابر الجماعية، أحداث المقابر الجماعية المرتكبة من النظام البعثي في العراق.
Week 15	التصنيف الزمني لمقابر الإبادة الجماعية في العراق للمدة 1963 - 2003.
Week 16	الامتحان النهائي

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	المنهج المقرر الدراسي للجامعات الحكومية و الأهلية كافة كتاب وزارة التعليم والبحث العلمي ذي العدد (ت م 3 / 7588 في 2023/10/19)	نعم
Recommended Texts		لا
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 اللغة العربية

Module Information			
معلومات المادة الدراسية			
Module Title	اللغة العربية		Module Delivery
Module Type	Basic learning activities		☒ Theory ☒ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	MUC 24002		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	UGII	Semester of Delivery	2
Administering Department	BSc - COMM	College	Al-Mansour University College
Module Leader	د. وجدان صادق	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	E-mail
Peer Reviewer Name		e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
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Co-requisites module	None	Semester	
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Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	1- تعريف الطلبة اهم المفاتيح الأساس في التعامل بلغة عربية فصيحة خالية من اي خطأ أو لحنٍ وكيفية التعلم فيما يخص الأدب والنحو والبلاغة والاملاء العربية وكل هذا لغير الاختصاص. 2- رفع القدرات التعبيرية للطلاب، وزيادة ثروتهم اللغوية ، ومساعدتهم على استخدام العبارة المناسبة بشكل دلالي واضح. 3- تدريب الطلبة على التحدث، والتنظيم المنطقي للأفكار، مع الحرص على التمسك باللغة العربية الفصحى . 4- رفع الأداء اللغوي العام لدى الطلبة. 5- تمكين الطلبة من الكتابة والتعبير والحديث بلغة عربية فصيحة وواضحة. 6- مساعدة الطلبة في التعبير عن افكارهم من خلال المناقشة والحوار بلغة سهلة وفصيحة . 7- جعل الطلبة قادرين على اكتساب خزين لغوي من الكلمات واللفاظ والتعبير الفصيحة. 8- تعلم الطلبة الحفاظ على لغة القرآن التراث العربي الاصيل.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	الاهداف المعرفية والمهارية: 1- يعرف اساليب اللغة العربية. 2- يوظف ادوات الترتيم عند الكتابة . 3- يتدرب على كيفية تحليل النصوص الادبية . 4- يعرب بعض الامثلة والتمارين عن الجملة الاسمية والفعلية . 5- يناقش بعض النصوص القرآنية والادبية . 6- يبين الفرق بين علامات الاعراب الاصلية والفرعية. 7- يميز بين الافعال والاسماء في الجمل. 8- يتدرب على القراءة الواضحة والإلقاء . 9- يتدرب على الكتابة بخط حسن من خلال التعريف بأنواع الخطوط العربية، وكتابة كل حرف، ثم كتاب الجمل والعبارات بخط الرقعة. 10- يميز بين حمزة القطع وهمزة الوصل عند الكتابة . 11- يميز بين حرفي الضاد والظاء في الكتابة والنطق. 12- يميز بين التاء المربوطة والمفتوحة اثناء الكتابة. 13- أحكام كتابة الضاد والظاء.
Indicative Contents المحتويات الإرشادية	توضيح أهمية اللغة العربية وفوائدها بالنسبة للطلاب الجامعي (2 ساعة). اللغة، تفسير وتحليل أول عشرة آيات من سورة الكهف مع بيان فضل السورة وسبب تسميتها واهم الواجه البلاغية والنحوية . (2 ساعة) اللغة، تفسير وتحليل ثلاثة آيات من سورة الحجرات مع بيان فضل السورة وسبب تسميتها واهم الواجه البلاغية والنحوية . (2 ساعة) الادب، تحليل ثلاثة عشر سطرأ من قصيدة سفر ايوب في الشعر الحر للشاعر العراقي بدر شاكر السياب مع حياة الشاعر واهم الواجه البلاغية والنحوية في القصيدة. (2 ساعة)

	الادب، تحليل ثمانية أبيات في الحماس للشاعر ابي الطيب المتنبي مع حياة الشاعر مع اهم الواجه البلاغية والنحوية في القصيدة. (2 ساعة) قواعد اللغة العربية وأهميتها معرفة اقسام الكلام (الاسم والفعل والحرف) واهم علاماتها. قواعد اللغة العربية :- النكرة والمعرفة، انواع المعارف (العلم) شرح موضوع (اسم العلم والاسم المركب) مع الأمثلة. (2 ساعة) قواعد اللغة العربية، (الضمائر) شرح موضوع (ضمائر الرفع والنصب والجر) مع الأمثلة. (2 ساعة) اللغة، حفظ وتفسير وتحليل سورة الاعلى مع بيان فضل السورة وسبب تسميتها واهم الواجه البلاغية والنحوية. الادب، تحليل ثمانية أبيات من قصيدة (كن بلسمًا) للشاعر (ايليا ابي ماضي) مع حياة الشاعر مع اهم الحالات الاعرابية والبلاغية. (2 ساعة) قواعد اللغة العربية، شرح موضوع (اسماء الاشارة) مع الأمثلة وحالات الاعراب، شرح موضوع (المعرف بالإضافة) مع الأمثلة وحالات الاعراب. (2 ساعة) قواعد اللغة العربية، شرح موضوع (الحال) معرفة الحال وصاحبها وما هي انواع الحال مع الأمثلة وحالات الاعراب. (2 ساعة) الأملاء في اللغة العربية، علامات الترقيم وأهميتها في اللغة العربية. (2 ساعة) قواعد اللغة العربية، شرح موضوع (العدد) معرفة تميز العدد وماهي اقسام العدد مع الأمثلة وحالات الاعراب.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	- المحاضرة والمشاركة. - المناقشة والحوار. - العصف الذهني. - كتابة التقارير عن الموضوع. - السؤال والجواب .
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	0

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	1	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (20)	2 and 12	LO #3, #4 and #6, #7
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	توضيح أهمية اللغة العربية وفوائدها بالنسبة للطالب الجامعي.
Week 2	اللغة، تفسير وتحليل أول عشرة آيات من سورة الكهف مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية.
Week 3	اللغة، تفسير وتحليل ثلاثة آيات من سورة الحجرات مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية.
Week 4	الأدب، تحليل ثلاثة عشر سطرًا من قصيدة سفر أيوب في الشعر الحر للشاعر العراقي بدر شاكر السياب مع حياة الشاعر وأهم الأوجه البلاغية والنحوية في القصيدة.
Week 5	الأدب، تحليل ثمانية أبيات في الحماس للشاعر أبي الطيب المتنبي مع حياة الشاعر مع أهم الأوجه البلاغية والنحوية في القصيدة.
Week 6	قواعد اللغة العربية وأهميتها
Week 7	معرفة أقسام الكلام (الاسم والفعل والحرف) وأهم علاماتها.
Week 8	قواعد اللغة العربية :- النكرة والمعرفة، أنواع المعارف (العلم) شرح موضوع (اسم العلم والاسم المركب) مع الأمثلة.
Week 9	قواعد اللغة العربية، (الضمائر) شرح موضوع (الضمائر الرفع والنصب والجر) مع الأمثلة.
Week 10	اللغة، تفسير وتحليل سورة الأعلى مع بيان فضل السورة وسبب تسميتها وأهم الأوجه البلاغية والنحوية.
Week 11	الأدب، تحليل ثمانية أبيات من قصيدة (كن بلسمًا) للشاعر (إيليا أبي ماضي) مع حياة الشاعر مع أهم الحالات الاعرابية والبلاغية.
Week 12	قواعد اللغة العربية، شرح موضوع (اسماء الإشارة) مع الأمثلة وحالات الاعراب، شرح موضوع (المعرف بالإضافة) مع الأمثلة وحالات الاعراب.
Week 13	قواعد اللغة العربية، شرح موضوع (الحال) معرفة الحال وصاحبها وما هي أنواع الحال مع الأمثلة وحالات الاعراب.
Week 14	الأملاء في اللغة العربية، علامات الترقيم وأهميتها في اللغة العربية.



Week 13	قواعد اللغة العربية، شرح موضوع (العدد) معرفة تميز العدد وماهي اقسام العدد مع الأمثلة وحالات الاعراب.
Week 14	الأملاء في اللغة العربية، احكام الهمزة (حمزة الوصل، حمزة القطع، كتابة الهمزة في وسط الكلمة).
Week 15	الأملاء في اللغة العربية: احكام كتابة التاء المربوطة والمفتوحة والالف الممدودة والمقصورة.

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	1. القرآن الكريم. 2. كتاب البلاغة والتطبيق. 3. كتاب الأملاء الواضح . 4. منهاج اللغة العربية لغير الاختصاص. 5. قواعد الإملاء الصحيحة لعبد السلام محمد هارون	Yes
Recommended Texts	1. كتاب شرح ابن عقيل على الفية ابن مالك/ ابن عقيل عبد الله بن عبد الرحمن. 2. كتاب الميسر في اللغة العربية لغير الاختصاص/ الدكتور زياد طارق شولي 3. منهاج اللغة العربية العامة لغير الاختصاص/ عبد القادر حسن امين 4. معاني النحو للدكتور فاضل السامرائي	Yes



5. إعراب القرآن وتفسيره وبيانه لمحمود الدرويش

Websites

- 1- مكتبة المصطفى <http://www.al-mostafa.com/index.htm>
- 2- مكتبة مشكاة الإسلام <http://www.almeshkat.net/books/index.php>
- 3- الجمعية العلمية للغة العربية <http://www.imamu.edu.sa/arabiyah>
- منتديات الكتب المصورة <http://pdfbooks.net/vb/login.php>

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.

المرحلة الثالثة

3



الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Antennas Theory		Module Delivery
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 303		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII	Semester of Delivery	1
Administering Department	Communications Engineering	College	
Module Leader	د. مرتجى علي ساري	e-mail	
Module Leader's Acad. Title	Associate professor	Module Leader's Qualification	MSc in Electronics and Communication
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	30-8-2025	Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
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Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Objectives أهداف المادة الدراسية	65. To introduce the fundamental mathematical and electromagnetic concepts essential for understanding antenna theory. 66. To provide knowledge of the different types, characteristics, and applications of antennas. 67. To impart an understanding of the principles of antenna design and performance evaluation. 68. To develop knowledge of antenna array theory and its role in enhancing radiation characteristics.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate knowledge and understanding of the fundamental principles of antenna theory, including Maxwell’s equations, wave propagation, and radiation mechanisms. 2. Analyze and compare different types of antennas in terms of structure, performance, and application areas. 3. Apply appropriate mathematical and computational methods in the design and evaluation of antennas and antenna arrays. 4. Identify, formulate, and solve engineering problems related to antenna design using analytical and simulation-based approaches. 5. Communicate technical concepts and design solutions effectively through reports, presentations, and teamwork activities.		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (4 hrs) • Working with tutorial (11 hrs) • Theoretical lectures (30 hrs) • Lap (30hrs)		
Description	This module introduces the fundamental concepts of antenna theory and design. The course covers the physical principles of radiation, radiation patterns, near- and far-field regions, polarization, directivity, gain, and antenna efficiency. Basic types of antennas are studied, including dipole antennas, loop antennas, and simple aperture antennas, with emphasis on their radiation characteristics and practical applications in communication systems. An introduction to microstrip patch antennas and the basic concepts of antenna arrays is also provided. The course is designed to equip students with the foundational knowledge required for understanding and designing simple antenna structures used in engineering practice.		
Learning and Teaching Strategies استراتيجيات التعلم والتعليم			

Strategies	In this course, students are guided by: • Using different examples. • Using different styles of discussion that aim to connect the theoretical and practical sides. • Asking questions and giving exercises that require analysis and conclusions related to lectures. • Encourage students to participate in discussions and do the practical work. • Encourage students to work in groups.
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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	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	32	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.1
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)	6 and 12	LO #1 to #3 and #4 to #6
	Assignments	2	10% (10)	2 and 13	LO #3 to #6
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #3, #4 and #6
Summative assessment	Midterm Exam	2hr	10% (10)	9	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		



Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Review of Electromagnetic Theory and of Communication Systems, and the electrical properties of the transmission medium with Poynting Vector and Flow of Power
Week 2	Radio Channel, Analysis of the ideal dipole, the electric, magnetic fields, and the power of the ideal dipole
Week 3	Antenna types, Fundamental Parameters of Antennas: Radiation Pattern, Bandwidth, Beam Efficiency.
Week 4	Fundamental parameters: Far-Field Conditions and Field Regions, Beam Area, Radiation Power Density.
Week 5	Radiation Power Intensity, Directivity, Gain, Realized Gain, Antenna Efficiency, Antenna Impedance, Antenna Radiation Efficiency.
Week 6	Polarization, Linear polarization, Elliptical polarization, circular polarization, Axial Ratio,
Week 7	Effective Area/ Effective Aperture/ Capture Area, Physical Aperture, effective height
Week 8	The radio communication link, Maximum Directivity, and Maximum Effective Area
Week 9	Wire Antenna: Small Dipole, Thin linear antenna.
Week 10	Monopole antenna, small circular and square loop antenna.
Week 11	Arrays Antennas: Two-Element Array
Week 12	Arrays Antennas: N-Element Linear Array, Design Procedure of Arrays Antennas
Week 13	Antenna temperature
Week 14	Microstrip Antennas: Basic characteristics of microstrip antennas, Rectangular Patch antenna, Circular Patch antenna,
Week 15	Feeding methods, methods of analysis, and Design of rectangular patch antennas.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Antenna Manufacturing
Week 2	Antenna Ranges
Week 3	Radiation Patterns Measurements
Week 4	Radiation Patterns Measurements
Week 5	Gain Measurements
Week 6	Directivity Measurements
Week 7	Radiation Efficiency Measurements
Week 8	Impedance Measurements
Week 9	Current Measurements
Week 10	Polarization Measurements
Week 11	Polarization Measurements



Week 12	Scale Model Measurements
Week 13	Scale Model Measurements
Week 14	Yagi-Uda antenna design
Week 15	Helical antenna design

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- C.A. Balanis, Antenna Theory: Analysis and Design, 4th Edition, Wiley, 2016. - W.H. Hayt and J.A. Buck, Engineering Electromagnetics, 8th Edition, McGraw-Hill Education, 2012. - D.M. Pozar, Microwave Engineering, 4th Edition, Wiley, 2012.	Yes
Recommended Texts	- W.L. Stutzman and G.A. Thiele, Antenna Theory and Design, 3rd Edition, Wiley, 2013. - J.D. Kraus, Antennas, 2nd Edition, McGraw-Hill, 1988. - Ramesh Garg, Prakash Bhartia, Inder Bahl, and Apisak Ittipiboon, Microstrip Antenna Design Handbook, Artech House, 2001.	No
Websites	- Antenna Theory – https://www.antenna-theory.com : (Comprehensive educational resource on antenna fundamentals, types, arrays, and propagation concepts.) - IEEE Antennas and Propagation Society (APS) – https://aps.ieee.org : (Professional society providing access to technical resources, publications, and conferences in antennas and radio wave propagation.) - Electronics Tutorials – Antennas & Propagation – https://www.electronics-tutorials.ws/antenna/ant_1.html : (Practical tutorials covering antenna basics, propagation mechanisms, and related communication concepts.)	

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	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded



(0 – 49)	F – Fail	راسب	(0-44)	Considerable amount of work required

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

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Computer Network		Module Delivery
Module Type	CORE		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 304		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGIII	Semester of Delivery	
Administering Department	Communications Engineering	College	College of Engineering
Module Leader	م.م. عباس فاضل كاظم	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	30-8-2025	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 Objectives أهداف المادة الدراسية	The Computer Networks curriculum aims to introduce the student to computer networking skills and their basics, and to focus on the models used in them, their components, and protocols.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	A- Knowledge and Understanding A 1 - to understand the definition of computer networks in theory and practical A 2 - understand and grasp the requirements of computer networks A 3 - to understand and grasp the types of computer networks and application A 4 - the study of the devices used in computer networks A 5 - to build computer networks A 6 - to understand the problems and obstacles for the application of computer networks B. Subject-specific skills B 1 - Understanding Computer Networks B 2 - application of computer networks B3 -Preparing Design to any computer network requires B4 - solve any problem facing the user in Computer Networking
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (4 hrs.) • Working with Cisco Packet Tracer (48 hrs.)
Description	Network-Centric World, Introduction, Communicating in a Network-Centric World, The Network as a Platform, The Architecture of the Internet, Trends in Networking. Communicating over the Network. Application Layer Functionality and Protocols. OSI Transport Layer. OSI Network Layer. Addressing the Network. OSI Data Link Layer. OSI Physical Layer. Ethernet. Planning and Cabling Networks. Configuring Cisco Devices, IOS Basics, applying a Basic Configuration Using Cisco IOS, Verifying Connectivity, Monitoring and Documenting Networks. Practical part: Network hardware, Type of Communication Channels and Media, LAN, WAN, DSN, Subnet, TCP/IP Protocol, OSI Protocol, PDU, Servers, Wireless Router, Switch, Cloud.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم



Strategies	In this course, students are guided by:
	• Using different examples.
	• Using different styles of discussion that aim to connect the theoretical and practical sides.
	• Asking questions and giving exercises that require analysis and conclusions related to lectures.
	• Encourage students to participate in discussions and do the practical work.
	• Encourage students to work in groups.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	12	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	0.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview of data communication, Networking, their basic components and applications
Week 2	Type of Networking Devices



Week 3	Computer Networks and the Internet
Week 4	Data Communication and Network Hardware
Week 5	Network Topology
Week 6	Reference Models (OSI)
Week 7	The TCP/IP Reference Model and Addressing
Week 8	Data and signal
Week 9	PERFORMANCE ,Bandwidth ,Throughput ,Latency (Delay) ,Bandwidth-Delay Product And Jitter
Week 10	Transmission Media (GUIDED & UNGUIDED)
Week 11	The Network Layer in the Internet
Week 12	IP Addresses, IP Version 6
Week 13	Wired LANs: Ethernet
Week 14	Encoding and Decoding
Week 15	Communication Security
Week 16	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to the lab and get started with use packet tracer simulator
Weeks 2-3	General view of packet tracer simulator tools (cisco), Identify all the icons used, Learn about the different types of connections copper, console, fiber and cross
Weeks 3-4	Recognition End devices, Choose the connection type fast internet, choose ICMP ONLY, Auto capture/ play, inter to router, connect devices to fast Ethernet, distribute IP
Weeks 4-5-6	Subnet mask, Gate away
Weeks 7-8-9-10-11-12-13-14	Experiments
Week 15	Exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Behrouz A Forouzan, Data communications and networking, 4th ed. 2007. A. S Tanenbaum, Computer Network, 2001.	Yes



	- F, Halsall, Multimedia Communications, 2005. - Computer Networks, a System approach, 4th Edition, by Larry Peterson, MK 2007 - TCP/IP Protocol Suite, 4rd edition, by B. A. Forouzan, McGraw Hill 2010	
Recommended Texts	- Andrew S. Tanenbaum, David J. Wetherall, Computer Networks, 5th ed, 2011 - Larry L. Peterson & Bruce S. Davie, Computer Networks A Systems Approach, First edition, 2003	No
Websites	https://csc-knu.github.io/sys-prog/books/Andrew%20S.%20Tanenbaum%20-%20Computer%20Networks.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

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.

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Control Theory		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	COM 306		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGIII	Semester of Delivery	1
Administering Department	Communications engineering	College	College of Engineering
Module Leader	م.د. عبدالوهاب عيسى	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	30-8-2025	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 Objectives أهداف المادة الدراسية	1- During the academic year, the student will learn about the types of systems, whether open or feedback-enabled. 2- Learn and understand the block diagram and its abbreviation. 3- Learn and understand the review of the time- response 4- Learn and understand the foundations of stability.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Familiarity with the mathematical relationships included in the subject. 2. Familiarity with the definition of systems of all types. 3. Familiarity with how to conduct practical experiments related to the subject. 4. Familiarity with the basic concepts of stability methods, their types, and their practical applications.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (2 hrs) • Working with Power point (4 hrs) • Theoretical lectures (20 hrs) • Examinations (4 hrs)
Description	Introduction to Control Systems: History and basic definition of open loop system and closed loop control system. Transfer function: Transfer function of electrical and mechanical system. Block diagram: Block diagram reduction, Signal flow graph and Mason rule. Time response: Typical test signals, poles, zeros, types of system (second order and first order) and steady state error. Stability: Routh-hwtriz criterion, root locus. Frequency response techniques: Bode plots, Nyquist diagram, phase margin and gain margin. PID controller

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	In this course, students are guided by: • Using different examples. • Using different styles of discussion that aim to connect the theoretical and practical sides.
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- Asking questions and giving exercises that require analysis and conclusions related to lectures.
- Encourage students to participate in discussions and do the practical work.
- Encourage students to work in groups.

Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	42	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.8
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	2	10% (5)	6 and 12	LO #1 to #3 and #4 to #6
	Assignments	2	10% (5)	2 and 13	LO #3 to #6
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #3, #4 and #6
Summative assessment	Midterm Exam	2hr	10% (10)	9	LO #1 - #5
	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 Control Systems: History and basic definition of open loop system and closed loop control
Week 2	Transfer function: Transfer function of electrical and mechanical system
Week 3	Transfer function: Transfer function of electrical and mechanical system
Week 4	Block diagram: Block diagram reduction,



Week 5	Signal flow graph and Mason rule.
Week 6	Time response: Typical test signals, poles, zeros,
Week 7	types of system (second order and first order) and steady state error.
Week 8	Stability: Routh-hwtriz criterion,
Week 9	root locus stability
Week 10	root locus stability
Week 11	Frequency response techniques: Bode plots,
Week 12	Frequency response techniques: Bode plots,
Week 13	Nyquist diagram, phase margin and gain margin.
Week 14	PID controller
Week 15	PID controller

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Katsuhiko Ogata, 2003, Modern Control Engineering fifth Edition, Prentice Hall. - Farid Golnaraghi & Benjamin C. Kuo, 2010, Automatic Control Systems, Tenth Edition, Wiley	Yes
Recommended Texts	Norman S. Nise, 2010, Control Systems Engineering, sixth Edition, Wiley.	No
Websites	Microsoft Help, https://support.microsoft.com/en-us/products Learn Microsoft Office, https://www.goskills.com/Microsoft-Office	

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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الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information				
معلومات المادة الدراسية				
Module Title	Digital Communication I		Module Delivery	
Module Type	Core	☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar		
Module Code	COE 302			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	UGIII			Semester of Delivery
Administering Department	Communications Engineering	College	College of Engineering	
Module Leader	م.م. علاء ابراهيم حسين		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification		
Module Tutor	Name (if available)		e-mail	
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	30-8-2025	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 Objectives أهداف المادة الدراسية	69. Introduce the basic concepts and mathematical foundations of digital communication systems. 70. Impart knowledge on pulse modulation techniques (PAM, PCM, DM, ADM) and their applications. 71. Impart knowledge on digital modulation schemes (ASK, PSK, FSK, QPSK, QAM, M-ary) and performance in AWGN channels. 72. Impart knowledge on multiplexing techniques (TDM, FDM) and their role in digital communication.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate knowledge and understanding of the fundamental concepts of digital communication, including pulse modulation and digital modulation schemes, with performance evaluation in noisy channels. 2. Understand system design and use integrated approaches to analyze and solve problems in digital communication systems. 3. Demonstrate achievement of subject knowledge through theoretical analysis, laboratory work, and seminars. 4. Solve additional, more challenging problems related to digital modulation, multiplexing, and error performance. 5. Identify appropriate design challenges in digital communication and formulate clear objectives using analytical methods and simulation tools.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (2 hrs) • Working with tutorial (15 hrs) • Theoretical lectures (30 hrs) • Lap (32 hrs)
Description	Fundamental Concepts: Basic elements of digital communication systems, communication channels, signal representation. Pulse Modulation Techniques: PAM, PWM, PPM, PCM, DPCM, DM, ADM; noise in pulse modulation systems. Digital Modulation Techniques: ASK, PSK, FSK, QPSK, DPSK, DEPSK, MSK, M-ary FSK, M-ary PSK, QAM, M-ary QAM. Optimum Receivers for AWGN Channels: Receiver design for signals corrupted by AWGN, performance of modulation schemes, trade-off among power, bandwidth, data rate, and error probability. Multiplexing Techniques: Time Division Multiplexing (TDM), Frequency Division

Multiplexing (FDM), applications in digital communication. Laboratory Work: Representation of digital signals, implementation of pulse modulation schemes, M-PSK modem, M-FSK modem, QAM modem, TDM and FDM experiments.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

In this course, students are guided by:

- Using illustrative examples to explain pulse and digital modulation techniques.
- Applying problem-solving sessions that link theory with practical experiments.
- Encouraging discussions to analyze system performance under noise and bandwidth constraints.
- Integrating simulation tools (e.g., MATLAB/Simulink) to support understanding of digital communication concepts.
- Laboratory experiments to strengthen the connection between theoretical principles and real-world applications.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

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



assessment	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction: Elements of digital communication systems, communication channels.
Week 2	Pulse Modulation Techniques: PAM, PWM, PPM – principles and applications.
Week 3	Pulse Code Modulation (PCM), Differential PCM (DPCM), Delta Modulation (DM).
Week 4	Adaptive Delta Modulation (ADM) and noise in pulse modulation systems.
Week 5	Digital Modulation: Amplitude Shift Keying (ASK), Phase Shift Keying (PSK).
Week 6	Frequency Shift Keying (FSK), Quadrature PSK (QPSK).
Week 7	Differential PSK (DPSK), Differential Encoded PSK (DEPSK), Minimum Shift Keying (MSK).
Week 8	M-ary Modulation: M-ary FSK, M-ary PSK.
Week 9	Quadrature Amplitude Modulation (QAM), M-ary QAM.
Week 10	Optimum receivers for AWGN channel – receiver design principles.
Week 11	Performance of modulation schemes in AWGN channels.
Week 12	Trade-offs in digital communication: power, bandwidth, data rate, and error probability.
Week 13	Multiplexing Techniques: Time Division Multiplexing (TDM).
Week 14	Multiplexing Techniques: Frequency Division Multiplexing (FDM).
Week 15	Applications of TDM and FDM in digital communication systems – case studies and review.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Representation of digital signals (time and frequency domain).
Week 2	Pulse Amplitude Modulation (PAM) experiment.
Week 3	Pulse Code Modulation (PCM) and Delta Modulation (DM).
Week 4	Adaptive Delta Modulation (ADM) with noise effects.
Week 5	ASK Modulation and Demodulation.
Week 6	PSK Modulation and Demodulation.
Week 7	FSK Modulation and Demodulation.
Week 8	QPSK Modulation and Performance Measurement.
Week 9	M-PSK Modem experiment.



Week 10	M-FSK Modem experiment.
Week 11	QAM Modulation and Demodulation.
Week 12	M-ary QAM Modem experiment.
Week 13	TDM Implementation experiment.
Week 14	FDM Implementation experiment.
Week 15	Integrated case study: performance analysis of modulation and multiplexing techniques.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	<i>Principles of Communication</i>, Sanjay Sharma, S.K. Kataria & Sons, New Delhi	Yes
Recommended Texts	J. G. Proakis & M. Salehi, <i>Digital Communications</i>, McGraw-Hill. - Simon Haykin, <i>Communication Systems</i>, Wiley. - Bernard Sklar, <i>Digital Communications: Fundamentals and Applications</i>, Prentice Hall. B. P. Lathi & Zhi Ding, <i>Modern Digital and Analog Communication Systems</i>, Oxford University Press.	No
Websites	- MIT OpenCourseWare – <i>Digital Communication</i>: https://ocw.mit.edu - IEEE Xplore Digital Library: https://ieeexplore.ieee.org	

Grading Scheme

مخطط الدرجات

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

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

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Digital Signal Processing		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 301		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII	Semester of Delivery	
Administering Department	Communications Engineering	College	College of Engineering
Module Leader	م.م. علاء ابراهيم حسين	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	30-8-2025	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 Objectives	73. The student's ability to understanding signals and systems Introduce the basics of signals (continuous-time and discrete-time) and systems (linear		



	time-invariant systems), including concepts like convolution and frequency domain representation. 74. Explain the process of converting continuous signals into discrete signals through sampling and the effects of quantization. 75. Being able to analysis the time and frequency Domain and Develop skills in analyzing signals and systems in both time domain (using difference equations, impulse response, etc) and frequency domain (Fourier series, Fourier transform, Z-transform). 76. And also the student's ability to know digital signal processing algorithms and study common algorithms used in DSP such as the Fast Fourier Transform (FFT). 77. Being able to design and Analysis Filter: cover the design and analysis of digital filters including FIR (Finite Impulse Response) filter and IIR (Infinite Impulse Response) filters, using techniques like windowing and bilinear method. 78. Building and preparing the student psychologically to play his role as a reliable engineer in this field. 79. Building students capable of competing with other engineers for job opportunities and obtaining the required seats to complete postgraduate studies. 80. Ability to submit to external tests by local, regional or international bodies for the purpose of completing studies or appointment. 81. Providing students with scientific, practical and personal skills that enable them to solve practical problems and deal with them using scientific concepts.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	59. Understanding and teaching the student the types of signs 60. Enabling the student to know the types of systems. 61. The student will understand the types of filters in communications systems. 62. Enabling students to know how to process a signal. 63. The student will understand the types of communications networks through which information is exchanged. 64. Enabling the student to visualize project management and solve the



	problems he encounters in the factory.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (4 hrs) • Working with Power point (15 hrs) • Theoretical lectures (30 hrs) • Lap (30hrs)
Description	Introduce the basics of signals (continuous-time and discrete-time) and systems (linear time-invariant systems), including concepts like convolution and frequency domain representation. Analog to Digital (A/D) and Digital to Analog (D/A) Conversion. Discrete Fourier Transform: Discrete Fourier Transform (DFT), Inverse discrete Fourier transform (IDFT), Relationship between Fourier transform and Fourier series. Fast Fourier Transform (FFT): Definition, Applications, Decimation in time FFT (DIF-FFT), Decimation in Frequency FFT (DIF-FFT). Z-transform: Introduction to the Z-transform, Inverse Z-transforms, Properties of Z-transforms, Transfer Functions. Digital Filter Design: Discrete Time Filters, Design by using numerical solution, bilinear transformation, Design IIR filter using bilinear method, Analog Design using digital filter, Digital Design using digital to digital transformation, Design of finite impulse response filter (FIR), Design of FIR using windows methods, FIR design computer techniques. Realization of Digital Filters. Introduction to Statistical Signal Processing: Signal Models: types and properties of statistical models for signals. Analog Filter Design: Butterworth filter and Chebyshev filter.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	In this course, students are guided by: • Using different examples. • Using different styles of discussion that aim to connect the
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	theoretical and practical sides. - Asking questions and giving exercises that require analysis and conclusions related to lectures. - Encourage students to participate in discussions and do the practical work. - Encourage students to work in groups.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	47	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
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Week 1	Introduce the basics of signals (continuous-time and discrete-time) and systems (linear time-invariant systems)
Week 2	Convolution and frequency domain representation.
Week 3	Sampling and A/D conversion
Week 4	Introduction to the Z-transform and Properties of Z-transforms
Week 5	Inverse Z-transforms Properties of Z-transforms
Week 6	Inverse Discrete Fourier Transform (IDFT) and Discrete Fourier Transform (DFT)
Week 7	Fast Fourier Transform (FFT): Definition, Applications, Decimation in Frequency FFT (DIF-FFT).
Week 8	Decimation in time FFT (DIF-FFT)
Week 9	Digital Filter Design: Discrete Time Filters, Design by using numerical solution, bilinear transformation
Week 10	Digital Design using digital to digital transformation, Design of finite impulse response filter (FIR)
Week 11	Design of FIR using windows methods
Week 12	Realization of Digital Filters.
Week 13	Analog filter design.
Week 14	Butterworth and Chebyshev filter
Week 15	PowerPoint: Prepare to deliver your presentation
Week 16	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to the lab and get started with use of tools which uses in the experiments.
Week 2	Introduction to the MATLAB program and how to use it.
Week 3	An overview of the experiments that will be carried out in the laboratory and using some of the available programs.
Week 4	Unit impulse signal: programming the generation of this signal in the laboratory
Week 5	Unit step signal: programming the generation of this signal in the laboratory
Week 6	Unit ramp signal: programming the generation of this signal in the laboratory
Week 7	Exponential growing signal: programming the generation of this signal in the laboratory
Week 8	Exponential decaying signal: programming the generation of this signal in the



	laboratory
Week 9	Sine signa: programming the generation of this signal in the laboratory
Week 10	Cosine signal: programming the generation of this signal in the laboratory
Week 11	Sum of sinusoidal signals: programming the generation of this signal in the laboratory
Week 12	Sampling and Quantization: programming the process of sampling and quantization in the laboratory
Week 13	Programming DFT and IDFT
Week 14	Review and discussion
Week 15	Preparatory week before the final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	John G. Prokais, digital signal processing	Yes
Recommended Texts	Digital Signal Processing, Li Tan 2008	No
Websites	None	

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.

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Engineering Analyses		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COM 305		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGIII	Semester of Delivery	
Administering Department	Communications Engineering	College	College of Engineering
Module Leader	د. حامد هاشم الزويني	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	30-8-2025	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 Objectives أهداف المادة الدراسية	1. Familiarity with mathematical relationships and converting them to matrices. 2. Familiarity with basic concepts, as well as continuous and discrete mathematical relationships. 3. Familiarity with relationships specific to numerical matrices and how to calculate		

	them. 4. Familiarity with complex variables and methods of calculating differential equations.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate the knowledge and understanding of the fundamental concepts, principles and theories of matrices 2. Understand process of electrical circuit and use integrated and solve complex problems by using matrices 3. Demonstrate achievement of a subject numerical analysis. 4. Solving special functions.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (2 hrs) • Working with tutorial (23 hrs) • Theoretical lectures (60 hrs) • Examinations (5 hrs)
Description	Matrix analysis, Singular and non-singular matrices, Rank of a matrix, Elementary operations and equivalent matrices, Consistency of a set of equations, Uniqueness of solutions of sets of equations, Inverse method, Row transformation method, Gaussian elimination method, triangular decomposition method, Comparison of methods. Eigenvalues and eigenvectors, Cayley-Hamilton theorem, Diagonalization of a matrix, Systems of second-order differential equations, Matrix transformation, Rotation of axes, application of matrices to electric cct. Interpolation: Polynomials, Curve Fitting, and Interpolation, Modeling, Computers, and Error Analysis. Roots of Equations: Bracketing Methods: Graphical Methods, The Bisection Method, The False-Position Method, Incremental Searches and Determining Initial Guesses; Open Methods: Simple Fixed-Point Iteration, The Newton-Raphson Method, The Secant Method, Multiple Roots, Systems of Nonlinear Equations. Roots of Polynomials: polynomials in Engineering and Science,, Conventional Methods, Müller's Method, Bairstow's Method. Naïve Gauss Elimination, Pitfalls of Elimination Methods, Nonlinear Systems of Equations, Gauss-Jordan; LU Decomposition and Matrix Inversion: LU Decomposition, Solution of Differential Equation by Power Series: Legendre's equation, Legendre's polynomials, Bessel function of the first kind and its solution
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	In this course, students are guided by: • Using different examples. • Using different styles of discussion that aim to connect the theoretical and practical sides. • Asking questions and giving exercises that require analysis and conclusions related to lectures. • Encourage students to participate in discussions and do the practical work. • Encourage students to work in groups.

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	32	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.1
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% (5)	6 and 12	LO #1 to #3 and #4 to #6
	Assignments	2	10% (5)	2 and 13	LO #3 to #6
	Projects	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #3, #4 and #6
Summative assessment	Midterm Exam	2hr	10% (10)	9	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

	Material Covered
Week 1	Matrix analysis, Singular and non-singular matrices with (2 hrs) tutorial
Week 2	Rank of a matrix, Elementary operations and equivalent matrices, Consistency of a set of equations, Uniqueness of solutions of sets of equations (2 hrs) tutorial
Week 3	Inverse method, Row transformation method, Gaussian elimination method (2 hrs) tutorial
Week 4	Triangular decomposition method, Comparison of methods. (2 hrs) tutorial
Week 5	Eigenvalues and eigenvectors, Cayley-Hamilton theorem, (2 hrs) tutorial
Week 6	Diagonalization of a matrix, Systems of second-order differential equations, Matrix transformation, Rotation of axes, application of matrices to electric cct. (2 hrs) tutorial
Week 7	Interpolation: Polynomials, Curve Fitting, and Interpolation (2 hrs) tutorial
Week 8	Modeling, Computers, and Error Analysis. Roots of Equations: Bracketing Methods: Graphical Methods, The Bisection Method, (2 hrs) tutorial
Week 9	The False-Position Method, Incremental Searches and Determining Initial Guesses; Open Methods:



	Simple Fixed-Point Iteration (2 hrs) tutorial
Week 10	The Newton-Raphson Method, The Secant Method, Multiple Roots, Systems of Nonlinear Equations. Roots of Polynomials: polynomials in Engineering and Science, (2 hrs) tutorial
Week 11	Conventional Methods, Müller's Method, Bairstow's Method. ;, (2 hrs) tutorial
Week 12	Naïve Gauss Elimination, Pitfalls of Elimination Methods, Nonlinear Systems of Equations, Gauss-Jordan; LU Decomposition and Matrix Inversion: LU Decomposition, (2 hrs) tutorial
Week 13	Solution of Differential Equation by Power Series: Legendre's equation (2 hrs) tutorial
Week 14	Legendre's polynomials (2 hrs) tutorial
Week 15	Bessel function of the first kind and its solution. (2 hrs) tutorial

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Advanced Engineering Mathematics, 3rd edition, by C. R. Wylie	Yes
Recommended Texts	- Mathematics for Engineers and Applied Scientists, 2nd edition, by Stanley. - Introductory Digital Signal Processing, 2nd edition by P. A. Lynn.	No
Websites	Microsoft Help, https://support.microsoft.com/en-us/products Learn Microsoft Office, https://www.goskills.com/Microsoft-Office	

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.

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Laser Principles		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 307		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGIII	Semester of Delivery	
Administering Department	Communications Engineering	College	College of Engineering
Module Leader	أ.د. قيس شريف مجدي	e-mail	suha_alnassar_eng@uodiyala.edu.iq
Module Leader's Acad. Title	Prof. Dr.	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	30-8-2025	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 Objectives	82. Introduce the basic mathematical concepts related to laser theory.		

أهداف المادة الدراسية	83. Impart knowledge on the concepts of laser theory and design. 84. Impart knowledge on the concepts of laser system. 85. Impart knowledge on the concepts of types of lasers.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course is intended for teaching the basic principle of laser system for engineering students at the beginning graduate level. The course will have these important outcomes: 1. Understanding Energy Levels and Atomic Structure 2. Demonstrate the knowledge and understanding of the fundamental concepts, principles and theories underpinning laser system design and Electromagnetic Spectrum, in addition to principles of natural of light and the interaction between the radiations with matter. 3. Understand the Principle of Laser and use integrated approaches to solve complex problems. 4. Demonstrate achievement of a subject knowledge, particularly via seminars. 5. Solving additional, more challenging exam problems 6. Identify appropriate design and governance problems and formulate clear objectives using mathematical equations
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (4 hrs) • Working with Power point (11 hrs) • Theoretical lectures (15 hrs)
Description	- Fundamental Concepts: - Nature of Light: Wave Theory, Electromagnetic Spectrum, Energy-mass relation, Momentum of photon. Mass of photon. – Matter: Structure of Atoms & Molecules. Energy Levels, Electronic, Vibrational and Rotational Energy Levels, Interaction of Radiation with Matter: Absorption, Spontaneous Emission, Stimulated Emission, Einstein's A & B Coefficients of Transitions, Maxwell-Boltzmann Distribution, Planck's law of blackbody radiation, Principle of Laser action: Population inversion, metastable states, gain medium, Pumping mechanisms, feedback mechanism, threshold condition for laser beam generation., Optical Resonators: Types of Resonators, Stability Criteria, g-parameters., Characteristics of Laser Beams: Monochromaticity, Directionality, Brightness, Coherence: temporal & spatial, Focus ability, Ultra-short pulse generation. - Longitudinal & Transverse Modes : Temporal modes, Spatial Modes & characteristics, Types of Lasers: Three- level and Four-level Lasers, Solid, Liquid and Gas Lasers. Brief description of Ruby, He-Ne, Nd:YAG, Carbon Dioxide Lasers, Semiconductor Lasers. X-Ray Lasers, Free-electron Lasers. Fiber Lasers.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

In this course, students are guided by:

- Using different examples.
- Using different styles of discussion that aim to connect the theoretical and practical sides.
- Asking questions and giving exercises that require analysis and conclusions related to lectures.
- Encourage students to participate in discussions and do the practical work.
- Encourage students to work in groups.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	33	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	42	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	2.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

		Time/Num ber	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (5)	6 and 12	LO #1 to #3 , #4 to #6
	Assignments	2	10% (5)	2 and 13	LO #3 to #6
	Projects / Lab.				
	Report	1	10% (10)	13	LO #3, #4 and #6
Summative assessment	Midterm Exam	1hr	10% (10)	9	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري



	Material Covered
Week 1	- Review of Nature of Light, Wave Theory, Electromagnetic Spectrum, Energy-mass relation, Momentum of photon. Mass of photon
Week 2	Fundamental parameters of Matter, Structure of Atoms & Molecules. Energy Levels, Electronic, Vibrational and Rotational Energy Levels with Examples. Two-level representation
Week 3	Interaction of Radiation with Matter, Absorption, Spontaneous Emission, Stimulated Emission, Einstein's A & B Coefficients of Transitions
Week 4	Maxwell-Boltzmann Distribution, Planck's law of blackbody radiation.
Week 5	Principle of Laser action: Population inversion, metastable states, gain medium,
Week 6	Pumping mechanisms, feedback mechanism, threshold condition for laser beam generation.
Week 7	Overview of Optical Resonators, Types of Resonators,
Week 8	Stability Criteria, g-parameters.
Week 9	Characteristics of Laser Beams: Monochromaticity, Directionality, Brightness, Coherence:
Week 10	Types of coherent: temporal & spatial, Focus ability, Ultra-short pulse generation.
Week 11	Longitudinal & Transverse Modes : Temporal modes, Spatial Modes & characteristics
Week 12	Design procedure of Arrays Antennas
Week 13	Types of Lasers: Three- level and Four-level Lasers, Solid, Liquid and Gas Lasers. X-Ray Lasers,
Week 14	Brief description of Ruby, He-Ne, Nd:YAG, Carbon Dioxide Lasers, Semiconductor Lasers.
Week 15	Free-electron Lasers. Fiber Lasers.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• Laser Principles, Types & Applications: K R Nambiar, New Age International, 2004.	No
Recommended Texts	• Lasers: Theory and Applications : A K Ghatak and K Thyagarajan, McMillan, 2003	No
Websites	None	

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.

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Cyber security		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 311		
ECTS Credits	3		
SWL (hr/sem)	75		
Module Level	UGIII	Semester of Delivery	
Administering Department	Communications Engineering	College	College of Engineering
Module Leader	م.د. محمود عارف الشريدة	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	30-8-2025	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 Objectives أهداف المادة الدراسية	86. Introduce students to the foundational concepts, principles, and terminology of cybersecurity. This includes understanding the importance of protecting information and systems, the evolving threat landscape, and the role of cybersecurity in modern society. 87. Familiarize students with various security policies, standards, and best practices that are relevant to the field of cybersecurity. This includes understanding legal and regulatory requirements, industry frameworks, and international standards related to information security. 88. Explore the principles and techniques of securing computer networks against unauthorized access, attacks, and data breaches. 89. Provide students with knowledge of secure software development practices and methodologies. This involves understanding common software vulnerabilities, secure coding techniques, secure software development lifecycle, and the importance of testing and vulnerability assessments. 90. Introduce students to the fundamentals of incident response and digital forensics. This includes learning how to detect, respond, and recover from cybersecurity incidents, as well as conducting digital investigations and preserving evidence in a legally admissible manner.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Gain a comprehensive understanding of the fundamental concepts, principles, and terminology related to cybersecurity, including the importance of protecting information and systems, the evolving threat landscape, and the role of cybersecurity in society. 2. Demonstrate knowledge and comprehension of various security policies, standards, and best practices relevant to cybersecurity, including legal and regulatory requirements, industry frameworks, and international standards related to information security. 3. Apply secure software development practices and methodologies, including understanding common software vulnerabilities, secure coding techniques, secure software development lifecycle, and the importance of testing and vulnerability assessments.

	4. Apply skills in identifying, assessing, and managing cybersecurity risks, including understanding risk assessment methodologies, threat modeling, risk mitigation strategies, and business continuity planning. 5. Understand and apply ethical and legal considerations associated with cybersecurity, including privacy laws, intellectual property rights, ethical hacking, professional ethics, and the responsibilities of cybersecurity professionals. 6. Demonstrate awareness and understanding of emerging technologies and trends in cybersecurity, including cloud security, Internet of Things (IoT) security, artificial intelligence (AI) and machine learning in cybersecurity, and securing mobile and wireless networks.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Module 1: Introduction to cybersecurity. [12 hrs] • Module 2: Attacks, concepts and techniques. [12 hrs] • Module 3: Protecting your Data and Privacy. [12 hrs] • Module 4: Protecting the organization. [12 hrs] • Module 5: Legal and Ethical Issues. [12 hrs]
Description	The main strategy that will be adopted in delivering this module is to learn the concept of cyber security and 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 types of simple experiments involving some sampling activities that are interesting to the students.

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.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	12	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	0.8



Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75
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Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Introduction - World of cybersecurity
Week 2	Organizational Data
Week 3	Cyber Attackers
Week 4	Cyberwarfare
Week 5	Module 2: Attacks, concepts and techniques: Analyzing a Cyber Attack
Week 6	Methods of Infiltration
Week 7	Security Vulnerability and Exploits
Week 8	Module 3: Protecting Your Data and Privacy: Protecting Your Devices and Network
Week 9	Data Maintenance
Week 10	Safeguarding Your Online Privacy.
Week 11	Module 4: Protecting the organization: Cybersecurity Devices and Technologies
Week 12	Behavior Approach to Cybersecurity
Week 13	Module 5: Legal and Ethical Issues: Legal Issues in Cybersecurity
Week 14	Security Operations & Incident Management



Week 15 Operating Systems and Virtualization

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Study of steps to protect your personal computer system by creating User Accounts with Passwords and types of User Accounts for safety and security
Week 2	Study the steps to protect a Microsoft Word Document of different version with different operating system.
Week 3	Study the steps to remove Passwords from Microsoft Word
Week 4	Study various methods of protecting and securing databases
Week 5	Study “How to make strong passwords” and “passwords cracking techniques”
Week 6	Study the steps to hack a strong password.
Week 7	Perform encryption, decryption using the following substitution techniques (i) Ceaser cipher (ii) playfair cipher (iii) Hill Cipher (iv) Vigenere cipher
Week 8	Perform encryption and decryption using following transposition techniques (i) Rail fence (ii) row & Column Transformation
Week 9	Apply DES algorithm for practical applications
Week 10	Apply AES algorithm for practical applications.
Week 11	Implement the Diffie-Hellman Key Exchange algorithm for a given problem
Week 12	Implement the Diffie-Hellman Key Exchange algorithm for a given problem
Week 13	Calculate the message digest of a text using the SHA-1 algorithm.
Week 14	Implement the SIGNATURE SCHEME – Digital Signature Standard
Week 15	Automated Attack and Penetration Tools Exploring N-Stalker, a Vulnerability Assessment Tool

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Eric Conrad , Seth Misenar, Joshua Feldman, CISSP® Study Guide , Fourth Edition, 2023 Elsevier Inc.	No
Recommended Texts	- George K. Kostopoulos, “CYBERSPACE and CYBERSECURITY,” © 2013 by Taylor & Francis Group, LLC. - James Graham, Richard Howard and Ryan Olson, “Essential Cybersecurity Science,” © 2016 O’Reilly Media, Inc.	yes
Websites	None	

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.

الملحق 4: وصف المادة الدراسية MODULE DESCRIPTION FORM نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Digital Communication II		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 309		
ECTS Credits	5		
SWL (hr/sem)	150		
Module Level	UGIII	Semester of Delivery	
Administering Department	Communications Engineering	College	College of Engineering
Module Leader	م.م. علاء ابراهيم حسين	e-mail	
Module Leader's Acad. Title	Assoc. Prof. Dr	Module Leader's Qualification	PhD in



				Communication Engineering
Module Tutor	Name (if available)	e-mail		
Peer Reviewer Name	Name	e-mail	E-mail	
Scientific Committee Approval Date	30-8-2025	Version Number	1.0	

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Digital Communication I	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	91. Understand and model fading multipath channels and their impact on digital communication. 92. Study and apply diversity techniques and error control coding (e.g., convolutional, TCM). 93. Analyze binary/M-ary signaling and spread spectrum systems (DS, FH, CDMA) with Rake receivers. 94. Explore multiple access techniques (TDMA, FDMA, CDMA, SDMA) and system capacity. 95. Evaluate path loss, shadowing, and channel capacity in AWGN and fading environments.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	6. Describe and analyze fading channels and their statistical models. 7. Apply diversity and coding techniques to improve system performance. 8. Design and evaluate spread spectrum and multi-access systems (e.g., CDMA, TDMA, FDMA). 9. Use simulation tools to model channel behavior and assess error performance. 10. Evaluate system capacity in AWGN and fading environments with/without channel state information.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (2 hrs) • Working with tutorial (15 hrs) • Theoretical lectures (30 hrs)

	• Lap (32 hrs)
Description	This course provides an advanced treatment of digital communication systems in practical wireless environments. It covers the characterization of multipath fading channels , statistical models, and their impact on system performance. Students will study binary and M-ary signaling schemes , diversity techniques , and error control coding such as convolutional and trellis coded modulation. The course also introduces spread spectrum systems (DS, FH, CDMA), multiple access techniques (TDMA, FDMA, CDMA, SDMA), and the concepts of path loss , shadowing , and channel capacity in AWGN and fading channels. Laboratory sessions and simulation exercises using tools like MATLAB are integrated to strengthen both theoretical knowledge and practical skills.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Lectures: Provide theoretical foundations and mathematical modeling of fading channels, coding, and modulation schemes. Tutorials/Problem-Solving Sessions: Reinforce concepts through exercises, analytical derivations, and case studies. Laboratory Work: Hands-on experiments and simulations (e.g., MATLAB/Simulink) to demonstrate digital communication techniques and channel effects. Assignments/Projects: Individual and group tasks focusing on simulation, coding, and performance evaluation of digital systems. Seminars/Presentations: Encourage critical discussion and deeper understanding of advanced topics such as spread spectrum and multi-access systems.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Num ber	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative	Quizzes	2	10% (5)	6 and 12	LO #1 to #3 and #4 to #6



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

Delivery Plan (Weekly Syllabus)

المناهج الاسبوعي النظري

	Material Covered
Week 1	Introduction: Elements of digital communication systems, communication channels.
Week 2	Pulse Modulation Techniques: PAM, PWM, PPM – principles and applications.
Week 3	Pulse Code Modulation (PCM), Differential PCM (DPCM), Delta Modulation (DM).
Week 4	Adaptive Delta Modulation (ADM) and noise in pulse modulation systems.
Week 5	Digital Modulation: Amplitude Shift Keying (ASK), Phase Shift Keying (PSK).
Week 6	Frequency Shift Keying (FSK), Quadrature PSK (QPSK).
Week 7	Differential PSK (DPSK), Differential Encoded PSK (DEPSK), Minimum Shift Keying (MSK).
Week 8	M-ary Modulation: M-ary FSK, M-ary PSK.
Week 9	Quadrature Amplitude Modulation (QAM), M-ary QAM.
Week 10	Optimum receivers for AWGN channel – receiver design principles.
Week 11	Performance of modulation schemes in AWGN channels.
Week 12	Trade-offs in digital communication: power, bandwidth, data rate, and error probability.
Week 13	Multiplexing Techniques: Time Division Multiplexing (TDM).
Week 14	Multiplexing Techniques: Frequency Division Multiplexing (FDM).
Week 15	Applications of TDM and FDM in digital communication systems – case studies and review.

Delivery Plan (Weekly Lab. Syllabus)

المناهج الاسبوعي للمختبر

	Material Covered
Week 1	Representation of digital signals (time and frequency domain).
Week 2	Pulse Amplitude Modulation (PAM) experiment.
Week 3	Pulse Code Modulation (PCM) and Delta Modulation (DM).
Week 4	Adaptive Delta Modulation (ADM) with noise effects.



Week 5	ASK Modulation and Demodulation.
Week 6	PSK Modulation and Demodulation.
Week 7	FSK Modulation and Demodulation.
Week 8	QPSK Modulation and Performance Measurement.
Week 9	M-PSK Modem experiment.
Week 10	M-FSK Modem experiment.
Week 11	QAM Modulation and Demodulation.
Week 12	M-ary QAM Modem experiment.
Week 13	TDM Implementation experiment.
Week 14	FDM Implementation experiment.
Week 15	Integrated case study: performance analysis of modulation and multiplexing techniques.

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Principles of Communication, Sanjay Sharma, S.K. Kataria & Sons, New Delhi. J. G. Proakis & M. Salehi, Digital Communications, McGraw-Hill.	yes
Recommended Texts	- Simon Haykin, Communication Systems, Wiley. - Bernard Sklar, Digital Communications: Fundamentals and Applications, Prentice Hall. B. P. Lathi & Zhi Ding, Modern Digital and Analog Communication Systems, Oxford University Press.	No
Websites	- MIT OpenCourseWare – Digital Communication: https://ocw.mit.edu - IEEE Xplore Digital Library: https://ieeexplore.ieee.org	

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings



	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

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

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Digital Image Processing		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 308		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	UGIII	Semester of Delivery	
Administering Department	Communications Engineering	College	College of Engineering
Module Leader	م.د. مرتجي علي ساري	e-mail	
Module Leader's Acad. Title	Associate Professor	Module Leader's Qualification	PhD in Comm. Eng.
Module Tutor		e-mail	
Peer Reviewer Name	Name	e-mail	hussein_al-khalidi_eng@uodiyala.edu.iq
Scientific Committee Approval Date	30-8-2025	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 Objectives أهداف المادة الدراسية	The course objectives are: 96. 1. Provide the student with the fundamentals of digital image processing 97. 2. Give the students a taste of the applications of the theories taught in the subject. This will be achieved through the project and some selected lab sessions. 98. 3. Introduce the students to some advanced topics in digital image processing. 99. 4. Providing students with a useful skill base and experience that will enable them to continue their studies and work in this field.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	Upon Successfully completing the course, the student should: 1. Have an appreciation of the fundamentals of Digital Image Processing including the topics of filtering, transforms and morphology, and image analysis and compression 2. Be able to implement basic image processing algorithms in MATLAB. 3. Have the skill base necessary to further explore advanced topics of Digital Image Processing. 4. Be in a position to make a positive professional contribution in the field of Digital Image Processing. 5. At the end of the course the student should have a clear impression of the breadth and practical scope of Digital Image Processing and have arrived at a level of understanding that is the foundation for most of the work currently underway in this field.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (2 hrs) • Working with tutorial (15 hrs) • Theoretical lectures (30 hrs) • Lap (28 hrs)
Description	This module introduces the fundamental concepts of digital image processing. The course covers the principles of operations and methods that deal with images and

frames to extract and enhance features. Also, the course will provide an introduction to filtration methods. Basic types of image are studied, including binary images, color images, grayscale images and special types such as x-ray images with emphasis on their characteristics and practical applications in communication systems. All processes will help the student to understand one of the most types of information transmitted.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

In this course, students are guided by:

- Using different examples of images and frames.
- Using different styles of discussion that aim to connect the theoretical and practical sides.
- Asking questions and giving exercises that require analysis and conclusions related to lectures.
- Encourage students to participate in discussions and do the practical work.
- Encourage students to work in groups.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	22	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	1.5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (5)	6 and 12	LO #1 to #3 and #4 to #6
	Assignments	2	10% (5)	2 and 13	LO #3 to #6
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #3, #4 and #6
Summative assessment	Midterm Exam	2hr	10% (10)	9	LO #1 - #5
	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 image processing, definitions, computer imaging, major topics of image processing, The origins of Image processing, digitization, The image types, The fields that used the digital image processing.
Week 2	Digital Image File Format, Multispectral images, Fundamental steps in digital image processing, Components of Image processing system, Image processing techniques, Image Algebra.
Week 3	Image Sampling and Quantization, Spatial and Gray-level Resolution, Effect of reducing the spatial resolution, Effect of reducing the gray-level resolution, Basic relationships between pixels.
Week 4	Intensity Transformation Functions, Histogram Processing, Fundamentals of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters, Combining Spatial Enhancement Methods.
Week 5	
Week 6	Image Compression by Discrete Cosine Transform. A Model of the Image Degradation/Restoration Process, Noise Models, Restoration in the Presence of Noise Only, Minimum Mean Square Error (Wiener) Filtering, Constrained Least Squares Filtering, Geometric Mean Filter.
Week 7	
Week 8	
Week 9	Noise filtering: median, mean, Low pass, Linear Minimum Mean Squared Error (LMMSE), Directional Spatial.
Week 10	
Week 11	Mid exam.
Week 12	Color Models, Color Transformations, Smoothing and Sharpening, Noise in Color Images, Color Image Compression.
Week 13	Fourier Analysis – Shortcomings, Wavelet Transforms, CWT, and DWT, One Dimension (1D) DWT, Multi-Resolution 2D Wavelet Transforms, Different Decomposition Schemes, Statistical Properties of Wavelet subbands and Applications of DWT.
Week 14	
Week 15	

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to MATLAB environment with a summary of MATLAB commands used and apply instructions of reading image, displaying image.
Week 2	Image transformation, information, size, resize, zoom.
Week 3	Image Addition, Subtraction, Multiplication, Division and logical operations.
Week 4	Image Histogram
Week 5	Image Scaling & Rotation
Week 6	Edge detection Algorithm
Week 7	Image Enhancement-Spatial filtering
Week 8	Image segmentation – Edge detection, line detection and point detection.
Week 9	Region based Segmentation



Week 10	Analysis of images with different color models
Week 11	DFT analysis of images.
Week 12	Image restoration
Week 13	Image compression techniques
Week 14	Analysis of spatial and intensity resolution of images
Week 15	Examination

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- Digital Image Processing- Rafeal C. Gonzalez, Richard E. Woods, 3rd Edition, Pearson, 2008. - Digital Image Processing- S Jayaraman, S. Essackirajan, T. Veerakumar-TMH, 2010	Yes
Recommended Texts	- Introduction to Digital Image Processing with Matlab, Alasdair McAndrew, Thomson Course Technology - Digital Image Processing using Matlab, Rafeal C. Gonzalez, Richard E. Woods, Steven L. Eddins, Pearson Education.	No
Websites	None.	

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.

الملحق 4: وصف المادة الدراسية



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Information Theory and Coding		Module Delivery
Module Type	Core		☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	COE 312		
ECTS Credits	5		
SWL (hr/sem)	150		
Module Level	UGIII	Semester of Delivery	
Administering Department	Communications Engineering	College	College of Engineering
Module Leader	م.م. عباس فاضل كاظم	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	Master
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	30-8-2025	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 Objectives	In this course, the student will acquire the following skills: 1. Understand the fundamentals of information theory and channel capacity 2. Understand and explain the principles of coding techniques used in digital communication		
أهداف المادة الدراسية			



	systems 3. Recognize advances in coding theory in next-generation broadband communication systems. 4. Perform independent work in wireless system design with some creative problem-solving ability. 5. Effectively communicate through presentations, technical writing, and research discussion. 6. Appreciate the benefits of teamwork through collaboration with other professionals.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	By the end of the semester, students should be able to: 1. Understand the theoretical and conceptual basis of information theory. 2. Determine the amount of information per symbol and information rate of a discrete memoryless source and design lossless source codes for discrete memoryless sources to improve the efficiency of information transmission. 3. Evaluate the information capacity of discrete memoryless channels determine possible code rates achievable on such channels and apply the Shannon-Hartley theorem for information transmission on Gaussian channels to determine the capacity. 4. Appreciate information-theoretic results as fundamental limits on the performance of communication systems 5. Understand and apply the principles of information theory and can detect and correct errors using the correction theory. 6. Work in groups and function on multi-disciplinary teams. 7. Identify, formulate, and solve engineering-related information theory problems. 8. Use the techniques, skills, and modern engineering tools necessary for engineering practice in telecommunications applications.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course reviewing and introduction (6 hrs) • Source entropy (24 hrs) • The techniques of source coding (12 hrs) • Error control coding (channel coding), detection and correction of error. (28 hrs)
Description	Review the Probability: Joint probability, Conditional Probability, Introduction to information measurement: Information theory, Information source, Self-information. Entropy, Source entropy rate, Mutual information, Types of channels: Discrete memory-less channels: Channel representation, Channel matrix, Special channels: Loss less channel, Noise less channel, Deterministic channel, BCS, TSC. Transformation, marginal entropy, joint and conditional entropies. Channel capacity, channel efficiency and redundancy. Cascading channel, Continuous channel, Capacity of gaussian channel. The techniques of source coding and data compression: Mathematical Model of Information Source; average code length, classification of cod, code efficiency and redundancy. Entropy coding: Shannon-Fano Codes, Shannon Codes, Huffman Coding. Types of Errors. Error control coding (channel coding): Source of Errors; Information Rate; Linear Block Codes; Minimum Distance & Correction. Hamming Code: Hamming weight, Hamming distance. Convolution Encoder: A convolutional encoder, Encoder representation, State Diagram, Trellis Diagram. The Viterbi Decoding Algorithm: Maximum Likelihood Decoding. Cyclic Code: Generator Polynomial of a Cyclic Code, Generator Matrix of a Cyclic Code, Syndrome Calculation and Error Detection.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

In this course, students are guided by:

- Using different examples.
- Using different styles of discussion that aim to connect the theoretical and practical sides.
- Asking questions and giving exercises that require analysis and conclusions related to lectures.
- Encourage students to participate in discussions and do the practical work.
- Encourage students to work in groups.

Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	72	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	6 and 12	LO #1 to #3 and #4 to #6
	Assignments	2	10% (5)	2 and 13	LO #3 to #6
	Projects / Lab.	-	-	-	-
	Report	1	10% (10)	13	LO #3, #4 and #6
Summative assessment	Midterm Exam	2hr	10% (10)	9	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)



المنهاج الاسبوعي النظري

	Material Covered
Week 1	Review the Probability: Joint probability, Conditional Probability, Introduction to information measurement: Information theory, Information source, Self-information.
Week 2	Entropy, Source entropy rate, Mutual information, Types of channels: Discrete memory-less channels: Channel representation, Channel matrix, Special channels: Loss less channel, Noise less channel, Deterministic channel, BCS, TSC.
Week 3	Transformation, marginal entropy, joint and conditional entropies.
Week 4	Channel capacity, channel efficiency and redundancy.
Week 5	Cascading channel, Continuous channel, Capacity of gaussian channel.
Week 6	The techniques of source coding and data compression: Mathematical Model of Information Source; average code length, classification of cod, code efficiency and redundancy.
Week 7	Entropy coding: Shannon-Fano Codes, Shannon Codes.
Week 8	Huffman Coding.
Week 9	Types of Errors. Error control coding (channel coding): Source of Errors; Information Rate; Linear Block Codes; Minimum Distance & Correction.
Week 10	Hamming Code: Hamming weight, Hamming distance.
Week 11	Convolution Encoder: A convolutional encoder, Encoder representation
Week 12	Convolution Encoder: State Diagram, Trellis Diagram.
Week 13	The Viterbi Decoding Algorithm: Maximum Likelihood Decoding.
Week 14	Cyclic Code: Generator Polynomial of a Cyclic Code, Generator Matrix of a Cyclic Code
Week 15	Cyclic Code: Syndrome Calculation and Error Detection.
Week 16	Preparatory week before the final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Digital Communication" by: J.G. Proakis "Modern Digital and Analog Communication Systems" by Lathi "FUNDAMENTALS of INFORMATION THEORY and	No



	CODING DESIGN" by: Roberto Togneri and Christopher J.S. deSilva. "FUNDAMENTALS OF COMMUNICATION SYSTEMS " Second Edition, by: John G. Proakis and Masoud Salehi.	
Recommended Texts	" Information coding techniques " second edition, by: R Avudaiammal. "ESSENTIALS OF ERROR-CONTROL CODING" by: Jorge Castiñeira Moreira and Patrick Guy Farrell.	No
Websites	NONE	

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.

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية



Module Title	Microcontroller		Module Delivery		
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	COE 313				
ECTS Credits	3				
SWL (hr/sem)	75				
Module Level		UGIII			Semester of Delivery
Administering Department		Communications Engineering	College	College of Engineering	
Module Leader	م.م. محمد ناظم جواد		e-mail		
Module Leader's Acad. Title			Module Leader's Qualification		
Module Tutor	Name (if available)		e-mail	E-mail	
Peer Reviewer Name		Name	e-mail	E-mail	
Scientific Committee Approval Date		30-8-2025	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 Objectives أهداف المادة الدراسية	100. Introduce the basic microcontroller concepts and type to of microcontroller. 101. Impart knowledge on the concepts of Embedded Systems and Challenges. 102. Impart knowledge on the concepts of Internet of Things. 103. Impart knowledge on the concepts of Arduino and types.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate knowledge and understanding of the fundamental concepts, principles, and theories underlying microcontroller design and theory, as well as principles of embedded systems, with core knowledge. 2. Explain the embedded systems and their applications. 3. Demonstrate achievement of subject knowledge, particularly via seminars. 4. Explain the basic knowledge of Arduino.



5. Arduino program structure.

1. Introduction to Microcontrollers:

- What is a Microcontroller? Definition, core components (CPU, memory, I/O ports, timers, etc.), and a comparison with microprocessors.
- Embedded Systems: Understanding the role of microcontrollers within embedded systems.
- Microcontroller Architectures: Discussion of common architectures like Harvard vs. Von Neumann.
- Key Microcontroller Features: Overview of key features such as clock frequency, memory size, number of I/O pins, and peripheral devices.

2. Microcontroller Architecture and Organization (e.g., 8051, PIC, ARM):

- **Central Processing Unit (CPU):**
 - Arithmetic Logic Unit (ALU): The part of the CPU that performs arithmetic and logic operations.
 - Registers: General-purpose registers, special function registers (SFRs), program counter (PC), and stack pointer (SP).
- **Memory Organization:**
 - Types of Memory: ROM (Read-Only Memory) and RAM (Random-Access Memory).
 - Memory Maps: How memory is organized and addressed within the microcontroller.
- **Input/Output (I/O) Ports:**
 - Function of I/O ports for connecting to external devices.
 - Configuring ports as input or output.
- **Pin Diagrams and Pin Descriptions:** A detailed explanation of the functions of each pin on a specific microcontroller chip.

3. Instruction Set and Programming:

- **Instruction Set:** The set of commands that the CPU can understand and execute.
- **Addressing Modes:** How the microcontroller specifies the location of data to be processed.
- **Assembly Language Programming:**
 - Assembler directives and syntax.
 - Writing, assembling, and debugging simple programs.
- **High-Level Language Programming (e.g., C/C++):**
 - Embedded C programming.
 - Using compilers for microcontrollers.
 - Bit-wise operations and other techniques for hardware control.

4. Interfacing:

- **Analog-to-Digital Converter (ADC) and Digital-to-Analog Converter (DAC):**
 - Converting analog sensor signals to digital values.
 - Generating analog output signals.

Indicative Contents

المحتويات الإرشادية

Description	Introduction to microcontroller (Hardware / IDE overview). Introduction to DSP Processors (Hardware / IDE overview). Examples: Blinking LEDs, Fading of LED, Circling of LEDs (FOR loop). Serial monitoring: Controlling of LEDs from computer, Reading analog and digital inputs. Digital inputs: Controlling LED using push button. Switching ON a relay. Analog inputs: Controlling a DC motor (PWM), Changing the brightness of LEDs using potentiometers, LCD displays: Wiring of LCD screen with Arduino, Displaying a message in LCD screen, Screen navigation on LCD, Turn ON a LED by entering the password, Knowing the status of the LED, Scrolling of text, Displaying room temperature using LM 35 temperature sensor. Seven segment display: Simple automatic countdown and count up (FOR loop), Increment or decrement a number by using push button. Servo motors: Indexing of Servo motor, Direction control of Servo Motor.
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The primary strategy adopted for delivering this module is to encourage students' participation in the lecture while 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.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	12	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	0.8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	75		

Module Evaluation

تقييم المادة الدراسية

		Time/Num ber	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (5)	3 and 12	LO #1 to #3 and #4 to #6
	Assignments	2	10% (5)	3 and 13	LO #3 to #7
	Projects / Lab.	1	10% (10)	Continuous	All



	Report	1	10% (10)	13	LO #3, #4 and #6
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO #1 - #5
	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 Embedded Systems (Hardware & Software).
Week 2	Introduction to Microcontroller (Hardware & Software).
Week 3	Introduction to DSP Systems (Hardware & Software).
Week 4	Arduino Types and hardware description
Week 5	Arduino software and program structure
Week 6	Arduino Data Types and Functions
Week 7	Arduino Variables & Constants and operators
Week 8	Arduino Control Statements and Loop
Week 9	Arduino Functions, Time, and Libraries
Week 10	Arduino Pulse Width Modulation
Week 11	Introduction to Raspberry pi
Week 12	Raspberry pi Types and hardware description
Week 13	Raspberry pi software and program structure
Week 14	Revision
Week 15	Final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to the fundamental of LAB and devices use
Week 2	Experiment: Blinking LEDs, Fading of LED, Circling of LEDs (FOR loop)
Week 3	Experiment: Reading Analog Voltage and Printed out to The Serial Monitor
Week 4	Experiment: Digital Input Controlling LED using pushbutton. Switching ON a relay
Week 5	Experiment: Controlling LED using (Light Dependent Resistor) LDR Sensor
Week 6	Experiment: Controlling LED Using IR Remote Sensor
Week 7	Experiment: LCD Liquid Crystal Display Displaying a Message in LCD Screen



Week 8	Experiment: Measure the Temperature and Humidity Using DHT11 Sensor and Display Result on The LCD Screen
Week 9	Experiment: Measure the Distance Using Ultrasonic Sensor and Display Result on The LCD Screen
Week 10	Raspberry pi tools & Board
Week 11	Raspberry pi sensors
Week 12	Blinking LEDs using raspberry pi
Week 13	Project
Week 14	Revision
Week 15	Final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	• Embedded Systems: Real-Time Interfacing to Arm Cortex-M Microcontrollers by Jonathan W. Valvano: A popular choice for those learning to program the widely-used Arm Cortex-M family of microcontrollers. • Getting Started with Arduino by Massimo Banzi: While Arduino is a development board and not a microcontroller itself, this book is an excellent entry point for absolute beginners as it simplifies the process of microcontroller programming and hardware interaction.	Yes
Recommended Texts	• The 8051 Microcontroller and Embedded Systems by M.A. Mazidi: A classic and highly-regarded book for a foundational understanding of microcontrollers, particularly the 8051 family. • Programming Embedded Systems in C and C++ by Michael Barr: This book focuses on the practical aspects of programming microcontrollers, which is crucial for building real-world applications.	No
Websites	None	

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.

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information						
معلومات المادة الدراسية						
Module Title	Optical communications		Module Delivery			
Module Type	Core		☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar			
Module Code	COM 314					
ECTS Credits	4					
SWL (hr/sem)	100					
Module Level	UGIII	Semester of Delivery	2			
Administering Department	Communications Engineering	College	College of Engineering			
Module Leader	م.د. عبدالوهاب عيسى حمزة		e-mail			
Module Leader's Acad. Title			Module Leader's Qualification			
Module Tutor	Name (if available)		e-mail			
Peer Reviewer Name	Name		e-mail	E-mail		
Scientific Committee Approval Date	30-8-2025		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 Objectives أهداف المادة الدراسية	104. Studying the optical fiber waveguide and the ray transmission theory 105. Construction of the optical fiber wave guide and studying the effective parameters of the optical fiber 106. Studying the types of the optical fiber and classification based on the index profile. 107. Studying the characteristics of the transmission theory 108. Studying the optical sources such as the laser sources, LED, and studying the laser principles 109. Studying the optical emission in the semiconductor, and studying the optical transmitter and receiver. 110. Studying the principle of the operation detectors.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate the knowledge and understanding of the fundamental concepts, such as principles of optical fiber waveguide and ray transmission theory such as total internal reflection, optical losses, and optical transmitter and receiver to process the problems in optical comm. systems. 2. Understand process construction of optical fiber, types of optical fibers, , understanding the major factors in the optical fiber such as acceptance angle, numerical aperture, critical angle, relative refractive index difference, the internal rays in the optical fiber, . 3. Demonstrate achievement of a subject knowledge, particularly via seminars. 4. Solving additional, more challenging exam problems. 5. Identify appropriate design and governance problems and formulate clear objectives using analytical data.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (4 hrs) • Theoretical lectures (28 hrs) • Lap (28)
Description	a- Introduction to optical communications systems: Historical development, The general system, Advantages of optical fiber communication, Optical fiber waveguides, Ray transmission theory, total Internal reflection

	(TIR): acceptance angle, numerical aperture, relative refractive index difference, meridional and skew ray, Modes in a planar guide, Multimode-step index fiber, Multimode-graded index fiber, single-mode step index fiber, and single-mode graded fiber. b- Transmission characteristics of optical fibers, attenuation, material absorption, intrinsic-absorption, extrinsic absorption, linear scattering losses, Rayleigh scattering, Mie-scattering, non-linear scattering, Stimulated Brillouin scattering, Stimulated Raman scattering, Fiber-bend losses, Dispersion, inter-modal dispersion, material dispersion, waveguide dispersion, intra-modal dispersion, Modal-noise. c- Fiber-Joint, fiber Splice, fiber connectors, Fresnel reflection, Optical transmitter, laser basic, optical emission from semiconductors, the $p-n$ junction, spontaneous emission, Optical-receiver, Analog optical receiver noise (shot noise), Optical power budget d- photodetectors, photo-detectors principles, Quantum efficiencies, types of photo detectors, p-n photo diode, p-i-n photo diode, Speed of response and traveling-wave photodiodes, Avalanche photodiodes (APD), Phototransistor, Digital optical receiver noise (quantum noise),
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	In this course, students are guided by: - Using different examples. - Using different styles of discussion that aim to connect the theoretical and practical sides. - Asking questions and giving exercises that require analysis and conclusions related to lectures. - Encourage students to participate in discussions and do the practical work. - Encourage students to work in groups.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem)	63	Structured SWL (h/w)	4
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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	2.5
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	100		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Historical development, The general system, Advantages of optical fiber communication.
Week 2	Optical fiber waveguides, Ray transmission theory, total Internal reflection(TIR): acceptance angle, numerical aperture, relative refractive index difference, meridional and skew ray.
Week 3	Modes in a planar guide, Multimode-step index fiber, Multimode-graded index fiber, single-mode step index fiber, single-mode graded fiber
Week 4	Transmission characteristics of optical fibers, attenuation, material absorption, intrinsic-absorption, extrinsic absorption,
Week 5	linear scattering losses, Rayleigh scattering, Mie-scattering, non-linear scattering, Stimulated Brillouin scattering, Stimulated Raman scattering, Fiber-bend losses,
Week 6	Dispersion, inter-model dispersion, material dispersion,
Week 7	waveguide dispersion, intra-model dispersion, Modal-noise
Week 8	Fiber-Joint, fiber Splice , fiber connectors, Fresnel reflection.
Week 9	Optical transmitter, laser basic, optical emission from semiconductors,
Week 10	The $p-n$ junction, spontaneous emission. Optical-receiver,



Week 11	photodetectors, photo-detectors principles, Quantum efficiency.
Week 12	types of photo detectors , p-n photo diode p-i-n photo diode,
Week 13	Speed of response and traveling-wave photodiodes, Avalanche photodiodes(APD),
Week 14	Phototransistor, Digital optical receiver noise (quantum noise),
Week 15	Analog optical receiver noise (shot noise), Optical power budget

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Introduction to the lab and get started with use of tools which uses in the experiments.
Week 2	Optical Fiber Communication System- part 1
Week 3	Optical Fiber Communication System- part 2
Week 4	Optical Sources- part 1
Week 5	Optical Sources- part 2
Week 6	Optical Modulators -part1
Week 7	Optical Modulators-part 2
Week 8	Optical Modulators- part 3
Week 9	Optical Fiber Attenuation- part 1
Week 10	Optical Fiber Attenuation-part 2
Week 11	Optical Fiber Attenuation –part 3
Week 12	Digital and analog optical fiber links- part 1
Week 13	Digital and analog optical fiber links- part 2
Week 14	Digital and analog optical fiber links- part 3
Week 15	Preparatory week before the final exam

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	John M. Senior "Optical Fiber Communications Principles and Practice", Third edition, 2009.	Yes
Recommended Texts	- Harry J. R. Dutton "Understanding Optical Communications", First edition, 1998. - John Wiley: "Fiber optic communications	No



	systems", Third edition, 2002.	
Websites	Microsoft Help, https://support.microsoft.com/en-us/products Learn Microsoft Office, https://www.goskills.com/Microsoft-Office	

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.

الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information

معلومات المادة الدراسية



Module Title	Radio Wave Propagation		Module Delivery		
Module Type	Core		☒ Theory ☐ Lecture ☐ Lab ☐ Tutorial ☐ Practical ☐ Seminar		
Module Code	COE 310				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level		UGIII			Semester of Delivery
Administering Department		Communications Engineering	College	College of Engineering	
Module Leader		أ.د. قيس شريف مجدي		e-mail	
Module Leader's Acad. Title		Associate professor	Module Leader's Qualification		MSc in Electronics and Communication
Module Tutor		Name (if available)		e-mail	E-mail
Peer Reviewer Name		Name		e-mail	E-mail
Scientific Committee Approval Date		30-8-2025		Version Number	1.0

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Antennas Theory – COM303	Semester	1
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

Module Objectives أهداف المادة الدراسية	111. To introduce the fundamental mathematical and physical concepts related to radio wave propagation. 112. To provide knowledge of the main principles and mechanisms of electromagnetic wave propagation in different media. 113. To explain the different modes of propagation, including ground wave, sky wave, and space wave.
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	114. To develop an understanding of the practical implications of propagation phenomena for wireless communication systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate knowledge and understanding of the fundamental principles and mechanisms of radio wave propagation in different media. 2. Analyze and interpret the behavior of ground waves, sky waves, and space waves, and their impact on wireless communication systems. 3. Apply mathematical models and problem-solving approaches to predict and evaluate propagation performance under varying environmental conditions. 4. Identify and explain the practical limitations and challenges of propagation phenomena in real-world communication links. 5. Communicate technical findings effectively through written reports, assignments, and collaborative work.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. • Course introduction (2 hrs) • Working with Power point (15 hrs) • Theoretical lectures (30 hrs)
Description	Fundamental Concepts: propagation at different frequencies; the fundamental equation for free space propagation. Propagation mechanisms: Transmission; Reflection; Absorption; Refraction; Diffraction; Scattering. Factors affecting the radio waves propagation: Shape of the earth; The atmosphere: Troposphere; Tropospheric scatter; Duct propagation; Stratosphere. Electrical properties of the ionosphere; Effect of Earth's magnetic field. Structure of the ionosphere; Characteristics of different layers. Ionosphere fading: interference fading, Polarization fading, Absorption fading, and skip fading. Modes of wave propagation: Ground wave propagation; Space wave propagation. Modes of wave propagation: Sky wave propagation. Interaction with the objects on the ground; propagation within, near, and into buildings.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	In this course, students are guided by: • Using different examples. • Using different styles of discussion that aim to connect the theoretical and practical sides. • Asking questions and giving exercises that require analysis and conclusions related to lectures. • Encourage students to participate in discussions and do the practical work. • Encourage students to work in groups.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا

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	52	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

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (10)	6 and 12	LO #1 to #3 and #4 to #6
	Assignments	2	10% (5)	2 and 13	LO #3 to #6
	Projects / Lab.	-	-	-	-
	Report	1	10% (10)	13	LO #3, #4 and #6
Summative assessment	Midterm Exam	2hr	10% (10)	9	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	The Wave Equation, propagation at different frequencies, and the fundamental equation for propagation in free space, lossless dielectric, lossy dielectric, and a good conductor medium.
Week 2	Propagation mechanisms: Transmission, Reflection, Absorption.
Week 3	Propagation mechanisms: Refraction, Diffraction, Scattering.
Week 4	Factors affecting the radio waves propagation: Shape of the earth, the atmosphere



Week 5	Troposphere; Tropospheric scatter;
Week 6	Duct propagation; Stratosphere.
Week 7	Electrical properties of the ionosphere: Effect of Earth's magnetic field
Week 8	Structure of the ionosphere; Characteristics of different layers
Week 9	Modes of wave propagation: Ground wave propagation; Space wave propagation.
Week 10	Modes of wave propagation: Sky wave propagation
Week 11	Ionosphere fading: interference fading, Polarization fading, Absorption fading, skip fading
Week 12	Interaction with the objects on the ground; propagation within, near, and into buildings
Week 13	Radio noise: impulse noise; fluctuation noise; solar radio noise
Week 14	Rain-induced propagation effects, Advanced Propagation Effects
Week 15	Integration with Antenna Design, case studies of propagation in modern wireless communication systems (e.g., satellite links, mobile networks)

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	- C.A. Balanis, Antenna Theory: Analysis and Design, 4th Edition, Wiley, 2016. - D.M. Pozar, Microwave Engineering, 4th Edition, Wiley, 2012. - J.G. Lee, An Introduction to Radio Wave Propagation, Babani, 1993. - Robert K. Crane, Propagation Handbook for Wireless Communication System Design, CRC Press, 2003.	Yes (two) and two are free and accessible online
Recommended Texts	- Harish, A.R., & Sachidananda, M., Antennas and Wave Propagation, Oxford University Press, 2007. - Richards, J.A., Radio Wave Propagation: An Introduction for the Non-Specialist, Springer, 2008. - Ippolito, L.J., Radio Propagation for Modern Satellite Systems: Theory and Practice, Springer, 2017.	No
Websites	IEEE Xplore Digital Library : https://ieeexplore.ieee.org (Access to research papers in antennas, propagation, and wireless communication). ITU (International Telecommunication Union): https://www.itu.int (Official reports and standards on radio wave propagation and communication systems). NASA Radio Propagation Studies: https://www.nasa.gov (Resources and reports on space communication and propagation effects). Antenna Theory Online Resource: https://www.antenna-theory.com (Educational site with	



clear explanations on antennas and propagation).

Grading Scheme

مخطط الدرجات

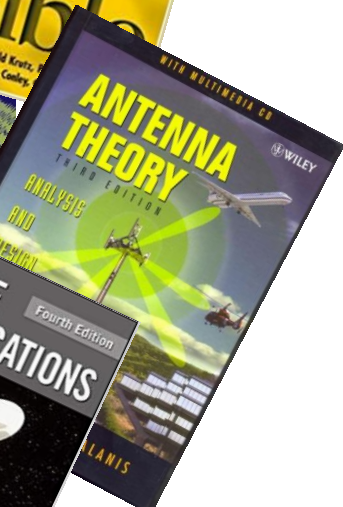
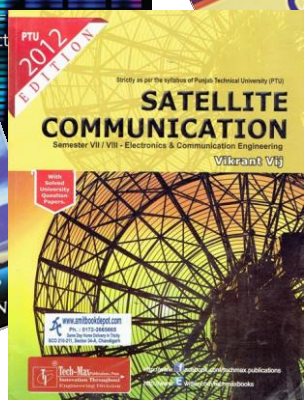
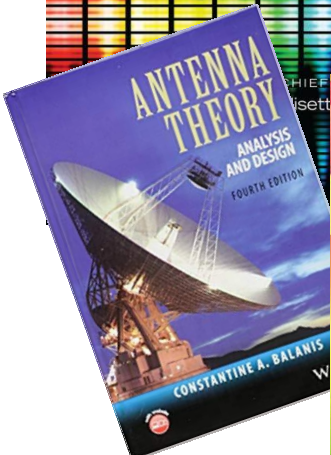
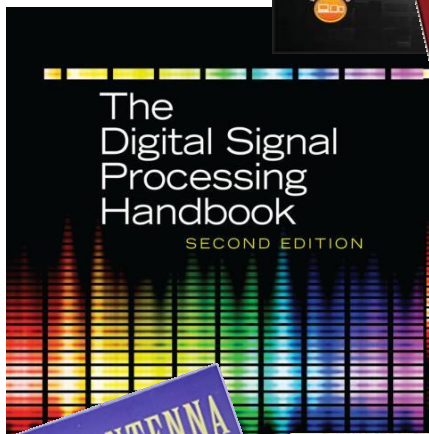
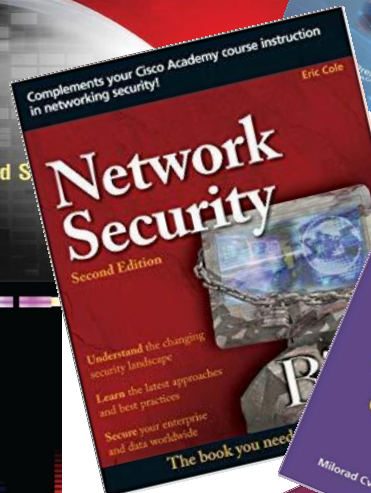
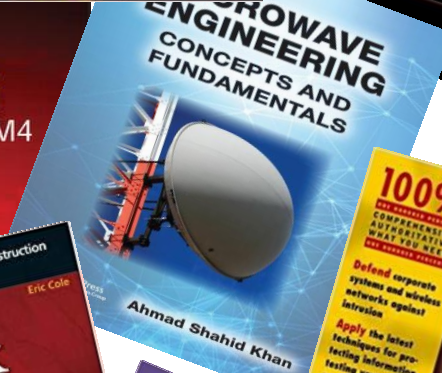
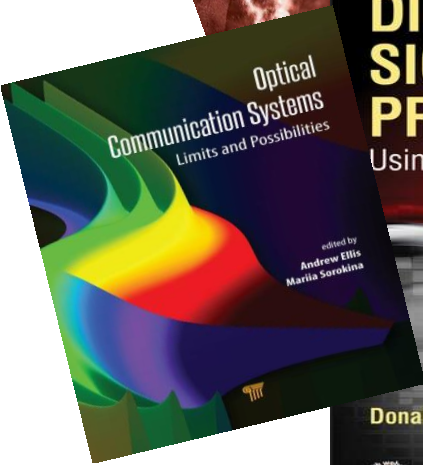
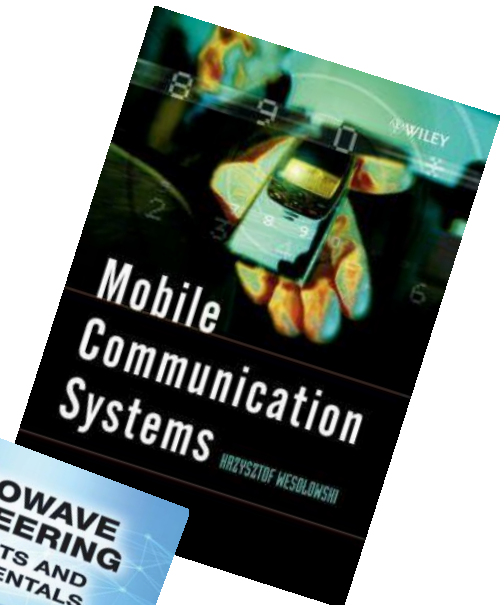
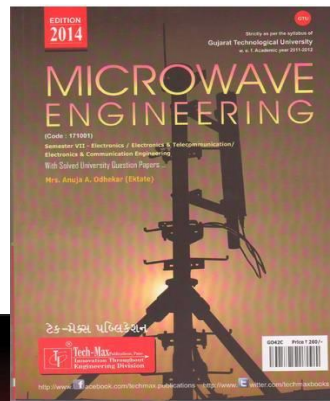
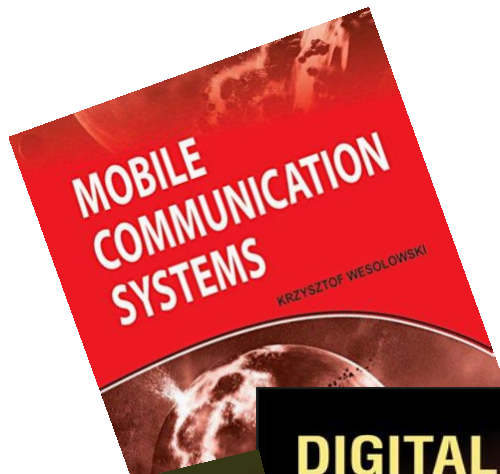
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	B - Very Good	جيد جدا	80 - 89	Above average with some errors
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المرحلة الرابعة







كلية العراق الجامعة
قسم هندسة الاتصالات

استمارة وصف البرنامج الأكاديمي
للعام الدراسي 2025-2026

اسم المقرر: Mobile Communication Systems I and II
رمز المقرر (ان وجد):
اسم التدريسي: د. محمود عارف الشريدة
المرحلة : الرابعة



وصف المقرر نظم الاتصالات المتنقلة 1 و 2 (Mobile Communication System I and II)

يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنأ عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ولابد من الربط بينها وبين وصف البرنامج.

1. المؤسسة التعليمية	كلية العراق الجامعة
2. القسم العلمي / المركز	هندسة الاتصالات
3. اسم / رمز المقرر	Mobile Communication
4. أشكال الحضور المتاحة	حضور يومي
5. الفصل / السنة	الاول
6. عدد الساعات الدراسية (الكلي)	2 ساعات نظري + 2 ساعات عملي + ساعة مناقشة
7. تاريخ إعداد هذا الوصف	2019-12-1
8. أهداف المقرر	Upon completion of this course the student will be able to understand the basic operation principle of cellular mobile system and be familiar with wireless network and deferent types of antenna used in gsm system

9. مخرجات المقرر وطرائق التعليم والتعلم والتقييم
أ- المعرفة والفهم تعريف الطالب على المفاهيم الاساسية للاتصالات المتنقلة



ب - المهارات الخاصة بالمقرر. 1- استعمال امثلة متعددة تعكس استخداماتها بحياتنا اليومية 2-توظيف قدرة الطالب على الحوار والمناقشة ج- مهارات التفكير 1 - القدرة على التفكير في حل المسائل الخاصة بمادة الاتصالات المتنقلة 2 - تنمية قدرة الطالب على التعامل مع المسائل الهندسية بصورة جيدة د - المهارات العامة والمنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).
طرائق التعليم والتعلم - المحاضرات الصيفية الاسبوعية - اكتساب المعرفة من خلال المصادر الخارجية والانترنت - الواجبات والتقارير الخاصة بحل المسائل - طرح الافكار للمناقشة والحوار وتحفيز الطالب لاكتساب العلوم بشكل ذاتي
طرائق التقييم - امتحان فصلي - امتحان اسبوعي (Quiz) غير منتظم بتوقيات يهدف لتحفيز الطالب على المتابعة - المشاركة اليومية التي تعكس التقييم اليومي للطالب - الامتحان النهائي



10. بنية المقرر	
Week	Syllabus
1	Introduction To Wireless System
2	Introduction To Cellular System
3	Mobile Communication Evaluation
4	Cellular Concept
5	Channel Allocation Schemes
6	Handoff Strategies
7	Midterm Exam
8	GSM
9	GSM Network Area
10	GSM Subscriber Services
11	Radio Communication Basic
12	Definitions of Radio communication terms
13	Characteristics Of Radio Frequency Bands
14	Wireless Network
15	Antenna For Cellular System
16	Final Exam
17	GSM architecture
18	GSM interface and protocol stack
19	GSM PLMN interface

20	GSM radio interface
21	GSM ABIS interface
22	GSM A interface
23	Mapping GSM layers onto OSI layers
24	GSM and TDMA techniques
25	Midterm exam
26	GSM system operation and traffic cases
27	CDMA technology
28	Speech coding in GSM
29	Wireless modulation technique
30	Orthogonal frequency division multiplexing OFDM

11. البنية التحتية	
1- الكتب المقررة المطلوبة	
Mobile Wireless Communications Mischa Schwart	المراجع الرئيسية (المصادر)





كلية العراق الجامعة
قسم هندسة الاتصالات

استمارة وصف البرنامج الأكاديمي
للعام الدراسي 2024-2025

اسم المقرر: (Digital Signal Processing I and II)
رمز المقرر (ان وجد):
اسم التدريسي: م.م. علاء ابراهيم
المرحلة : الرابعة

وصف المقرر معالجة الإشارة الرقمية 1 و 2 [Digital Signal Processing I and II]

يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنناً عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ولابد من الربط بينها وبين وصف البرنامج.

1. المؤسسة التعليمية	كلية العراق الجامعة
2. القسم العلمي / المركز	هندسة الاتصالات
3. اسم / رمز المقرر	Digital Signal Processing
4. أشكال الحضور المتاحة	دوام يومي رسمي
5. الفصل / السنة	الاول والثاني(2019\2020)
6. عدد الساعات الدراسية (الكلي)	2 ساعات نظري+2 ساعات عملي+ساعة مناقشة
7. تاريخ إعداد هذا الوصف	2019-12-16
8. أهداف المقرر	في المجال الزمني والترددي واستخداماتها الهدف من هذا المقرر هو تعليم الطالب اساسيات معالجة الإشارة في معالجة اشارات الصوت والصورة اضافة الى استخدام المرشحات الرقمية .
9. مخرجات المقرر وطرائق التعليم والتعلم والتقييم	

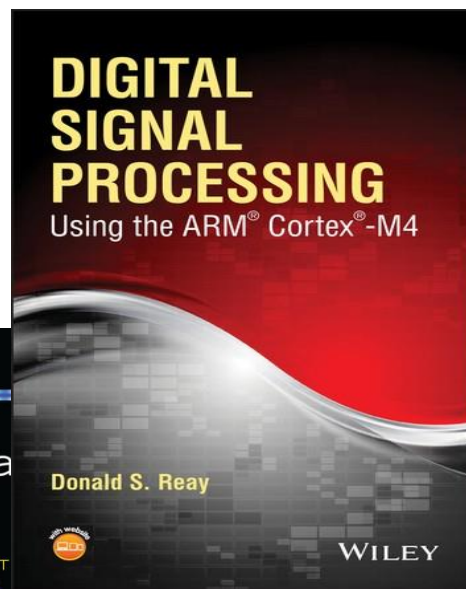
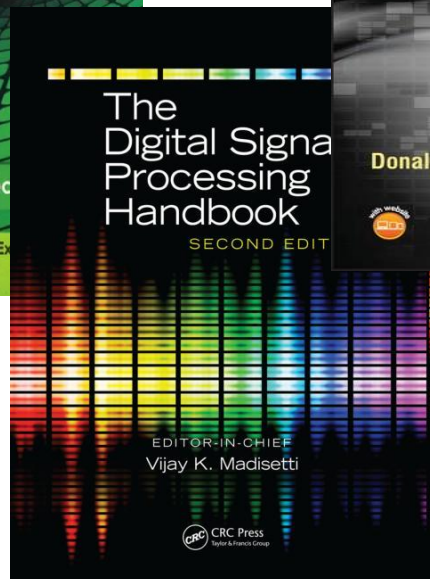
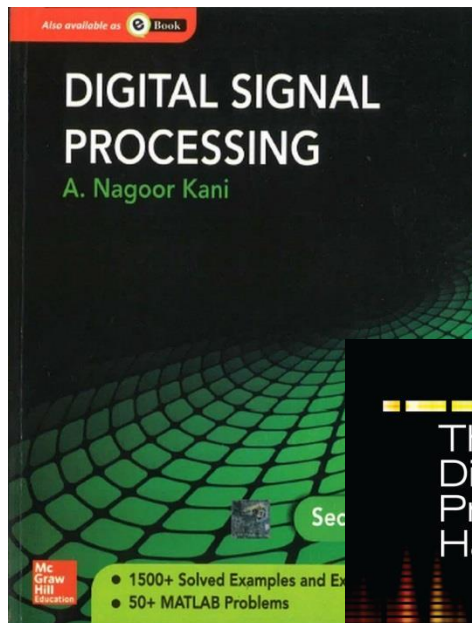
أ- المعرفة والفهم 1- تعريف الطالب على المفاهيم الاساسية لمعالجة الاشارة الرقمية 2- ادراك الاسس النظرية الخاصة بتحويل الإشارة التماثلية إلى رقمية 3- تصميم المرشحات الرقمية ودراسة استجابتها ب - المهارات الخاصة بالمقرر. 1- اكتساب مهارات وامكانيات التحليلات الهندسية الرياضية بما يمكن الطالب من تحديد وحل المشاكل الهندسية 2- جعل الطالب قادر على استخدام برامج محاكاة الانظمة ج- مهارات التفكير 1 - القدرة على التفكير في حل المسائل الخاصة بمادة معالجة الاشارة الرقمية 2- تنمية قدرة الطالب على التعامل مع المكونات الرقمية كاسلوب حل د - المهارات العامة والمنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).
طرائق التعليم والتعلم - المحاضرات الصفية الاسبوعية - اكتساب المعرفة من خلال المصادر الخارجية والانترنت - الواجبات والتقارير العلمية - طرح الافكار للمناقشة والحوار وتحفيز الطالب لاكتساب العلوم بشكل ذاتي
طرائق التقييم - امتحان فصلي عدد 4 - امتحان يومي غير منتظم بتوقيات يهدف لتحفيز الطالب على المتابعة - المشاركة اليومية التي تعكس التقييم اليومي للطالب - نشاط علمي وتقارير علمية و واجبات يومية - التقييم المختبري (امتحانات العملي) - امتحان نهاية السنة



10. البنية التحتية

Week	Syllabus
1	Introduction to Discrete-Time Signals, Complex Sequences, Some Fundamental Sequences, Signal Duration
2	Periodic and Aperiodic Sequences Symmetric Sequences Signal Manipulations
3	Discrete-Time Systems, Systems Properties
4	Convolution Properties, Performing Convolutions
5	Difference Equations
6	Introduction to frequency response
7	Filters, interconnection of systems
8	The Discrete-Time Fourier Transform, DTFT Properties
9	LSI Systems and LCCDEs, Performing Convolutions
10	Solving Difference Equations, Inverse Systems
11	Introduction to Sampling, Analog-to-Digital Conversion, Periodic Sampling
12	Quantization and Encoding
13	Digital-to-Analog Conversion
14	Discrete-Time Processing of Analog Signals
15	Sample Rate Conversion
16	Introduction of the z-Transform, Definition and Properties of the z-Transform,
17	The Inverse z-Transform, Partial Fraction Expansion
18	Power Series , Contour Integration
19	The One-Sided z-Transform
20	Introduction to the DFT, Discrete Fourier Series
21	Discrete Fourier Transform, DFT Properties
22	Discrete Fourier Transform, DFT Properties
23	Sampling the DTFT
24	Linear Convolution Using the DFT
25	Introduction to the Fast Fourier Transform
26	Radix-2 FFT Algorithms , Decimation-in-Time FFT
27	Radix-2 FFT Algorithms , Decimation-in-Frequency FFT
28	FFT Algorithms for Composite N
29	FFT Algorithms for Composite N
30	Prime Factor FFT

1. Monson H. Hayes," Schaum's Outline of Theory and Problems of Digital Signal Processing", McGraw- Hill Companies.	12- الكتب المقررة المطلوبة
1. John G. Proakis, Dimitris G. Manolakis," Digital Signal Processing", 3rd Edition. 2. Vinay K. Ingle,John G. Proakis," Digital Signal Processing Using MATLAB".	13-المراجع الرئيسية (المصادر)





كلية العراق الجامعة
قسم هندسة الاتصالات

استمارة وصف البرنامج الأكاديمي
للعام الدراسي 2025-2026

اسم المقرر: Microwave Engineering II
رمز المقرر (ان وجد): -
اسم التدريسي: أ.د. زكي عبدالله احمد
المرحلة : الرابعة



وصف المقرر هندسة الموجات الدقيقة 2 [Microwave Engineering II]

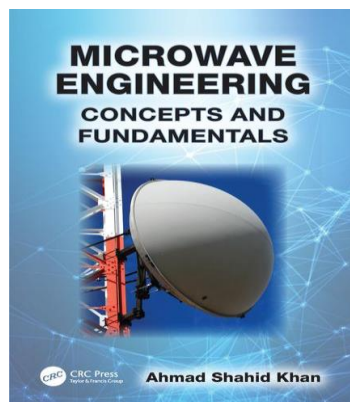
يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنأ عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ولابد من الربط بينها وبين وصف البرنامج.

1. المؤسسة التعليمية	كلية العراق الجامعة
2. القسم العلمي / المركز	هندسة الاتصالات
3. اسم / رمز المقرر	Microwave Engineering 2
4. أشكال الحضور المتاحة	دوام يومي رسمي
5. الفصل / السنة	الاول / 2020-2019
6. عدد الساعات الدراسية (الكلية)	ساعتان نظري + ساعتان عملي + ساعة مناقشة
7. تاريخ إعداد هذا الوصف	2019-12-25
8. أهداف المقرر: اكساب الطالب المعرفة عن موضوع هندسة المايكرووف و التطبيقات العملية في هذا المجال	

9. مخرجات المقرر وطرائق التعليم والتعلم والتقييم

أ- المعرفة والفهم 1. تعريف الطالب على المفاهيم الاساسية 2. ادراك الاساس النظري والعملية ب - المهارات الخاصة بالمقرر. 1. اكتساب مهارات وامكانيات عملية يمكن تطبيقها في مجال الحياة العملية. 2. توظيف المهارات التي تعلمها الطالب في تنفيذ المشاريع و الأعمال الخاصة بالاتصالات و تطبيقات المايكرووف في الاخرى في مجال العمل. ج- مهارات التفكير 5. القدرة على التفكير في حل المسائل الخاصة بمادة المايكرووف 6. تنمية قدرة الطالب على التعامل مع المكونات الرقمية كاسلوب حل للمشاكل الفنية التي تواجه المهندس المختص. د - المهارات العامة والمنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).	طرائق التعليم والتعلم - المحاضرات الصفية الاسبوعية - اكتساب المعرفة من خلال المصادر الخارجية والانترنت - الواجبات والتقارير العلمية - طرح الافكار للمناقشة والحوار وتحفيز الطالب لاكتساب العلوم بشكل ذاتي
طرائق التقييم - امتحان فصلي عدد 4 - امتحان يومي غير منتظم بتوقيات يهدف لتحفيز الطالب على المتابعة - المشاركة اليومية التي تعكس التقييم اليومي للطالب - نشاط علمي وتقارير علمية و واجبات يومية - التقييم المختبري (امتحانات العملي) - امتحان نهاية الفصل	

10. بنية المقرر	
Week	Syllabus
1	Measurement Devices
2	
3	
4	Measurements
5	Impedance Matching
6	Microwave Devices
7	Plane Tee
8	
9	Couplers
10	Cavity Klystron
11	Reflex Klystron
12	Travelling Wave Tube
13	
14	
15	Magnetrons
11. البنية التحتية: عرض المحاضرات باستخدام الباور بوينت على الداتاشو و التطبيق العملي في المختبر على تجارب عملية	
3. Foundations for Microwave Engineering, Robert E. Collin, John Wiley & Sons Publication, 2001. 4. Microwave Engineering, David M. Pozar, John Wiley & Sons, Inc. 2012.	
12. الكتب المقررة المطلوبة و المراجع الرئيسية (المصادر)	





كلية العراق الجامعة
قسم هندسة الاتصالات

استمارة وصف البرنامج الأكاديمي
للعام الدراسي 2025-2026

اسم المقرر: Control Engineering I and II
رمز المقرر (ان وجد):
اسم التدريسي: م.م. ضحى كريم خلف
المرحلة : الرابعة

وصف المقرر هندسة السيطرة 1 و 2 (Control Engineering I and II)

يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنأ عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ولابد من الربط بينها وبين وصف البرنامج

1. المؤسسة التعليمية	كلية العراق الجامعة
2. القسم العلمي / المركز	هندسة الاتصالات
3. اسم / رمز المقرر	Control Engineering
4. أشكال الحضور المتاحة	حضور يومي
5. الفصل / السنة	الاول والثاني
6. عدد الساعات الدراسية (الكلي)	2 ساعات نظري+2 ساعات عملي+ساعة مناقشة
7. تاريخ إعداد هذا الوصف	2019-12-1
8. أهداف المقرر	يهدف هذا المقرر لتعليم الطالب اساسيات هندسة التحكم التماثلية والرقمية والتعرف على انواع نظم التحكم، توصيف نظم التحكم، العناصر الأساسية لنظم التحكم،العناصر التربيعية المهتزة، العناصر التكاملية، العناصر التفاضلية، الاستجابة الزمنية، الاستجابة الترددية ومنحنيات الخواص الترددية، استقرار نظم التحكم

9. مخرجات المقرر وطرائق التعليم والتعلم والتقييم

أ- المعرفة والفهم تعريف الطالب على المفاهيم الأساسية لهندسة التحكم ، انواع نظم التحكم، توصيف نظم التحكم، العناصر الأساسية لنظم التحكم ، الاستجابة الزمنية، الاستجابة الترددية ومنحنيات الخواص الترددية، استقرار نظم التحكم
ب - المهارات الخاصة بالمقرر. 1- استعمال امثلة متعددة تعكس استخداماتها بحياتنا اليومية 2-توظيف قدرة الطالب على الحوار والمناقشة
ج- مهارات التفكير 1 - القدرة على التفكير في حل المسائل الخاصة بمادة هندسة التحكم 2 - تنمية قدرة الطالب على التعامل مع المسائل الهندسية بصورة جيدة
د - المهارات العامة والمنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).
طرائق التعليم والتعلم
- المحاضرات الصفية الاسبوعية - اكتساب المعرفة من خلال المصادر الخارجية والانترنت - الواجبات والتقارير الخاصة بحل المسائل - طرح الافكار للمناقشة والحوار وتحفيز الطالب لاكتساب العلوم بشكل ذاتي
طرائق التقييم
- امتحان فصلي - امتحان اسبوعي (Quiz) غير منتظم بتوقيينات يهدف لتحفيز الطالب على المتابعة - المشاركة اليومية التي تعكس التقييم اليومي للطالب - الامتحان النهائي

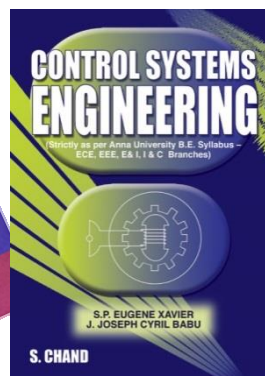
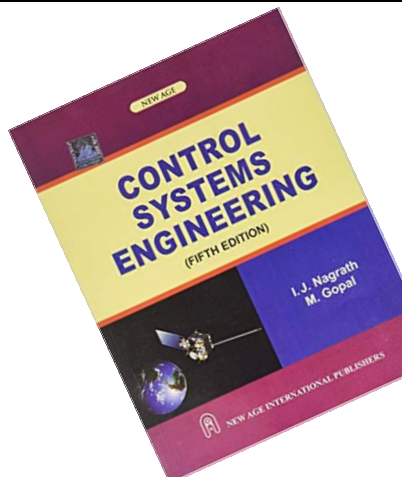


10. بنية المقرر	
Week	Syllabus
1	Introduction to control system: Introduction, Definition(open loop and close loop system)comparison between O/L and C/L control system. Laplace transform theorem function.
2	Mathematical modeling of dynamical system-I:Introduction to mathematical modeling, mathematical representation of system(electrical,mechanical,Rotational mechanical)
3	Mathematical modeling of dynamical system-II:Introduction to mathematical modeling,mathematical representation of systems (electrical,mechanical,Rotational mechanical,Thermal)
4	Block diagram:Rules of Block diagram,Transfer function,block diagram reduction.
5	Transient and steady state response analysis:First order system(step,impulse,ramp responses(
6	Transient and steady state response analysis: Second order:system.
7	Rouths stability criteria
8	Frequency response Analysis, correlation between time domain and frequency domain, control system analysis by bode diagram: Body plots of elementary functions.
9	Frequency response Analysis, correlation between time domain and frequency domain, control system analysis by bode diagram: Body plots of elementary functions.
10	Root locus plots
11	Root locus plots with MATLAB
12	Design of PID controller-II effects of derivative, and integral control action on system performance, Design of P controller, Design of PD controller, Design of PI controller, Design of PID controller
13	Lead compensator design.
14	Lead compensator design.



15	Lead –lag compensator design
16	Final Exam
17	Introduction to digital Control System
18	Z- Transform
19	Inverse Z-Transform & Solving Difference Equation
20	Impulse Response and Data Hold
21	Pulse Transfer Function
22	Realization of Digital Controllers and Digital Filters
23	Time Response Analysis
24	Introduction to Design of Discrete- Time Control System Using Conventional Method / Mapping Between the SPlane and the Z Plane
25	Transient and Steady-State Response Analysis
26	Stability Analysis in Z-plane
27	Jury stability method
28	Root Locus Analysis
29	Design digital controller
30	Design of P controller, Design of PD controller, Design of PI controller. Design of PID controller
31	Final exam

11. البنية التحتية	
	1- الكتب المقررة المطلوبة
Modern control engineering Katsuhiko Ogata, 5th edition	المراجع الرئيسية (المصادر)





كلية العراق الجامعة
قسم هندسة الاتصالات

استمارة وصف البرنامج الأكاديمي
للعام الدراسي 2025-2026

اسم المقرر: Network Design and Security
رمز المقرر (إن وجد):
اسم التدريسي: م.م. عباس فاضل
المرحلة : الرابعة

وصف المقرر امنية ونصميم الشبكات (Network Design and Security)

يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنأ عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ولابد من الربط بينها وبين وصف البرنامج

1. المؤسسة التعليمية	كلية العراق الجامعة
2. القسم العلمي / المركز	هندسة الاتصالات
3. اسم / رمز المقرر	Network Security
4. أشكال الحضور المتاحة	دوام يومي رسمي
5. الفصل / السنة	الاول
6. عدد الساعات الدراسية (الكلي)	2 ساعات نظري وساعة للمناقشة
7. تاريخ إعداد هذا الوصف	2019-12-1
8. أهداف المقرر	يهدف هذا المقرر لتعليم الطالب عن فائدة امنية الشبكات وتطبيقاتها كما ويعرف عن كيفية تطبيقها من خلال استخدام طرق التشفير المتعددة وكيفية فك التشفير باستخدام الخوارزميات.

9. مخرجات المقرر وطرائق التعليم والتعلم والتقييم



أ- المعرفة والفهم تعريف الطالب على المفاهيم الاساسية للتشفير وطرق تشفيرها وطرق فك التشفير ب - المهارات الخاصة بالمقرر. 1- استعمال امثلة متعددة للتشفير تعكس استخداماتها بحياتنا اليومية 2-توظيف قدرة الطالب على الحوار والمناقشة ج- مهارات التفكير 1 - القدرة على التفكير في حل المسائل الخاصة بمادة امنية الشبكات ومسائل التشفير 2 - تنمية قدرة الطالب على التعامل مع المسائل الهندسية بصورة جيدة د - المهارات العامة والمنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).
طرائق التعليم والتعلم - المحاضرات الصفية الاسبوعية - اكتساب المعرفة من خلال المصادر الخارجية والانترنت - الواجبات والتقارير الخاصة بحل المسائل - طرح الافكار للمناقشة والحوار وتحفيز الطالب لاكتساب العلوم بشكل ذاتي
طرائق التقييم - امتحان فصلي - امتحان اسبوعي (Quiz) غير منتظم بتوقيات يهدف لتحفيز الطالب على المتابعة - المشاركة اليومية التي تعكس التقييم اليومي للطالب - الامتحان النهائي



10. بنية المقرر	
Week	Syllabus
1	Introduction : - Cryptography - Different aspect of security - Security attack - Security Service - Security Mechanisms
2	Conventional Encryption: - Symmetric Cipher Model - Cryptanalysis and Brute- force - Classical Techniquess :Subtitution
3	Classical Techniquess :Subtitution -Caeser Cipher -Monoalphabetic
4	Classical Techniquess :Subtitution -Playfair -Hill Cipher
5	Classical Techniquess :Subtitution -Poly Alphabetic -Vigenere cipher
6	Classical Techniquess : Transposition -Rail Fence - Columnar Transposition - Route Cipher
7	Conventional Encryption: Modern Techniques -Block Cipher Primitives (Confusion and Diffusion) -The Feistel Cipher (Decryption Process, Number Rounds)
8	Data Encryption Standard (DES) Part 1
9	Data Encryption Standard (DES) Part 2
10	Advances Encryption Standard (AES)



	Part 1
11	Advances Encryption Standard (AES) Part 2
12	Public Key Encryption RSA Algorithm
13	Examples of RSA Algorithm
14	Public Key Encryption Diffie-Hellman Key Exchange
15	Revision
16	Final Exam

	11. البنية التحتية
Cryptography and Network Security by W. Stalling 2006.	1- الكتب المقررة المطلوبة
Computer Network by Taninbum 2003	المراجع الرئيسية (المصادر)





كلية العراق الجامعة
قسم هندسة الاتصالات

استمارة وصف البرنامج الأكاديمي
للعام الدراسي 2025-2026

اسم المقرر: Antenna Theory
رمز المقرر (ان وجد):
اسم التدريسي: م.د. مرتجى علي ساري
المرحلة: الرابعة

وصف المقرر نظرية الهوائيات [Antenna Theory]

يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنأ عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ولابد من الربط بينها وبين وصف البرنامج.

1. المؤسسة التعليمية	كلية العراق الجامعة
2. القسم العلمي / المركز	هندسة الاتصالات
3. اسم / رمز المقرر	الهوائيات
4. أشكال الحضور المتاحة	دوام يومي رسمي
5. الفصل / السنة	الاول
6. عدد الساعات الدراسية (الكلي)	ساعتان نظري
7. تاريخ إعداد هذا الوصف	2019-12-1
8. أهداف المقرر لتزويد الطالب بالمعلومات الأساسية عن الهوائيات وأنواعها وتطبيقاتها.	

9. مخرجات المقرر وطرائق التعليم والتعلم والتقييم



أ- المعرفة والفهم 1- تعريف الطالب على المفاهيم الأساسية للهوائيات 2- ادراك الاساس النظري والعملي للهوائيات ب - المهارات الخاصة بالمقرر. 1- اكتساب مهارات وامكانيات 2- توظيف قدرات الطالب ج- مهارات التفكير ج - 1 القدرة على التفكير في حل المسائل الخاصة بمادة الهوائيات ج - 2 تنمية قدرة الطالب على التعامل مع المكونات الهوائيات د - المهارات العامة والمنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).
طرائق التعليم والتعلم - المحاضرات الصفية الاسبوعية - اكتساب المعرفة من خلال المصادر الخارجية والانترنت - الواجبات والتقارير العلمية - طرح الافكار للمناقشة والحوار وتحفيز الطالب لاكتساب العلوم بشكل ذاتي
طرائق التقييم - امتحان فصلي عدد 2 - امتحان يومي غير منتظم بتوقيات يهدف لتحفيز الطالب على المتابعة - المشاركة اليومية التي تعكس التقييم اليومي للطالب - نشاط علمي وتقارير علمية و واجبات يومية

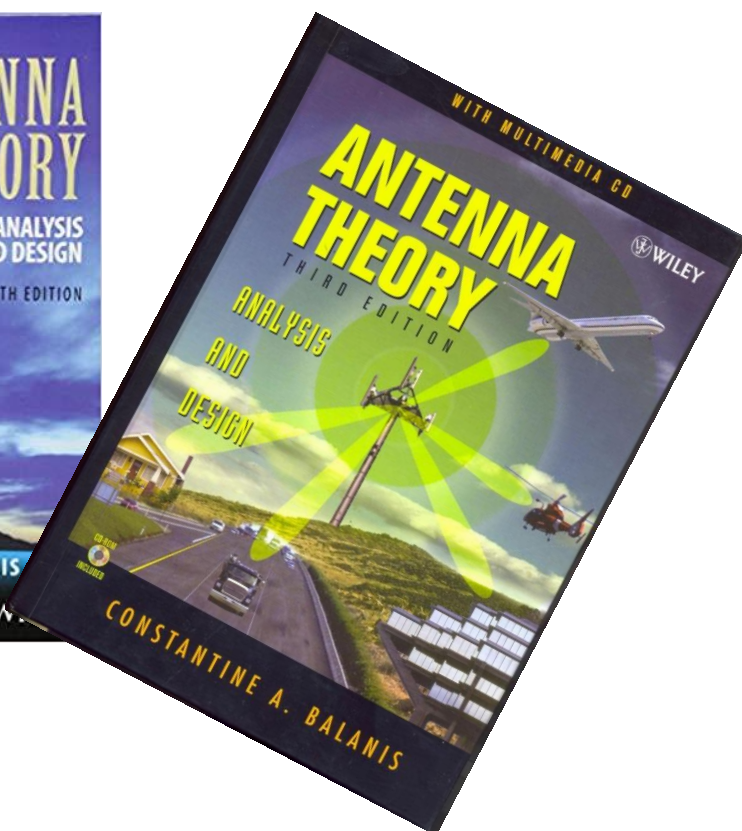
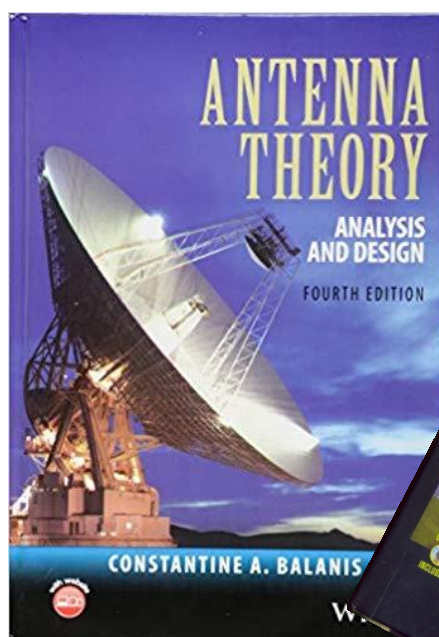


بنية المقرر 10.	
Week	Syllabus
1	Antenna fundamentals/ Antenna basic parameters
2	Antenna parameters
3	Antenna near and far field/ Antenna radiation pattern/ Antenna isotropic radiation
4	Antenna beam and polarization/ Antenna beamwidth/ Antenna reciprocity/ Antenna Poynting vector
5	Types of antennas/ Half –wave dipole antenna/ Half-wave folded dipole antenna/
6	Full wave dipole antenna/ Short dipole antenna
7	Long wire antennas/ V-antennas, Inverted V-antenna/ Rhombic antenna
8	Loop antennas/ Helical antenna/ Aperture antennas/ Horn antenna
9	Slot antennas/ Microstrip antennas/ Lens antennas/ Parabolic reflector antennas
10	Antenna arrays/ Collinear array/ Broad-side array/ end-fire array
11	Parasitic arrays/ Yagi-UDA antenna/ Log periodic antenna
12	Turnstile antenna
13	Spectrum and transmission/ Types of propagation
14	Ionosphere and it's layers/ Terms in wave propagation
15	Exam
11. البنية التحتية	
1. الكتب المقررة المطلوبة	



Antenna Theory: Analysis and Design/ Constantine A. Balanis
Antenna Theory and Design / Warren L. Stutzman,
Antennas. John D. Kraus

المراجع الرئيسية
(المصادر)





كلية العراق الجامعة
قسم هندسة الاتصالات

استمارة وصف البرنامج الأكاديمي
للعام الدراسي 2025-2026

اسم المقرر: Optical Communication Systems

رمز المقرر (ان وجد):

اسم التدريسي: د. عبدالوهاب عيسى

المرحلة: الرابعة

وصف المقرر نظم الاتصالات البصرية [Optical Communication Systems]

يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنأ عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ولابد من الربط بينها وبين وصف البرنامج

1. المؤسسة التعليمية	كلية العراق الجامعة
2. القسم العلمي / المركز	هندسة الاتصالات
3. اسم / رمز المقرر	Optical Communication
4. أشكال الحضور المتاحة	دوام يومي رسمي
5. الفصل / السنة	الثاني
6. عدد الساعات الدراسية (الكلية)	ساعتان نظري وساعة مناقشة
7. تاريخ إعداد هذا الوصف	2019-12-1
8. أهداف المقرر	To study the development of lightwave systems, ray transmission theory, modes theory for optical fiber, fiber optic type. Transmission characteristic of optical fibers, optical sources and fiber optic transmitters.

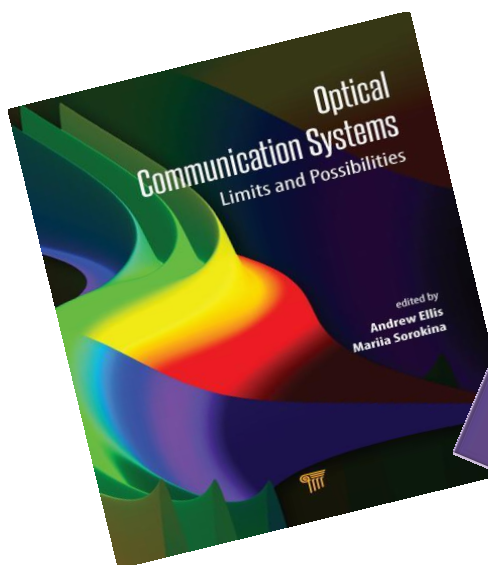
9. مخرجات المقرر وطرائق التعليم والتعلم والتقييم

أ- المعرفة والفهم 1- تعريف الطالب على المفاهيم الاساسية للاتصالات البصرية 2- ادراك الاساس النظري لاتصالات البصرية ب - المهارات الخاصة بالمقرر. 1- اكتساب المهارات وامكانيات 2- توظيف قدرات الطالب ج- مهارات التفكير ج - 1 القدرة على التفكير في حل المسائل الخاصة بمادة الاتصالات البصرية ج - 2 تنمية قدرة الطالب على التعامل مع أنظمة الاتصالات البصرية د - المهارات العامة والمنقولة (المهارات الأخرى المتعلقة بقابلية التوظيف والتطور الشخصي).
طرائق التعليم والتعلم - المحاضرات الصفية الاسبوعية - اكتساب المعرفة من خلال المصادر الخارجية والانترنت - طرح الافكار للمناقشة والحوار وتحفيز الطالب لاكتساب العلوم بشكل ذاتي
طرائق التقييم - امتحان فصلي عدد 2 - امتحان يومي غير منتظم بتوقيات يهدف لتحفيز الطالب على المتابعة - المشاركة اليومية التي تعكس التقييم اليومي للطالب



10. بنية المقرر	
Week	Syllabus
1	Introduction Historical development of lightwave systems Advantages of optical fiber communication
2	Ray Transmission Theory Total internal reflection Acceptance angle Numerical Aperture Optical Ray Types
3	Modes Theory for Optical fiber Normalized Frequency (V number) Number of Modes (M) Cutoff Wavelength
4	Optical Fiber Types Step Index Fibers Graded Index Fibers Single Mode Fibers
5	Solving Examples and problems
6	Transmission Characteristics Attenuation Material Absorption Losses in Silica Glass Fiber Linear Scattering Losses Nonlinear Scattering Losses
7	Linear Scattering Losses Rayleigh Scattering Mie Scattering
8	Nonlinear Scattering Losses Stimulated Brillouin Scattering Stimulated Raman Scattering
9	Fiber Bending Loss Dispersion Solving Examples and problems

10	General Characteristics of Optical Sources Light Generating Mechanisms Spontaneous and Stimulated Emissions Direct and Indirect Bandgap Semiconductors
11	Light Emitting Diodes LEDs Surface- Emitting LEDs Edge- Emitting LEDs Lens Coupling to Fiber
12	Laser Diodes Distributed Feedback Lasers Vertical Cavity Surface- Emitting Laser
13	Glass Fiber Lasers Fiber Optic Transmitters Modulation Bandwidth
14	Solving Examples and problems
15	Revision
11. البنية التحتية	
G. Keiser, Optical Fiber Communications, third Edition, 2000.	1- الكتب المقررة المطلوبة
	المراجع الرئيسية (المصادر)





كلية العراق الجامعة
قسم هندسة الاتصالات

استمارة وصف البرنامج الأكاديمي
للعام الدراسي 2025-2026

اسم المقرر: Satellite Communication
رمز المقرر (ان وجد):
اسم التدريسي: م.د. عبدالوهاب عيسى حمزة
المرحلة: الرابعة

وصف المقرر انصالات الاقمار الصناعية [Satellite Communication]

يوفر وصف المقرر هذا إيجازاً مقتضياً لأهم خصائص المقرر ومخرجات التعلم المتوقعة من الطالب تحقيقها مبرهنناً عما إذا كان قد حقق الاستفادة القصوى من فرص التعلم المتاحة. ولابد من الربط بينها وبين وصف البرنامج.

1. المؤسسة التعليمية	كلية العراق الجامعة
2. القسم العلمي / المركز	هندسة الاتصالات
3. اسم / رمز المقرر	Satellite Communication
4. أشكال الحضور المتاحة	دوام يومي رسمي
5. الفصل / السنة	الثاني
6. عدد الساعات الدراسية (الكلي)	ساعتان نظري وساعة مناقشة
7. تاريخ إعداد هذا الوصف	2019-12-1
8. أهداف المقرر لتزويد الطالب بالمعلومات الأساسية عن الاقمار الصناعية .	

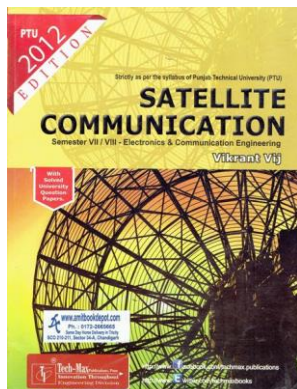
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طرائق التقييم - امتحان فصلي عدد 2 - امتحان يومي غير منتظم بتوقيات يهدف لتحفيز الطالب على المتابعة - المشاركة اليومية التي تعكس التقييم اليومي للطالب

بنية المقرر	
Week	Syllabus
1	Introduction for satellite communication
2	Basic principles
3	Application of satellite, weather forecasting ,radio and TV broadcasting
4	Frequency allocation of satellites
5	Types of satellite based on orbits
6	reviews and exercise
7	الامتحان الفصلي
8	Orbits and launching methods
9	Keplers first laws reviews and exercise
10	Keplers second laws reviews and exercise
11	Satellite design considerations
12	Environmental Conditions
13	VSAT review and installation
14	مراجعة
15	Exam

11. البنية التحتية	
	1- الكتب المقررة المطلوبة
The Satellite Communication Applications Handbook Second Edition· Bruce R. Elbert	المراجع الرئيسية (المصادر)







بسم الله الرحمن الرحيم

