ACADEMIC DESCRIPTION CURRICULUM FOR THE SECOND STAGE (3rd Semester)

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		

Module Title	APPLIED MATHEMATICS	Module Delivery
Module Type	BASIC	☒ Theory ☐ Lecture ☐ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	CoE 201	
ECTS Credits	6	
SWL (hr/sem)	150	

Module Level	UGI- 2	Semester (s) offered	3	
Administering Department	BSc – COMM	College	College of Engineering	
Module Leader		e-mail		
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification	Ph.D	
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Review Committee Approval	10/9/2023	Version Number	1.0	

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mathematics I & Mathematics II	**Semester**	1 & 2
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. Develop problem-solving skills and understand partial differentiation. 2. Understand the chain rule and the total derivative 3. Understand vectors and units, space coordinates, and space vectors. 4. Understand gradient, divergence, and Curl in curved coordinates. 5. Solving linear differential equations of the first and second order with constant coefficients. 6. Understanding Fourier series. 7. To develop problem solving of Eigenvalues and eigenvectors. 8. To understand Fourier, transform and their applications in electrical engineering. 9. To understand Laplace Transforms. To understand the application of Laplace Transforms in the electronic circuits. 10. This course deals with the basic concept of DC electrical circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course is intended for teaching the basic principle of Applied Mathematics for engineering students at the beginning graduate level. The course will have these important outcomes: (1) Recognize differential equations and Partial Differentiation. (2) Summarize the Vectors components. (3) Identify the Multiple Integrals and Double integral and their applications. (4) Identify the Fourier series and their applications. (5) Identify the application in Electrical Circuits. (6) Recognize Eigenvalues and eigenvectors. (7) Summarize series and series geometric. (8) Identify the Laplace Transforms. (9) Identify the Fourier transform their applications.

	(10) Identify the application in Electrical Circuits.
Indicative Contents المحتويات الإرشادية	**Part (A) :** Indicative content includes the following. Differential Equations: Introduction to Differential Equations, 1st and 2nd order linear differential equations with constant coefficients, solution via the auxiliary equation, nonhomogeneous equations, application to electrical systems. Coupled 1st order linear differential equations; transformation of higher order linear differential equations on to coupled differential equations. Homogenous differential of higher order. Vectors: Vectors component and Units, Space coordinate and Space Vector, Scalar Product and Vector Product, Units and plane equation, equations of lines and planes, Product of Three Vectors, Applications. Vector Functions and Their Derivatives Gradient of Scalar Reid; Divergence of Vector Field; Curl of Vector Field; Directional Derivatives; Gradient, Divergence and Curl in Curvilinear Coordinates. Fourier series: The need for Fourier series, Periodic functions, Fourier Series-Euler formulas. Even and odd functions, Half-Range expansions, Application in Electrical Eng. The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. **Part (B) :** Indicative content includes the following. Eigenvalues and eigenvectors; diagonalization. Sequence and series, sequence convergence, series geometric series, nth partial sum, test of convergence. Fourier transform for different functions (unit step function, unit impulse function, singularity function, applications in electrical engineering. Fourier transform for different functions (unit step function, unit impulse function, singularity function, applications in electrical engineering. Laplace Transforms: Introduction to transforms and operators, Laplace transforms of basic functions; unit step function, transforms of 1st and 2nd derivatives, Application to electric circuits; Transforms of piecewise continuous functions Inverse Laplace transforms, derivation using partial fractions. Direct (s-domain) analysis of electrical circuits, Interpretation of s-domain functions Initial & final value theorems.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students.

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College of Engineering**
Department of Communications Engineering

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					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	3,6,11,14	LO #1, 5, 8 and 9
	Assignments	3	10% (10)	2 and 12	LO #1, 2, 4, 6 7, 8 and 9
	Projects / Lab.	3	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #1, #9 and #10,11
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

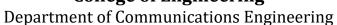|	Delivery Plan (Weekly Syllabus)
	المنهاج الاسبوعي النظري
	Material Covered
Week 1	Introduction to Differential Equations, 1st and 2nd order linear differential equations with constant coefficients, homogeneous equations.
Week 2	Application to electrical systems. Coupled 1st order linear differential equations.
Week 3	Transformation of higher order linear differential equations on to coupled differential equations. Homogenous differential of higher. Solution via the auxiliary equation, nonhomogeneous equations.
Week 4	Vectors component and Units, Space coordinate and Space Vector, Scalar Product and Vector Product. Units and plane equation, equations of lines and planes.
Week 5	Product of Three Vectors, Applications, dot and cross product. Vector Functions and Their Derivatives Gradient of Scalar Reid. Divergence of Vector Field; Curl of Vector Field; Directional Derivatives. Gradient, Divergence and Curl in Curvilinear Coordinates
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	Fourier series: The need for Fourier series, Periodic functions, Fourier Series-Euler formulas. Even and odd functions, Half-Range expansions, Application in Electrical Eng. Multiple Integrals: Double integral, Areas and volume, Double integral polar coordinates
Week 8	**Mid-term Exam**.
Week 9	Sequence and series, sequence convergence. Series geometric series, nth partial sum, test of convergence. Taylor and Mandarin series.
Week 10	Introduction to transforms and operators, Laplace Transforms. Laplace transforms of basic functions. unit step function, transforms of 1st and 2nd derivatives.
Week 11	Direct (s-domain) analysis of electrical circuits, Interpretation of s-domain functions Initial & final value theorems.
Week 12	Inverse Laplace transforms. Application to electric circuits.
Week 13	Derivation using partial fractions. Transforms of piecewise continuous functions
Week 14	Fourier transform: Introduction, Fourier transform equation, properties.
Week 15	Fourier transform for different functions (unit step function, unit impulse function, singularity function, applications in electrical engineering).

Week 16	Preparatory week before the final Exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Engineering Circuit Analysis 7th Edition by William Hayt , Jack Kemmerly , Steven Durbin.	Yes
Recommended Texts	Schaum's Outline of Basic Circuit Analysis, Second Edition (Schaum's Outlines) 2nd Edition, by John O'Malley	No
Websites	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2017 .	

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.

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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 ☐ Seminar
Module Code	DOC 201	
ECTS Credits	6	
SWL (hr/sem)	150	

Module Level	UGI- 2	Semester (s) offered	3
Administering Department	BSc – COMM	College	College of Engineering
Module Leader		e-mail	
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification	Ph.D
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Review Committee Approval	10/9/2023	Version Number	1.0

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

Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills of coordinate systems through the understanding the rectangular coordinate system, cylindrical coordinate system, spherical coordinate system. 2. To understand the vector analysis (scalars and vectors). 3. This course deals with the basic concept of the Electric Field Intensity, Electric Flux Density, magnetic Field Intensity, and magnetic Flux Density. 4. To understand the Energy and Potential. 5. To understand the electric fields in material space. Conductors, dielectrics, and capacitance. 6. To perform the electric fields due to continuous charge distributions. 7. To understand the magnetic field due to different current distributions. 8. To understand different laws such as Coulomb's Law, Gauss's Law, Biot Savart's Law, Ampere's Law, and Faraday's Law.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course is intended for teaching the basic principle of Electromagnetic Fields I for engineering students at the beginning graduate level. The course will have these important outcomes: (1) To develop problem solving skills of coordinate systems through the understanding the rectangular coordinate system, cylindrical coordinate system, spherical coordinate system. (2) To understand the vector analysis (scalars and vectors). (3) This course deals with the basic concept of the Electric Field Intensity, Electric Flux Density, magnetic Field Intensity, and magnetic Flux Density. (4) To understand the Energy and Potential. (5) To understand the electric fields in material space. conductors, dielectrics, and capacitance. (6) To perform the electric fields due to continuous charge distributions. (7) To understand the magnetic field due to different current distributions. (8) To understand different laws such as Coulomb's Law, Gauss's Law, Biot Savart's Law, Ampere's Law, and Faraday's Law.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A -** Coordinate systems and Vector analysis coordinate systems: rectangular coordinate system, cylindrical coordinate system, spherical coordinate system. vector analysis: scalars and vectors, vector algebra, vector components and unit vectors, vector addition and subtraction, vector multiplication. coulomb's law and electric force: the experimental law of coulomb. Magneto-statics: the static magnetic fields, biot-savart law. Magneto-statics: magnetic field due to different current distributions,

right-hand rule. Magneto-statics: solenoid, applications of solenoid, toroid. [12 hrs.] Revision problem and tutorial classes [4 hrs.]. Quizzes [1 hr.].

Part B- Electric field intensity and Charge distributions electric field intensity: electric field of a point charge, electric field of n point charges. Electric fields due to continuous charge distributions: electric field of a line charge. Electric fields due to continuous charge distributions: electric field of a sheet of charge. Electric fields due to continuous charge distributions: electric field of a volume of charge. Magneto-statics: ampere's circuital law, applications of ampere's law: infinite line current, infinite sheet of current, infinitely long coaxial transmission line. Magneto-statics: magnetic flux and magnetic flux density. Inductance: inductance of a conductor, inductance of toroid. [12 hrs.]. Revision problem and tutorial classes [4 hrs.]
Quizzes [1 hr.]

Part C- Electric flux density and Gauss's law application Electric flux density and gauss's law: gauss's law application on a point charge, gauss's law application on a line charge. Electric flux density and gauss's law: gauss's law application on a surface charge. Electric flux density and gauss's law: gauss's law application on a volume charge. Work, potential & potential difference: work done in moving a point charge. work, potential & potential difference: potential & potential difference. Force on a moving charge. Magnetic forces, work & power: work. Magnetic forces, work & power: power. Time varying fields: faraday's law. time varying fields: induced electromotive force. [9 hrs.] Revision problem and tutorial classes [3 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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL)
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.8

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Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150

<table>
<tr><td colspan="5" align="center">**Module Evaluation**
تقييم المادة الدراسية</td></tr>
<tr><td></td><td></td><td>Time/Number</td><td>Weight (Marks)</td><td>Week Due</td><td>Relevant Learning Outcome</td></tr>
<tr><td rowspan="4">**Formative assessment**</td><td>**Quizzes**</td><td>2</td><td>10% (10)</td><td>4,8,14</td><td>LO #1, 4, 6 and 7</td></tr>
<tr><td>**Assignments**</td><td>3</td><td>10% (10)</td><td>2 to 13</td><td>LO #1, 2, 3, 4, 5 and 7</td></tr>
<tr><td>**Projects.**</td><td>3</td><td>10% (10)</td><td>Continuous</td><td>All</td></tr>
<tr><td>**Report**</td><td>1</td><td>10% (10)</td><td>5 to 14</td><td>LO #1 to #8</td></tr>
<tr><td rowspan="2">**Summative assessment**</td><td>**Midterm Exam**</td><td>2hr</td><td>10% (10)</td><td>7</td><td>LO #1 - #7</td></tr>
<tr><td>**Final Exam**</td><td>3hr</td><td>50% (50)</td><td>16</td><td>All</td></tr>
<tr><td colspan="3">**Total assessment**</td><td>100% (100 Marks)</td><td></td><td></td></tr>
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<table>
<tr><td colspan="2" align="center">**Delivery Plan (Weekly Syllabus)**
المنهاج الاسبوعي النظري</td></tr>
<tr><td></td><td>**Material Covered**</td></tr>
<tr><td>**Week 1**</td><td>Coordinate systems: rectangular coordinate system, cylindrical coordinate system, spherical coordinate system.</td></tr>
<tr><td>**Week 2**</td><td>Vector analysis: scalars and vectors. Vector analysis: vector algebra, vector components and unit vectors, vector addition and subtraction.</td></tr>
<tr><td>**Week 3**</td><td>Vector multiplication. Coulomb's law and electric force: the experimental law of coulomb. Electric field intensity: electric field of a point charge, electric field of n point charges.</td></tr>
<tr><td>**Week 4**</td><td>Electric fields due to continuous charge distributions: electric field of a line charge. Electric field of a volume of charge.</td></tr>
<tr><td>**Week 5**</td><td>Electric flux density and gauss's law: gauss's law application on a surface charge.</td></tr>
<tr><td>**Week 6**</td><td>Electric flux density and gauss's law: gauss's law application on a volume charge. Work, potential & potential difference: work done in moving a point charge.</td></tr>
<tr><td>**Week 7**</td><td>Work, potential & potential difference: potential & potential difference. Conductors,</td></tr>
</table>

	dielectrics, and capacitance: electric fields in material space. Conductors, dielectrics, and capacitance.
Week 8	**Mid-term Exam**.
Week 9	Dielectric – dielectric boundary conditions, conductor – dielectric boundary conditions, conductor – free space boundary conditions.
Week 10	Conductors, dielectrics, and capacitance: capacitance and capacitors. Magneto-statics: magnetic flux and magnetic flux density. inductance: inductance of a conductor, inductance of toroid
Week 11	Magneto-statics: the static magnetic fields, biot-savart law. Magnetic field due to different current distributions. Right-hand rule.
Week 12	Solenoid, applications of solenoid, toroid. Ampere's circuital law, applications of ampere's law.
Week 13	Magnetic forces, work & power: force on a moving charge. Work and power.
Week 14	Magnetic forces, work & power: power. Time varying fields: faraday's law. Time varying fields: induced electromotive force.
Week 15	Applications of ampere's law: infinite line current, infinite sheet of current. infinitely long coaxial transmission line
Week 16	**Preparatory week before the final Exam**

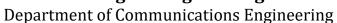| **Learning and Teaching Resources** مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Johnk, Carl Theodore Adolf. "Engineering electromagnetic fields and waves." New York (1975).	Yes
Recommended Texts	Rojansky, Vladimir Borisovich, and Vladimir Rojansky. Electromagnetic fields and Waves. Courier Corporation, 1979. (can be downloaded from the Course web page/classroom).	No
Websites	Nefyodov, Eugene I., and Sergey Smolskiy. Electromagnetic fields and waves. Springer, 2019	

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.

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College of Engineering
Department of Communications Engineering

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		

Module Title	ELECTRONICS I	Module Delivery
Module Type	CORE	☒ Theory
Module Code	**DOC 203**	☐ Lecture
ECTS Credits	8	☒ Lab
SWL (hr/sem)	200	☒ Tutorial ☐ Practical ☐ Seminar

Module Level	UGI- 2	Semester (s) offered		3
Administering Department	BSc – COMM	**College**	College of Engineering	
Module Leader		**e-mail**		
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	Ph.D	
Module Tutor		**e-mail**		
Peer Reviewer Name		**e-mail**		
Review Committee Approval	10/9/2023	**Version Number**	1.0	

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

| **Module Objectives**
أهداف المادة الدراسية | 1. To develop problem solving skills of electronic circuit through the understanding solid state for each electronic passive and active elements such as RLC, diodes, transistors, and integrated circuits.
2. To understand the Basic Transistor Construction through graphical analysis of transistors Connections and biasing.
3. This course deals with the basic concept of the small-signal analysis of the transistors such as D.C. and A.C. Equivalent Circuits.
4. To understand the Load Line Analysis, Operating Point Transistor Parameters, and Rating Amplification Stabilization.
5. To understand the H-parameters, Hybrid Equivalent Circuit. Z-parameters, R parameters Equivalent Circuit.
6. To perform current-voltage characteristics, charge control description for all types of both the diode and transistors.
7. To Describe and operation of the Multistage Transistor Amplifiers.
8. To develop problem solving skills of electronic circuit through the understanding solid state for each electronic passive and active elements such as operational amplifiers and its types.
9. To understand Basic Differential Amplifier and its applications.
10. This course deals with the basic concept of the Frequency Response of the amplifier as a single stage and multistage Amplifiers.
11. To understand the application of the amplifiers such as integrator, summer.
12. To understand the A/D convertor and D/A convertor circuits.
13. To perform frequency Response of the Amplifiers using BJT and FET transistor.
14 . To Describe and operation of Logarithmic amplifier Analog computer circuit |
| **Module Learning Outcomes**

مخرجات التعلم للمادة الدراسية | This course is intended for teaching the basic principle of Electronics I for engineering students at the beginning graduate level. The course will have these important outcomes:
(1) Recognize the regions of operation, graphical analysis of BJT, regions of operation stability.
(2) List the various terms associated with bias configuration of the transistors.
(3) Summarize what is meant of the practical circuit of transistor amplifier.
(4) Describe the types of multistage amplifiers. |

	(5) Discuss the various properties of transistors used as an amplifier
	(6) Explain the transistor construction and operation such as amplifier and switching.
	(7) Explain the operation of the linear amplifier through the a.c. load line and DC load line analysis.
	(8) Recognize the types of the operational amplifiers and frequency response of the amplifiers.
	(9) List the various terms associated with all active electronics devices.
	(10) Summarize what is meant by an active electronic device such as operational amplifiers, Differential Amplifier, and Logarithmic amplifier.
	(11) Describe the types of the Amplifier (integrator, summer, differentiator …).
	(12) Discuss the various properties of Differential Amplifier and its applications.
	(13) Explain the analog computer circuits.
	(14) Explain the operation of the A/D convertor and D/A convertor circuits.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: **Part A -** Transistor Construction, Operation, and Stabilization Transistor Construction. Transistor Symbols. Transistor Operation. Transistor Connections: Common Base CB Connection, Common Emitter CE Connection, Transistor Curves, Cutoff and Saturation. Transistor as a switch. Common Collector Connection. Transistor Load Line Analysis, Operating Point, Transistor Parameters and Rating Amplification. [15 hrs.] Revision problem and tutorial classes [5 hrs.] Quizzes [1 hr.]. **Part B**- D.C and A.C Equivalent Circuits of the transistors Practical Circuit of Transistor Amplifier, D.C. and A.C. Equivalent Circuits. Transistor ac Equivalent Circuits h-parameters, Hybrid Equivalent Circuit. The Linear Amplifier. [15 hrs.] Revision problem and tutorial classes [5 hrs.]. Quizzes [1 hr.] **Part C-** Transistor Bias Configuration and Multistage Transistor Amplifiers. The a.c. Load Line, A.C. Analysis Using re Model for Transistor Common Emitter Fixed Bias Configuration, Common-Emitter Emitter Bias Configuration, Common – Emitter Collector Feedback Configuration, Common – Emitter Voltage Divider Configuration. The Common – Collector Amplifier, the Common – Base Amplifier. Multistage Transistor Amplifiers. [15 hrs.] Revision problem and tutorial classes [5 hrs.]. Quizzes [1 hr.]. **Part D-** Frequency Response of the Amplifiers Frequency Response of single stage and Multistage Amplifiers used as a BJT transistors and FET. Differential Amplifier, and Differential Amplifier Applications. [15 hrs.] Revision problem and tutorial classes [5 hrs.] Quizzes [1 hr.] **Part E-** Operational amplifiers and its types Operational amplifiers and its types, Operation amplifier internal circuits, Inverting amplifiers non-inverting amplifiers, Differentiator and integrator circuits. [15 hrs.] Revision problem and tutorial classes [5 hrs.] Quizzes [1 hr.]

	Part F- A/D and D/A convertor circuit and active filter design A/D convertor and D/A convertor. Logarithmic amplifier. Analog computer circuit. Passive filter design. Active filter design and its applications. [15 hrs.] Revision problem and tutorial classes [5 hrs.] Quizzes [1 hr.]

Learning and Teaching Strategies
استراتيجيات التعلم والتعلم

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

Student Workload (SWL)
الحمل الدراسي للطالب 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
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	4,8,14	LO #1, 4, 6 and 13
	Assignments	3	10% (10)	2 to 13	LO #1, 2, 3, 4, 5 and 14
	Projects.	3	10% (10)	Continuous	All
	Report/ Lab	5 - 1	10% (10)	5 to 14	LO #1 to #8
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #8
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Transistor Construction. Transistor Symbols. Transistor Operation. Transistor Connections: Common Base CB Connection, Common Emitter CE Connection.
Week 2	Transistor Curves, Cutoff and Saturation. Transistor as a switch. Common Collector Connection. Transistor Load Line Analysis, Operating Point.
Week 3	Transistor Parameters and Rating Amplification. Practical Circuit of Transistor Amplifier.
Week 4	D.C. and A.C. Equivalent Circuits. Transistor ac Equivalent Circuits. Transistor ac Equivalent Circuits h-parameters, Hybrid Equivalent Circuit. Transistor ac Equivalent Circuits.
Week 5	The Linear Amplifier. The a.c. Load Line, A.C. Analysis Using re Model for Transistor Common Emitter Fixed Bias Configuration. The a.c. Load Line, A.C. Analysis Using re Model for Transistor Common – Emitter.
Week 6	Emitter – Bias Configuration, Common – Emitter Collector Feedback Configuration. The a.c. Load Line, A.C. Analysis Using re Model for Transistor Common – Emitter Voltage Divider Configuration.
Week 7	The Common – Collector Amplifier, the Common – Base Amplifier. Multistage Transistor Amplifiers

Week 8	Mid-term Exam.
Week 9	Frequency Response of the single stage amplifier using BJT transistors. Frequency Response of the single stage amplifier using FET transistors.
Week 10	Frequency Response of Multistage Amplifiers using BJT transistors. Frequency Response of Multistage Amplifiers using FET transistors.
Week 11	Basics of Operational amplifiers. Operational amplifiers and its types. Operational amplifiers and its applications.
Week 12	Characteristics of the Operational amplifiers. Basics of the Differential Amplifier. Differential Amplifier Applications.
Week 13	A/D convertor circuit and its types and applications. D/A convertor circuit and its types and applications. Passive filter and active filter design.
Week 14	Passive filter and active filter design.
Week 15	Logarithmic amplifiers. Analog computer circuits.
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to lab. components
Week 2	Lab 2: Study of I-V characteristics of normal diode & Zener diode
Week 3	Lab 3: Diode application I: Rectifier filters
Week 4	Lab 4: Diode application II: Clipping circuits
Week 5	Lab 5: Diode application III: clamping circuits
Week 6	Lab 6: Transistor Connections: Common Base CB Connection, Common Emitter CE Connection
Week 7	Lab 7: Transistor Curves, Cutoff and Saturation. Transistor as a switch. Common Collector Connection
Week 8	Lab 8: D.C. and A.C. Equivalent Circuits. Transistor ac Equivalent Circuits. The a.c. Load Line, A.C. Analysis Using re Model for Transistor Common – Emitter Voltage Divider Configuration
Week 9	Lab 9: The Common – Collector Amplifier, the Common – Base Amplifier.

Week 10	Lab 10: Frequency Response of the single stage amplifier using BJT transistors
Week 11	Lab 11: Basics of Operational amplifiers. Operational amplifiers and its types. Characteristics of the Operational amplifiers.
Week 12	Lab 12: Basics of the Differential Amplifier. Differential Amplifier Applications
Week 13	Lab 13: A/D convertor circuit and its types and applications. D/A convertor circuit and its types and applications.
Week 14	Lab 14: Passive filter and active filter design. Logarithmic amplifiers. Analog computer circuits.
Week 15	**Final Exam**

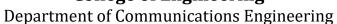| Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Floyd, Thomas L. Electronics Fundamentals: Circuits, Devices and Applications (Floyd Electronics Fundamentals Series). Prentice-Hall, Inc., 2006.	Yes
Recommended Texts	Donald A. Neamen. (2003). "SEMICONDUCTOR PHYSICS AND DEVICES". 3rd Edition, ISBN 0-07-232107-05, USA. (can be downloaded from the Course web page/classroom).	No
Websites	Nashelsky, L., & Boylestad, R. L. (2021). Electronic Devices and Circuit Theory Eleventh Edition	

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.

Ministry of Higher Education and
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MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

<table>
<tr><td colspan="4" align="center">Module Information
معلومات المادة الدراسية</td></tr>
<tr><td>Module Title</td><td colspan="2">PROBABILITY AND RANDOM PROCESSES</td><td>Module Delivery</td></tr>
<tr><td>Module Type</td><td colspan="2">BASIC</td><td rowspan="4">☒ Theory
☐ Lecture
☐ Lab
☒ Tutorial
☐ Practical
☐ Seminar</td></tr>
<tr><td>Module Code</td><td colspan="2">DOC 205</td></tr>
<tr><td>ECTS Credits</td><td colspan="2">4</td></tr>
<tr><td>SWL (hr/sem)</td><td colspan="2">100</td></tr>
<tr><td>Module Level</td><td>UGI- 2</td><td>Semester (s) offered</td><td>3</td></tr>
<tr><td>Administering Department</td><td>BSc – COMM</td><td>College</td><td>College of Engineering</td></tr>
<tr><td>Module Leader</td><td></td><td>e-mail</td><td></td></tr>
<tr><td>Module Leader's Acad. Title</td><td>Assist. Prof.</td><td>Module Leader's Qualification</td><td>Ph.D</td></tr>
<tr><td>Module Tutor</td><td></td><td>e-mail</td><td></td></tr>
<tr><td>Peer Reviewer Name</td><td></td><td>e-mail</td><td></td></tr>
<tr><td>Review Committee Approval</td><td>10/9/2023</td><td>Version Number</td><td>1.0</td></tr>
</table>

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

Module Objectives أهداف المادة الدراسية	1) To teach you the fundamentals of probability theory (probabilistic models, discrete and continuous random variables, multiple random variables, etc). 2) To develop your ability to apply probability theory to real life problems, especially in the field of computer engineering. 3) To teach you some advanced topics (transforms, sums of random variables, random processes, etc). 4) To introduce you to simulation models. 5) Knowledge of basic concept of set theory, probability, and random variables with main distribution functions. 6) Distinguish between single and multiple random variables and to deal with their density and distribution functions 7) Deal with the statistical properties of the random processes or signals. 8) Develop a strong foundation in probability theory and stochastic processes. Understand the role of random variables and their distributions in communication systems. 9) Apply probabilistic models to solve practical problems in communication engineering. Analyze and interpret the performance of communication systems using probabilistic techniques. 10) Equip students with the skills necessary to model and simulate random processes in communication systems.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course is intended for teaching Probability and Random Operations for engineering students at the beginning graduate level. The course will have these important outcomes: **By the end of this module, students will be able to:** 1) Define and Explain key concepts of probability theory, including random variables, probability distributions, expectation, and variance. 2) Apply probabilistic models to analyze the behavior of communication systems under uncertainty. 3) Interpret the performance metrics of communication systems using probability and stochastic process theories. 4) Model random processes and noise in communication systems and assess their impact on system performance.

	4) Simulate random processes and communication systems using appropriate software tools.
	5) Evaluate the reliability and efficiency of communication systems using probabilistic methods.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: **Part A:** Introduction to Probability Theory: Basic concepts: sample space, events, and probability axioms. Conditional probability and independence. Bayes' theorem and its applications. Random Variables and Distributions: Definition and types of random variables: discrete and continuous. Probability mass function (PMF) and probability density function (PDF). Cumulative distribution function (CDF). Expectation and Moments: Expected value, variance, and higher-order moments. Moment generating functions. Applications in communication systems. Multiple Random Variables: Joint, marginal, and conditional distributions. Covariance and correlation. Central limit theorem and its implications. Stochastic Processes: Definition and classification of stochastic processes. Stationarity and ergodicity. Markov processes and their properties. [15 hrs.] Revision problem and tutorial classes [5 hrs.] Quizzes [1 hr.]

Part B: Noise Models in Communication Systems: Gaussian processes and white noise. Signal-to-noise ratio (SNR) and its importance. Modeling and simulation of noise in communication systems. Random Processes in Communication Engineering: Random processes in time and frequency domains. Spectral density and its estimation. Applications in modulation and demodulation techniques. Performance Analysis of Communication Systems: Error probability and bit error rate (BER) analysis. Channel capacity and information theory basics. Impact of fading and multipath on communication systems. Simulation Techniques: Monte Carlo simulations. Use of software tools such as MATLAB or Python for simulating random processes and communication systems. Case studies and practical examples. Introduction to queueing theory and its applications. Detection and estimation theory. Applications of probability theory in modern communication technologies (e.g., wireless communications, networks). Revision problem and tutorial classes [5 hrs.] Quizzes [1 hr.]

Part C- 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. Renewal processes. Queues. The Wiener process. Existence of processes. Stationary processes. |

	Linear prediction. Auto covariances and spectra. Stochastic integration and the spectral representation. The ergodic theorem. Gaussian processes [15 hrs.] Revision problem and tutorial classes [5 hrs.] Quizzes [1 hr.]

Learning and Teaching Strategies
استراتيجيات التعلم والتعلم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, The module "Probability and Random Operations in Communication Engineering" aims to provide students with a comprehensive understanding of probability theory and its application in the field of communication engineering. The course will cover fundamental concepts and methods used in analyzing and designing communication systems that operate in the presence of uncertainty and noise.

Student Workload (SWL)			
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.46
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	10% (10)	4,8,14	LO #1, 4, 6 and 9
	Assignments	3	10% (10)	2 to 13	LO #1, 2, 3, 4, 5 and 10
	Projects.	3	10% (10)	Continuous	All
	Report	1	10% (10)	5 to 14	LO #1 to #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)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Probability: (Introduction, Set definitions and operations), Joint and conditional Probability, Bayes' Theorem, Independent events). Introduction to Statistics and role of probability. Sampling Procedures and Collection of data. Data Analysis. Permutation and combination
Week 2	Discreet and Continues Sample Space. Probability Theory and Experiments, Permutation and Combination. The Random Variable :(The Random variable concept, Discrete and continuous random variables).
Week 3	Probability distribution; Raw Data, Frequency Distribution Histogram, Frequency Polygons, Relative Frequency Distribution. Cumulative Frequency Distribution, O gives , Frequency Curve. The mean, median, mode, geometric mean, harmonic mean, RMS, mean square value.
Week 4	Measures of dispersion; the mean deviation, the standard deviation and variance. Relations between frequency distribution and mean, media, medium.
Week 5	Elementary prob. Theory, axioms of probability joint prob. Random Experiment independent and mutually exclusive events. Conditional probability. The binary symmetric channel example. Total probability, repeated (Bernoulli) trials.

Week 6	Random variables. Discrete and Continuous Random variable. Prob. density function (pdf) and cumulative distribution function (cdf). Mixed random variables, Probability density function. Discrete Distributions & Continuous Distributions.
Week 7	The expectations of discrete and continuous random variables. Some important distributions; the uniform distribution, the binomial and Poisson distributions.
Week 8	**Mid-term Exam**.
Week 9	Normal (Gaussian) distribution; Q Function and its applications. Statistics of Random Variables: (Expectation, Moments, Transformations of a random variable). Multiple Random Variables & Operations on Multiple Random Variables:
Week 10	Random Processes:(Deterministic and nondeterministic processes Correlation functions), Operation, Characteristics,
Week 11	Functions of random variables and their expectations. Summation of random variables, Transformation of random variables
Week 12	Spectral Characteristics of Random Processes: (Power spectral density)
Week 13	Autocorrelation function, (White and colored noise), Joint random variables; joint pdf, joint cdf, joint moments and expectations.
Week 14	(Vector random variables, Joint density and distribution functions, Statistical independence, Central limit theorem, multiple random variables)
Week 15	Mixed random variables, Probability density function. Discrete Distributions & Continuous Distributions.
Week 16	**Preparatory week before the final Exam**

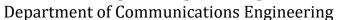| **Learning and Teaching Resources**		
مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Probability & Statistics for Engineers and Scientists Author : Walpole & Myers Edition & Year public: 8th , 2007 , Pearson Prentice Hall H. Pishro-Nik, "Introduction to probability, statistics, and random processes". Leon-Garcia, A. (2008). Probability, Statistics, and Random Processes For Electrical Engineering. Pearson/Prentice Hall.	Yes

	Papoulis, A., & Pillai, S. U. (2002). Probability, Random Variables, and Stochastic Processes. McGraw-Hill.	
Recommended Texts	"Probability, Random Variables, and Random Signal Principles", Peyton Z. Peebles, 4th edition, McGraw-Hill, Inc, 2001. Stark, H., & Woods, J. W. (2012). Probability and Random Processes with Applications to Signal Processing. Pearson. Proakis, J. G., & Salehi, M. (2007). Digital Communications. McGraw-Hill.	No
Websites	https://www.probabilitycourse.com, Kappa Research LLC, 2014	

<table>
<tr><th colspan="5">Grading Scheme
مخطط الدرجات</th></tr>
<tr><th>Group</th><th>Grade</th><th>التقدير</th><th>Marks %</th><th>Definition</th></tr>
<tr><td rowspan="5">Success Group (50 - 100)</td><td>A - Excellent</td><td>امتياز</td><td>90 - 100</td><td>Outstanding Performance</td></tr>
<tr><td>B - Very Good</td><td>جيد جدا</td><td>80 - 89</td><td>Above average with some errors</td></tr>
<tr><td>C - Good</td><td>جيد</td><td>70 - 79</td><td>Sound work with notable errors</td></tr>
<tr><td>D - Satisfactory</td><td>متوسط</td><td>60 - 69</td><td>Fair but with major shortcomings</td></tr>
<tr><td>E - Sufficient</td><td>مقبول</td><td>50 - 59</td><td>Work meets minimum criteria</td></tr>
<tr><td rowspan="2">Fail Group (0 – 49)</td><td>FX – Fail</td><td>راسب (قيد المعالجة)</td><td>(45-49)</td><td>More work required but credit awarded</td></tr>
<tr><td>F – Fail</td><td>راسب</td><td>(0-44)</td><td>Considerable amount of work required</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
</table>

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.

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

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information	
معلومات المادة الدراسية	

Module Title	SIGNALS AND SYSTEMS	Module Delivery	
Module Type	CORE	☒ Theory	
Module Code	**DOC 206**	☐ Lecture ☒ Lab	
ECTS Credits	4	☐ Tutorial	
SWL (hr/sem)	100	☐ Practical ☐ Seminar	

Module Level	UGI- 2	Semester (s) offered	3
Administering Department	BSc – COMM	College	College of Engineering
Module Leader		e-mail	
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification	Ph.D
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Review Committee Approval	10/9/2023	Version Number	1.0

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

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

Module Objectives أهداف المادة الدراسية	1) The aim of this module is to provide students with a solid foundation in the principles and techniques of signals and systems, which are fundamental to the field of communication engineering. 2) Students will learn to analyze and process signals, understand system behavior, and apply these concepts to real-world communication systems. 3) This course aims to introduce the basic concepts and techniques used in signal processing domain which plays an important role in a wide variety of engineering systems. 4) The study of Linear Time-Invariant systems (LTI) in the continuous-time domain as well as in the discrete-time domain. 5) The students understand the transition between the continuous-time domain and the discrete-time domain through the sampling theory. 6) The students use the basic tools used in signal processing such as Fourier Transform, Laplace Transform, and Z-Transform. Although these tools have mathematical nature, they use MATLAB in practice Lab for simulation.

Module Learning Outcomes
 	
مخرجات التعلم للمادة الدراسية
	This course is intended for Signals and Systems in Communication Engineering for engineering students at the beginning graduate level. The course will have these important outcomes: **By the end of this module, students will be able to:**
	
	  1) Understand Basic Concepts: Define and classify different types of signals (continuous and discrete) and systems (linear, time-invariant, etc.), including their properties and representations.
	
	  2) Analyze Time-Domain Systems: Perform convolution and analyze systems using impulse response and differential/difference equations.
	
	  3) Frequency-Domain Analysis: Understand and apply Fourier series, Fourier transform, Laplace transform, and Z-transform to analyze signals and systems.
	
	  4) Filter Design and Applications: Design and analyze different types of filters (low-pass, high-pass, band-pass, and band-stop) and understand their applications in communication systems.
	
	  5) Sampling and Reconstruction: Understand the sampling theorem, aliasing, and methods for reconstructing signals from samples.
	
	  6) Modulation and Demodulation: Comprehend the principles of various modulation schemes and their role in communication systems.
	
	  7) Random Processes: Analyze random processes and understand their significance in communication systems.

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	8) Develop students' proficiency in using MATLAB for numerical computations, data analysis, and visualization. Enable students to apply MATLAB skills to solve real-world problems in various disciplines.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following:** **Part A:** Understand Basic Concepts: Define and classify different types of signals and systems, including their properties and representations. Analyze Time-Domain Systems: Perform convolution and analyze systems using impulse response and exponential response. Understand the representation of signals and systems and their classifications. Describe the linear time-invariant systems and their properties and the input-output relation. [15 hrs.] Revision problem and tutorial classes [5 hrs.] Quizzes [1 hr.] **Part B:** Apply Fourier Transform for continuous signals and its properties. Apply Laplace transform and its use in the study of continuous LTI systems. Understand the concepts of Sampling and related theorem, and continuous signal recovery from sampled signal. Describe discrete-time signals and systems and the input-output relation. Identify Fourier Transform for discrete and its relation to continuous Fourier Transform. Apply Z-Transform for discrete time LTI systems. Understand the Discrete Fourier Transform and its relation to Fourier Transform of discrete signals. Describe some practical filters using Fourier and Laplace Transforms. [15 hrs.] Revision problem and tutorial classes [5 hrs.] Quizzes [1 hr.] **Part C:** Demonstrate a solid understanding of the MATLAB environment and its basic Functionalities. Perform simple calculations, create arrays and matrices, and apply elementwise operations. Generate 2D and 3D plots, including multiple plots in a single figure and plots with error bars. Apply sorting algorithms and effectively work with files, strings, and cell arrays in MATLAB. Design and implement functions, including handling multiple return values and variable arguments. Apply model-based design principles using Simulink to develop and validate systems. [15 hrs.] Revision problem and tutorial classes [5 hrs.] Quizzes [1 hr.]

Learning and Teaching Strategies	
استراتيجيات التعلم والتعلم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, This module covers the fundamentals of signal and system analysis, focusing on representations of discrete-time and continuous-time signals (singularity functions, complex exponentials and geometrics, Fourier representations, Laplace and Z transforms, sampling) and representations of linear, time-invariant systems (difference and differential equations, block diagrams, system functions, poles and zeros, convolution, impulse and step responses, frequency responses). Applications are drawn broadly from engineering and physics, including feedback and control, communications, and signal processing. Also to make them familiar with different types of transforms of systems. Also to make them have an experience with solving different problems and examples. he learning and teaching strategies employed in this course are designed to facilitate effective comprehension and practical application of MATLAB concepts. The course adopts a blended approach, combining lectures, demonstrations, and hands on exercises to engage participants actively. Lectures provide theoretical knowledge and explanations, while demonstrations illustrate MATLAB functionalities and techniques.

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

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	4,8,14	LO #1, 4 and 6
	Assignments	3	10% (10)	2 to 13	LO #1, 2, 3, 4, 5 and 6
	Projects.	3	10% (10)	Continuous	All
	Report/ Lab	4	10% (10)	5 to 14	LO #1 to #5
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Signals and Systems. Classification of signals: Continuous-time, discrete-time, periodic, aperiodic, energy, and power signals.
Week 2	Basic operations on signals: Scaling, shifting, and inversion. Classification of systems: Linear vs. nonlinear, time-invariant vs. time-varying, causal vs. non-causal, stable vs. unstable.
Week 3	Time-Domain Analysis of Systems. Impulse response and convolution for continuous and discrete systems.
Week 4	Differential and difference equations. Block diagram representation of systems.
Week 5	Fourier Series and Fourier Transform. Representation of periodic signals using Fourier series. Continuous-time Fourier transforms (CTFT) and its properties.
Week 6	Discrete-time Fourier transform (DTFT) and its properties. Applications of Fourier transform in communication systems.
Week 7	Laplace Transform and Z-Transform. Laplace transform: Definition, properties, inverse Laplace transform, and applications. Z-transform: Definition, properties, inverse Z-transform, and applications.

Week 8	**Mid-term Exam**.
Week 9	Analysis of systems using Laplace and Z-transform. Frequency-Domain Analysis. Frequency response of systems. Bode plots and Nyquist plots. Introduction to filter design: Low-pass, high-pass, band-pass, and band-stop filters.
Week 10	Filter specifications and design techniques. Sampling and Reconstruction. Sampling theorem and Nyquist rate. Aliasing and anti-aliasing filters.
Week 11	Reconstruction of continuous-time signals from discrete-time samples. Practical aspects of sampling and reconstruction.
Week 12	Modulation and Demodulation Techniques. Introduction to amplitude modulation (AM), frequency modulation (FM), and phase modulation (PM). Demodulation techniques and their applications in communication systems.
Week 13	Random Processes in Communication Systems. Introduction to random processes. Characterization of random processes: Mean, autocorrelation, and power spectral density.
Week 14	Applications of random processes in noise analysis and signal processing.
Week 15	Introduction to advanced topics such as digital signal processing (DSP), adaptive filters, and modern communication systems.
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to MATLAB. Arrays and Matrices. M-files and Loop Statements
Week 2	Lab 2: 2D and 3D Plots. Sorting. Working with Files.
Week 3	Lab 3: Functions. Modeling and Simulation with Simulink.
Week 4	Lab 4: Introduction to Signals and Systems.
Week 5	Lab 5: Classification of signals: Continuous-time, discrete-time, periodic, aperiodic, energy, and power signals.
Week 6	Lab 6: Basic operations on signals: Scaling, shifting, and inversion.
Week 7	Lab 7: Classification of systems: Linear vs. nonlinear, time-invariant vs. time-varying,
Week 8	Lab 8: Time-Domain Analysis of Systems. Impulse response and convolution for continuous and

	discrete systems.
Week 9	Lab 9: Fourier Series and Fourier Transform. Discrete-time Fourier transform (DTFT) and its properties.
Week 10	Lab 10: Laplace Transform and Z-Transform. Laplace transform.
Week 11	Lab 11: Frequency-Domain Analysis. Frequency response of systems.
Week 12	Lab 12: Introduction to filter design: Low-pass, high-pass, band-pass, and band-stop filters.
Week 13	Lab 13: Sampling and Reconstruction. Sampling theorem and Nyquist rate. Aliasing and anti-aliasing filters.
Week 14	Lab 14: Random Processes in Communication Systems. Introduction to random processes. Characterization of random processes: Mean, autocorrelation, and power spectral density.
Week 15	**Final Exam**

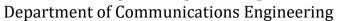| **Learning and Teaching Resources** مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Signals and Systems by Alan V. Oppenheim, Alan S. Willsky, and S. Hamid Nawab. Signals and Systems. Simon S. Haykin Matlab for Beginners – A gentle approach By Peter I. Kattan.	Yes
Recommended Texts	Digital Signal Processing by John G. Proakis and Dimitris K. Manolakis. Attaway, Dorothy C. MATLAB: A practical introduction to programming and problem solving. Butterworth Heinemann, 2018	Yes
Websites	https://matlabacademy.mathworks.com/details/matlab-fundamentals/mlbe	

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.

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

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		

Module Title	**ARABIC LANGUAGE**	Module Delivery
Module Type	BASIC	☒ **Theory**
Module Code	**UoS 201**	☐ **Lecture**
		☐ **Lab**
ECTS Credits	2	☐ **Tutorial**
SWL (hr/sem)	50	☐ **Practical**
		☐ **Seminar**

Module Level	UGI- 2	Semester (s) offered	3
Administering Department	BSc – COMM	**College**	College of Engineering
Module Leader		**e-mail**	
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	Ph.D
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Review Committee Approval	10/9/2023	**Version Number**	1.0

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

Module Objectives أهداف المادة الدراسية	. تدريس اللغة العربية يهدف إلى تحقيق الأهداف التالية: 1- تعليم اللغة العربية كلغة أساسية للتواصل والتفاعل بين أفراد المجتمع. 2- تطوير مهارات الاستماع والتحدث والقراءة والكتابة في اللغة العربية. 3- تنمية قدرات التفكير والتحليل والابتكار عن طريق دراسة الأدب والشعر والنثر. 4- توسيع المعرفة بثقافات المجتمعات الناطقة باللغة العربية، وزيادة فهم الموروثات التاريخية والثقافية لهذه المجتمعات. 5- تطوير مهارات التواصل بين أفراد المجتمعات المختلفة من خلال تحسين فهم لغات أخرى، مثل التحدث بالإنجليزية. 6- إبراز دور اللغة العربية في نشر قيم التسامح والانفتاح على ثقافات جديدة، مما يؤدي إلى تعزيز العلاقات الاجتماعية والتعاون بين الأفراد. 7 - الهدف من هذا الفصل الدراس هو تعريف الطلاب بالموضوعات الرئيسية لمادة اللغة العربية. سيغط الفصل الدراس المتطلبات الأساسية لتعاريف اللغة العربية، قواعد نحوية للأزمنة، تنمية القدرات النحوية لصيغ المفرد والجمع والممنوع من الجرد، بالإضافة الى البلاغة والتطبيق. وف نهاية الفصل، سيكون لدى الطلاب معرفة واسعة بالمفاهيم وسيتم تحقيق ذلك من خلال المحاضرات النظرية والدروس والواجبات البتية والتقارير ذات الصلة بالمواضيع المطروقة
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	١. تعريف الطالب بألفاظ اللغة العربية الصحيحة وتراكيبها وأساليبها السليمة بطريقة مشوقة وجذابة. ٢. أن يستغل الطالب وقت فراغه بالقراءة والاطلاع والرجوع إلى المكتبة. ٣. تمكين الطالب من القراءة الصحيحة، وأن يكتسب القدرة عل استعمال اللغة استعماًلا صحيحً ا ف الاّتصال مع الآخرين. ٤. تنمية الذوق الأدرن لدى الطالب ح رت يدرك النواح الجمالية ف أساليب الكلام ومعانيه وصورة. ٥. تنمية قدرة ومهارة الطالب الإملائية والخطية بحيث يستطيع الكتابة الصحيحة للكتب والمخاطبات الرسمية. ٦. تمكين الطالب عل كتابة التقارير العملية والنظرية والعروض التقديمية بلغة عربية واضحة وصحيحة. ٧. القدرة عل اكتساب وتطبيق المعرفة الجديدة واستخدام اس رباتيجيات تعليم مناسبة. ٨. القدرة عل المشاركة والعمل بمهنية واخلاقية للعمل ف فرق متعددة التخصصات.
Indicative Contents المحتويات الإرشادية	الجزء الأول: مقدمة عن اللغة العربية (٤ساعات) ، مقدمة عن اللغة العربية ، تعريف اللغة العربية ومميزتها. الجزء الثاني : قواعد نحوية وتشمل: (٦ساعات) ، الفعل الماضي ، الفعل المضارع ، الافعال الخمسة. الجزء الثالث: تنمية القواعد النحوية وتشمل: (٦ساعات) ، المثنى والجمع (المذكر السالم والمؤنث السالم)، التعجب، الممنوع من الصرف ، المجرد والمزي.

	: الجزء الرابع: البلاغة والتطبيق (٨ساعات) ، الاستعارة ، الجناس ، الطباق ، التشبيه. الجزء الخامس: قواعد املائية: (٣ساعات) ، سوف يتم تعريف الطالب عن الأخطاء الاملائية الشائعة وطرق تجنبها بالإضافة الى كتابة المخاطبات الادارية. الجزء السادس: قواعد العد والمعدود: (٣ساعات) ، تعريف الطالب بقواعد واحكام العد والمعدود ف اللغة العربية.
Learning and Teaching Strategies استراتيجيات التعلم والتعلم	
Strategies	توسيع مدارك الطلاب لمادة اللغة العربية، والإلمام بالمفاهيم الأساسية للغية العربية والبلاغة، والقدرة على التميب بي الأزمنة. يحتوي هذه الفصل على العديد من المكونات التي تشمل دراسةالمحاضرات والبرامج التعليمية والمناقشة والواجبات المنزلية ومنصات التعلم الالكتروني . سيتم تدريس الدورة باللغة العربية، ويجب تقديم جميع المهام الإلزامية في غضون المواعيد النهائية للقبول في الامتحان . استخدام المواد التعليمية المناسبة: يجب على المعلم اختيار المواد التعليمية التي تناسب مستوى الطلاب وتحقق أهداف التعلم. تشجيع الطلاب على المشاركة: يجب على المعلم تشجيع الطلاب على المشاركة في الحصص والتحدث باللغة العربية. استخدام التكنولوجيا: يمكن استخدام التكنولوجيا في تدريس اللغة العربية، مثل استخدام برامج التعلم عبر الإنترنت والأفلام والأغاني. إظهار أهمية الثقافة: يجب على المعلم إظهار أهمية الثقافة العربية وتعريف الطلاب بالتقاليد والعادات العربية. استخدام المناهج المناسبة: يجب على المدارس اختيار المناهج التي تناسب مستوى الطلاب وتحقق أهداف التعلم في تدريس اللغة العربية
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	17	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**50**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	4,8,14	LO #1, 4 and 7
	Assignments	3	10% (10)	2 to 13	LO #1, 2, 3, 4, 5 and 7
	Projects.	3	10% (10)	Continuous	All
	Report	1	10% (10)	5 to 14	LO #1 to #7
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

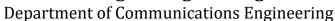|	Material Covered
Week 1	تعريف الطلاب بأهمية اللغة العربية وتعريف الطلاب بالفروق بين علم النحو والصرف والصوت.
Week 2	تعريف الطلاب بالجملة الفعلية والجملة الاسمية.بيان عناصر كل جملة بدأ بالفعل من حيث اللزوم والتعدي.
Week 3	الفعل من حيث الزمن ماضي ومضارع وأمر، حالات بناء الفعل الماضي.
Week 4	حالات الفعل المضارع من حيث :رفع ونصب الفعل المضارع وعلاماته.
Week 5	حالات الفعل المضارع من حيث : جزم الفعل المضارع وعلاماته
Week 6	حالات الفعل المضارع من حيث : بناء الفعل المضارع وعلاماته
Week 7	حالات بناء فعل الأمر، الفاعل وأنواعه وعلاماته ، المفعول به وانواعه وعلاماته،
Week 8	Mid-term Exam.
Week 9	المبتدأ وانواعه، الخبر وانواعه وتقديم الخبر على المبتدأ، الأسماء الخمسة ، العدد
Week 10	قواعد نحوية: الفعل الماضي ، قواعد نحوية: الفعل المضارع، قواعد نحوية: الأفعال الخمسة،
Week 11	تنمية القواعد النحوية: المثت والجمع (المذكر السالم والمؤنث السالم) ، تنمية القواعد النحوية: التعجب، الممنوع من

	الصرف والمجرد والمزيد،
Week 12	البلاغة والتطبيق: الاستعارة ، البلاغة والتطبيق: الجناس ، البلاغة والتطبيق: الطباق، البلاغة والتطبيق: التشبيه
Week 13	**الأخطاء الاملائية ، المخاطبات الإدارية**
Week 14	قواعد واحكام العد والمعدود
Week 15	قواعد واحكام العد والمعدود
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	جامع الدروس العربية / مصطف الغلاييت .	Yes
Recommended Texts	النحو الوافي / عباس حسن	Yes
Websites	https://uomosul.edu.iq/en/engineering/environmental-engineering-dept/	

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.

ACADEMIC DESCRIPTION CURRICULUM FOR THE FIRST STAGE (4ᵗʰ Semester)

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية			
Module Title	**ELECTRONICS II**	**Module Delivery**	
Module Type	CORE	☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**DOC 204**		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	UGI- 2	**Semester (s) offered**	4
Administering Department	BSc – COMM	**College**	College of Engineering
Module Leader		**e-mail**	
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	Ph.D
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Review Committee Approval	10/9/2023	**Version Number**	1.0

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills of electronic circuit through the understanding solid state for each electronic passive and active elements such as amplifiers, oscillators, and integrated circuits. 2. To understand Basic power amplifiers through graphical analysis and Frequency Response. 3. This course deals with the basic concept of Power Amplifier and its Classes. 4. To understand the Feedback Amplifier circuits. 5. To understand the RF amplifiers circuits. 6. To Describe the oscillators circuits types. 7. To Describe and operation of several integrated circuit such as timer IC555, VCO IC566, and PLL IC655. 8. To understand the basic construction and characteristics of FETs, Depletion Type MOSFET, and Enhancement-Type MOSFET, VMOS, CMOS. 9. To understand the operation of FET- Biasing for JFETs, Depletion-Type MOSFET, and Enhancement-Type MOSFET configurations. 10. To design D.C. biasing FETs networks. 11. To describe the scientific basis for FET, D-MOSFET, E-MOSFET transistor models. Analyze the negative feedback types with their circuits such as voltage-series, voltage-shunt, current series and current-shunt. 12. Calculate all negative feedback parameters such as open and feedback gains, input and output impendences. 13. Describe the basic operational amplifier, modes, and its characteristics. 14. Analyze the overall op-amps circuits and applications. 15. Understand the integrated circuit of the logic family.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course is intended for teaching the basic principle of Electronics II for engineering students at the beginning graduate level. The course will have these important outcomes: 1. Recognize the classes of the Power Amplifiers and Frequency Response of Multistage Amplifiers. 2. List the various terms associated with all active electronics devices. 3. Summarize what is meant by an active electronic device such as operational amplifiers, IC555, VCO, and PLL integrated circuit. 4. Describe the types of Oscillator (Radio Frequency) and filters.

	5. Discuss the various properties of Differential Amplifier and its applications.
	6. Explain the Power Supply Circuits and voltage regulators.
	7. Explain the operation of timer integrated circuits.
	8. Describe and analyses the gain-versus-frequency responses of basic types of filters such as LPF, HPF, BPF and BSF (BRF).
	9. Identify the operating principles of an oscillator.
	10. Analyze the operation of all types of oscillators like RC feedback, LC feedback, relaxation oscillators and special oscillator circuits.
	11. Identify the timing circuits based on the Astable, Monostable and Bistable timing modes of operations.
	12. Design the suitable circuit of power amplifiers such as class A, class B, class AB and class C power amplifiers.
	13. Gain knowledge of the operation of some Integrated Circuit Technologies including the TTL, NMOS, PMOS, and CMOS technologies .
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: **Part A –** Frequency Response and Active Filters. Explore the frequency response characteristics of electronic active filters. Focusing on the gain-versus-frequency responses of basic filter types such as low-pass filters (LPF), high-pass filters (HPF), band-pass filters (BPF), and band-stop filters (BSF or BRF). Butterworth, Chebyshev, and Bessel filter responses. The relevant parameters such as gain, cut-off frequency, bandwidth, quality and damping factors. [20 hrs] **Part B**- Oscillators and Timing Circuits. Operating principles and conditions of positive feedback oscillators. Oscillator's types including RC-oscillators (Phase Shift, Wien Bridge, and Twin-T Oscillators), LC oscillators (Colpitts, Hartley and Clapp oscillators) and relaxation oscillators (Astable multivibrator, square and triangle wave generators). Examine timing circuits based on various modes of operation, including Astable, Monostable, and Bistable modes. [20] **Part C**- Power Amplifiers and Integrated Circuit Technologies Power amplifier characteristics, operating points, DC & AC-load lines, dc-input power, ac-output power, and efficiency. Class A power amplifier simple and Darlington expanded types. Class B power amplifier with push-Pull, and complementary symmetry. Class AB power amplifier with handling cross over distortion, and Class C power amplifier. Delve and Gain insights into different integrated circuit technologies, such as TTL, NMOS, PMOS, and CMOS. [20 hrs] **Part D**- Power Amplifier Class (A), Power Amplifier Class (B, AB), Power Amplifier Class (C). Power Amplifier Class (D). [15 hrs.] Revision problem and tutorial classes [5 hrs.] Quizzes [1 hr.]. Amplifiers Circuit and timer integrated circuit Negative and Positive Amplifier

	Circuit. Oscillator (Radio Frequency) and its types. Timer integrated circuit design IC555. [15 hrs.] Revision problem and tutorial classes [5 hrs.]Quizzes [1 hr.] The voltage controlled oscillators VCO IC566. The phase locked loop PLL IC655. Frequency Synthesizer. Power Supply Circuit. Types of Voltage Regulator Power Supply Circuit. [15 hrs.] Revision problem and tutorial classes [5 hrs.] Quizzes [1 hr.].		

Learning and Teaching Strategies
استراتيجيات التعلم والتعلم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. The main strategy that will be adopted in delivering this module is: Interactive Discussions: Engage students in interactive discussions to encourage active learning. Encourage students to ask questions, participate in class discussions, and share their perspectives and experiences related to the topics being taught. Problem-Solving Sessions: Allocate dedicated time for hands-on practical and problem-solving sessions where students can apply the concepts learned to solve exercises. Assessment and Feedback:

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
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**200**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	4,8,14	LO #1, 4, 6 and 13
	Assignments	3	10% (10)	2 to 13	LO #1, 2, 3, 4, 5 and 13
	Projects.	3	10% (10)	Continuous	All
	Report/ Lab	5 - 1	10% (10)	5 to 14	LO #1 to #8
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #8
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Basics of the power amplifiers and its classes with applications. Power Amplifier Class (A). Power Amplifier Class (B).
Week 2	Power Amplifier Class (AB). Power Amplifier Class (C, D). Negative Amplifier Circuit. Positive Amplifier Circuit.
Week 3	Active filter response characteristics, types. Active low and high-pass filters. Active band pass and band stop (reject) filters. Special types of active filter circuits.
Week 4	Oscillator (Radio Frequency) circuit and its types 1. Oscillator (Radio Frequency) circuit and its types 2. Special types of active filter circuits.
Week 5	Feedback oscillator conditions and oscillators with RC feedback circuits
Week 6	Oscillators with LC feedback circuits. Timer integrated circuits IC555. The voltage controlled oscillators VCO IC566. The phase locked loop PLL IC655.
Week 7	Multivibrator circuits (Astable types). Multivibrator circuits (Monostable and Bistable types).
Week 8	**Mid-term Exam.**
Week 9	Frequency Synthesizer. Power Supply Circuit. Types of Voltage Regulator

Week 10	Inverting and non inverting closed loop amplifier. Integration and differentiation active circuits. Summation and subtraction op-amp circuits.
Week 11	Feedback effect on amplifier gain, bandwidth, and on input-output resistances operational amplifier construction and operation , ideal and practical op-amp equivalent circuit
Week 12	Thyristor equivalent circuit and characteristics. FET and MOS transistors operation
Week 13	Integrated Circuit Technologies (TTL).
Week 14	Integrated Circuit Technologies (NMOS and PMOS)
Week 15	Integrated Circuit Technologies (CMOS).
Week 16	**Preparatory week before the final Exam**

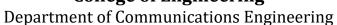| Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Power Amplifier Class (A). Power Amplifier Class (B).
Week 2	Lab 2: Negative Amplifier Circuit. Positive Amplifier Circuit.
Week 3	Lab 3: Active low and high-pass filters.
Week 4	Lab 4: Active band pass and band stop (reject) filters. Special types of active filter circuits.
Week 5	Lab 5: Oscillator (Radio Frequency) circuit and its types 2,
Week 6	Lab 6: Feedback oscillator conditions and oscillators with RC feedback circuits.
Week 7	Lab 7: Timer integrated circuits IC555. The voltage controlled oscillators VCO IC566.
Week 8	Lab 8: Multivibrator circuits (Astable types). Multivibrator circuits (Monostable and Bistable types).
Week 9	Lab 9: Frequency Synthesizer. Power Supply Circuit. Types of Voltage Regulator
Week 10	Lab 10: Inverting and non inverting closed loop amplifier.
Week 11	Lab 11: Integration and differentiation active circuits..
Week 12	Lab 12: Thyristor equivalent circuit and characteristics.
Week 13	Lab 13: FET and MOS transistors operation
Week 14	Lab 14: Integrated Circuit Technologies (TTL). Integrated Circuit Technologies (CMOS).
Week 15	**Final Exam**

	Learning and Teaching Resources مصادر التعلم والتدريس	
	Text	**Available in the Library?**
Required Texts	Floyd, Thomas L. Electronics Fundamentals: Circuits, Devices and Applications (Floyd Electronics Fundamentals Series). Prentice-Hall, Inc., 2006. ROBERT BOYLESTAD and LOUIS NASHELSKY. "Electronic Devices and Circuit Theory". 7th ed. Prentice Hal	Yes
Recommended Texts	Donald A. Neamen. (2003). "SEMICONDUCTOR PHYSICS AND DEVICES". 3rd Edition, ISBN 0-07-232107-05, USA. (can be downloaded from the Course web page/classroom).	Yes
Websites		

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

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

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

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

Module Information معلومات المادة الدراسية		
Module Title	**ELECTROMAGNETIC FIELDS II**	**Module Delivery**
Module Type	CORE	☒ **Theory** ☐ **Lecture** ☐ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**
Module Code	**DOC 202**	
ECTS Credits	6	
SWL (hr/sem)	150	

Module Level	UGI- 2	**Semester (s) offered**		4
Administering Department	BSc – COMM	**College**	College of Engineering	
Module Leader		**e-mail**		
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	Ph.D	
Module Tutor		**e-mail**		
Peer Reviewer Name		**e-mail**		
Review Committee Approval	10/9/2023	**Version Number**	1.0	

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

Module Objectives أهداف المادة الدراسية	1. Electromagnetic principles are fundamental to the study of electrical engineering and physics. 2. To understand Electromagnetic theory is also indispensable to the understanding, analysis and design of various electrical, electromechanical and electronic systems. 3. The primary aim of this module is to deepen the understanding of electromagnetic field theory and its applications in advanced engineering problems 4. Understand and apply Maxwell's Equations: Comprehend the fundamental laws governing electromagnetism and solve problems using Maxwell's equations. 5. The course focuses on the mathematical foundations and physical principles underlying electromagnetic phenomena and equips students with the skills to analyze complex systems. 7. To understand the magnetic field due to different current distributions. 8. To understand different laws such as Coulomb's Law, Gauss's Law, Biot Savart's Law, Ampere's Law, and Faraday's Law. 9. Design basic antennas and analyze their radiation patterns and efficiency.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course is intended for teaching the basic principle of Electromagnetic Fields I for engineering students at the beginning graduate level. The course will have these important outcomes: (1) Understand and apply Maxwell's Equations: Comprehend the fundamental laws governing electromagnetism and solve problems using Maxwell's equations. (2) Analyze Electromagnetic Waves: Analyze the propagation of electromagnetic waves in various media, including free space, conductors, and dielectric materials. (3) Solve Boundary Value Problems: Apply boundary conditions to solve problems involving electromagnetic fields in different configurations and geometries. (4) Understand Waveguides and Resonators: Analyze the behavior of electromagnetic waves in waveguides and resonators and understand their applications in communication systems. (5) Utilize Numerical Methods: Employ numerical methods such as Finite Element Method (FEM) and Finite Difference Time Domain (FDTD) for solving complex electromagnetic field problems.

	(6) Design Antennas and Study Radiation Patterns: Design basic antennas and analyze their radiation patterns and efficiency. (7) Investigate Advanced Topics: Explore advanced topics such as metamaterials, plasmonics, and photonic crystals.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part D-** conductors, dielectrics, and capacitance conductors, dielectrics and capacitance: electric fields in material space. Conductors, dielectrics, and capacitance: dielectric – dielectric boundary conditions, conductor – dielectric boundary conditions, conductor – free space boundary conditions. Conductors, dielectrics, and capacitance: capacitance and capacitors. Maxwell's equations: the vector operator (del) and the divergence theorem. Maxwell's equations: derivation of Maxwell's equations and applications. Maxwell's equations: the uniform plane wave. Maxwell's equations: wave propagation in free space. [12 hrs.]. Revision problem and tutorial classes [4 hrs.] Quizzes [1 hr.] **Part B**- Electromagnetic Wave Propagation. Plane wave solutions. Polarization of waves. Wave propagation in free space and various media (dielectrics, conductors, plasmas) . Reflection and refraction at boundaries. Boundary Value Problems Methods for solving boundary value problems in electromagnetics Examples involving parallel plates, coaxial cables, and spherical coordinate. Waveguides and Resonators Theory of waveguides: rectangular, circular, and planar waveguides Mode theory and cutoff frequencies. **Part C:** Antenna Theory and Design. Fundamentals of antenna theory. Types of antennas: dipole, monopole, array antennas, patch antennas. Radiation patterns and gain. Practical design considerations. Metamaterials and their electromagnetic properties. Plasmonics and applications in nano-optics. Photonic crystals and bandgap materials. Recent research trends in electromagnetics
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. he primary aim of this module is to deepen the understanding of electromagnetic field theory and its applications in advanced engineering problems. The course focuses on the mathematical foundations and physical principles underlying electromagnetic phenomena and equips students with the skills to analyze complex systems.

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	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	4,8,14	LO #1, 4 and 7
	Assignments	3	10% (10)	2 to 13	LO #1, 2, 3, 4, 5 and 7
	Projects.	3	10% (10)	Continuous	All
	Report	1	10% (10)	5 to 14	LO #1 to #7
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	Magnetic forces, work & power: force on a moving charge. Work and power.
Week 2	Magnetic forces, work & power: power. Time varying fields: faraday's law. Time varying fields: induced electromotive force.
Week 3	Maxwell's equations: the uniform plane wave.
Week 4	Maxwell's equations: wave propagation in free space.
Week 5	Poisson and Laplace equations
Week 6	Inductance and Inductor. Energy stored in Magnetic Field
Week 7	Boundary Conditions for Electromagnetic fields. Time Harmonic Fields.
Week 8	**Mid-term Exam**.
Week 9	Plane waves in Lossless medium. Plane waves in a lossy medium
Week 10	Poynting Vector and Power Flow in Electromagnetic Fields.
Week 11	Polarization of plane wave. Behaviour of Plane waves at the interface of two media
Week 12	Fundamentals of Radiation. Radiated field of an Herzian dipole.
Week 13	Basic Antenna Parameters. Half Wave Dipole Antenna. Introduction to Antenna Arrays.
Week 14	Introduction to numerical techniques in electromagnetics. Basic Concepts of the Method of Moments.
Week 15	Method of Moment for Wire Antennas and Wire Scatterers. Electromagnetic principles find applications
Week 16	**Preparatory week before the final Exam**

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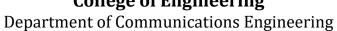<tr><th colspan="3">Learning and Teaching Resources
مصادر التعلم والتدريس</th></tr>
<tr><td></td><td>Text</td><td>Available in the Library?</td></tr>
<tr><td>Required Texts</td><td>"Electromagnetic Waves and Radiating Systems" by Edward C. Jordan and Keith G. Balmain.
"Field and Wave Electromagnetics" by David K. Cheng</td><td>Yes</td></tr>
<tr><td>Recommended Texts</td><td>"Classical Electrodynamics" by John D. Jackson
-ENGINEERING ELECTROMAGNETICES, Mc- Graw Hill,
By WILLAIM H. HAYT.
Electromagnetics (Schaum's Outlines), McGraw-Hill Education, By Edminister, Joseph_ Nahvi, Mahmood</td><td>Yes</td></tr>
<tr><td>Websites</td><td colspan="2">ANSYS HFSS, COMSOL Multiphysics, CST Microwave Studio</td></tr>
</table>

Group	Grade	التقدير	Marks %	Definition
Grading Scheme مخطط الدرجات				
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.

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

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			

Module Title	ELECTRICAL CIRCUITS	**Module Delivery**	
Module Type	CORE	☒ **Theory**	
Module Code	**DOC 207**	☐ **Lecture** ☐ **Lab**	
ECTS Credits	6	☒ **Tutorial**	
SWL (hr/sem)	150	☐ **Practical** ☐ **Seminar**	

Module Level	UGI- 2	**Semester (s) offered**	4
Administering Department	BSc – COMM	**College**	College of Engineering
Module Leader		**e-mail**	
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	Ph.D
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Review Committee Approval	10/9/2023	**Version Number**	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. Ability to understand the AC Circuit Power Analysis and Poly-phase Circuits 2. Ability to determine the Transient Response of RL /RC Circuit and the Transient Response of RLC Circuit 3. Ability to analysis Magnetically Coupled Circuits and Ideal Transformers 4. Ability to solve the mathematical equations for Complex Frequency, Laplace Transform, Frequency Response and Fourier Circuit Analysis 5. Ability to synthesize the Circuit Analysis in the s-Domain and Two-Port Networks.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course is intended for teaching the basic principle of Electromagnetic Fields I for engineering students at the beginning graduate level. The course will have these important outcomes: (1) Use basic electrical DC concepts and theorems to analyze circuits (2) Build and simulate electrical DC circuits and perform measurements with electronic test equipment (3) Understand the fundamental concepts of electrical circuits, including voltage, current, resistance, and power. (4) Analyze and solve basic DC (direct current) circuits using Ohm's Law, Kirchhoff's Laws, and nodal/mesh analysis techniques. (5) Apply techniques to analyze and solve AC (alternating current) circuits, including complex impedance, phasor representation, and frequency response. (6) Demonstrate proficiency in analyzing circuits with passive elements such as resistors, capacitors, and inductors. (7) Use circuit simulation software and laboratory equipment to verify theoretical analysis and gain practical experience in circuit analysis. (8) Analyze and solve circuits with operational amplifiers (op-amps), including understanding their basic configurations and applications. (9) Understand the concepts of power in electrical circuits, including active power, reactive power, and power factor correction. (10) Develop critical thinking and problem-solving skills by applying circuit analysis techniques to real-world electrical engineering problems.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. **Part A-** Transient Circuits. The Transient Circuits: RC, RL, RLC circuit in series and parallel and their complete response in time and Frequency. Poly-phase Circuits: Single-phase and three phase wire system, 3-Phase balance and unbalance system star and delta connections. Power in 3-phase circuits. Magnetic coupling circuit: Coefficient of coupling, Linear and ideal transformers. 15 hrs.] Revision problem and tutorial classes [8 hrs.]

	Quizzes [1 hr.] **Part B-** Two-Port Networks: One-pot networks, y-z-h-g and ABCD parameters, Complex Frequency and Circuit Analysis in the s-Domain**,** Frequency Response**,** Filters: Constant k-filters, Low pass and high pass modern filter design, Butterworth and filters, Network transformations, and all pass filter, Active filter. 15 hrs.] Revision problem and tutorial classes [8 hrs.] Quizzes [1 hr.]

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

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

Student Workload (SWL)

الحمل الدراسي للطالب 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	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	Electrical Engineering Fundamentals I and Electrical Engineering Fundamentals II.	**Semester**	1 & 2
Co-requisites module	None	**Semester**	

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4,8,14	LO #1, 4 and 10
	Assignments	3	10% (10)	2 to 13	LO #1, 2, 3, 4, 5 and 10
	Projects.	3	10% (10)	Continuous	All
	Report	1	10% (10)	5 to 14	LO #1 to #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	Advantages and Disadvantages of Electrical Networks as different circuits.
Week 2	Transient Response of RL Circuit and Transient Response of RC Circuit. Unit step functions
Week 3	Complete response of RL and RC Circuits. Transient Response of RLC Circuit / Parallel connection.
Week 4	Transient Response of RLC Circuit / Series connection. Complete response of RLC Circuit / Parallel and Series connections.
Week 5	Poly-phase Circuits. Three phase circuit analysis / Balance load. Three phase circuit analysis / Un-Balance load
Week 6	Three phase wattmeter's. Magnetically Coupled Circuits.
Week 7	Linear and Ideal Transformers.
Week 8	**Mid-term Exam**.
Week 9	Two-Port Networks: One-pot networks. Two-Port Networks : y-z-h-g parameters

Week 10	Two-Port Networks: ABCD parameters.
Week 11	Complex Frequency. Circuit Analysis in the S-Domain.
Week 12	Frequency Response. Bode Diagrams
Week 13	Filters: Constant k-filters, Low pass and high pass. Filters: modern filter design, Butterworth and filters.
Week 14	Filters: Network transformations. All pass filter. Active filter
Week 15	Fourier circuit analysis.
Week 16	**Preparatory week before the final Exam**

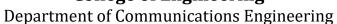| **Learning and Teaching Resources** مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Engineering Circuit Analysis Eight Edition (William H. Hayt) 2012. Fundamentals of Electric Circuits (Charles K. Alexander)2009	Yes
Recommended Texts	Electric Circuits Tenth Edition (James W. Nilsson) 2015	Yes
Websites	https://www.pdfdrive.com/schaums-outline-of-electric-circuits-e185851170.html	

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
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	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
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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.

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

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		

Module Title	FUNDAMENTALS OF COMMUNICATION	Module Delivery
Module Type	CORE	☒ Theory
Module Code	DOC 208	☒ Lecture
		☐ Lab
ECTS Credits	6	☐ Tutorial
		☐ Practical
SWL (hr/sem)	150	☐ Seminar

Module Level	UGI- 2	Semester (s) offered		4
Administering Department	BSc – COMM	College	College of Engineering	
Module Leader		e-mail		
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification	Ph.D	
Module Tutor		e-mail		
Peer Reviewer Name		e-mail		
Review Committee Approval	10/9/2023	Version Number	1.0	

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

Module Objectives أهداف المادة الدراسية	1. The aim of this module is to provide students with a comprehensive understanding of the fundamental principles of communication systems, with a focus on both theoretical and practical aspects. 2. This includes the study of transmission lines, signal propagation, modulation techniques, and an introduction to various communication systems. 3. The module aims to equip students with the knowledge and skills necessary to analyze, design, and evaluate basic communication systems. 4. To develop problem solving skills and understanding of the propagation methods of electrical signals across transmission lines. 5. To understand the reflection in transmission line. 6. This course deals with the mathematical calculations for the propagation of signals through transmission lines. 7. This is the basic subject for all A.C. Steady state transmission line. To understand crank method for the analysis of transmission lines. 8. To perform graphical solution of lossless transmission line using Smith chart. To perform transmission line matching using Quarter Wave Transformer (λ/4)
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course is intended for teaching Fundamentals of Communication for engineering students at the beginning graduate level. The course will have these important outcomes: (1) Understand Basic Concepts: Comprehend the fundamental concepts and terminologies used in communication engineering. (2) Analyze Transmission Lines: Analyze the behavior and characteristics of transmission lines and understand their role in communication systems. (3) Understand Modulation Techniques: Understand and apply various analog and digital modulation techniques. (4) Evaluate Communication Systems: Evaluate the performance of communication systems using appropriate metrics. (5) Design Simple Communication Systems: Design basic communication systems and assess their performance. (6) Understand Signal Propagation: Understand the principles of signal propagation and the impact of the transmission medium. (7) Use Practical Tools: Utilize modern tools and software for the simulation and analysis of communication systems.

	(8) Know the propagation methods of electrical signals across transmission lines. Conduct mathematical calculations for the propagation of signals through transmission lines. (9) Handling crank method in the analysis of transmission lines. Use the Smith chart and its applications. Identify types of electrical signals.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **Part A-** Introduction to Communication Systems: Overview of communication systems, Historical development and significance, and Basic terminologies and concepts. Transmission Lines. Types of transmission lines (coaxial cables, twisted pairs, waveguides, etc.). Transmission line parameters (resistance, inductance, capacitance, conductance). Impedance matching and Smith Chart Reflection and transmission coefficients. Signal attenuation and dispersion. Signal Propagation Electromagnetic wave propagation. Free-space propagation. Reflection, refraction, diffraction, and scattering. Multipath propagation and fading. Link budget analysis. [15 hrs.]. Revision problem and tutorial classes [8 hrs.] Quizzes [1 hr.] **Part B-** Signal classifications. Fourier series. Fourier Transform. Signals and linear systems. Power spectral density and Correlation. Definition and classification of signals. Basic operations on signals. Time-Domain Analysis of Continuous-Time Systems. Convolution and impulse response. Frequency-Domain Analysis of Continuous-Time Systems. Discrete-Time Signals and Systems. Frequency-Domain Analysis of Discrete-Time Systems. Modulation and Demodulation Techniques. [15 hrs.]. Revision problem and tutorial classes [8 hrs.] Quizzes [1 hr.] **Part C:** Analog Modulation Techniques. Amplitude Modulation (AM) Frequency Modulation (FM) and Phase Modulation (PM). Digital Modulation Techniques. Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and Quadrature Amplitude Modulation (QAM). Noise in Communication Systems. Signal-to-Noise Ratio (SNR) and its impact on system performance. Shannon's theorem and its implications. Mutual information and channel capacity. Sampling and Quantization. Quantization and encoding. Channel Coding and Error Control. Linear block codes and convolutional codes. Spread Spectrum and Multiple Access Techniques. Direct sequence and frequency hopping spread spectrum. Code Division Multiple Access (CDMA). Time Division Multiple Access (TDMA) and Frequency Division Multiple Access (FDMA). Types of communication networks. Telephone communication networks. Public Switched Telephone Network (PSTN). Integrated Services Digital Network (ISDN). Voice over Internet Protocol (VoIP). Mobile Networks (Cellular Networks). Satellite Phones. Cellular Digital Packet Data (CDPD). Global System for Mobile Communications (GSM). Code Division Multiple Access (CDMA) [15 hrs.] Revision problem and tutorial classes [8 hrs.] Quizzes [1 hr.] .

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

Learning and Teaching Strategies	
استراتيجيات التعلم والتعليم	
Strategies	The aim of this module is to provide students with a comprehensive understanding of the fundamental principles of communication systems, with a focus on both theoretical and practical aspects. This includes the study of transmission lines, signal propagation, modulation techniques, and an introduction to various communication systems. The module aims to equip students with the knowledge and skills necessary to analyze, design, and evaluate basic communication systems. Transmission lines are fundamental components in communication engineering, serving as the medium through which signals are transmitted from one point to another. They play a critical role in the effective and efficient delivery of electrical signals, ensuring minimal loss and distortion over various distances. The primary aim of this module is to provide students with a comprehensive understanding of the principles and applications of signals and systems in communication engineering. This includes the analysis, design, and implementation of systems for processing and transmitting signals in both analog and digital forms.

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	57	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3.8
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	10% (10)	4,8,14	LO #1, 4 and 9
	Assignments	3	10% (10)	2 to 13	LO #1, 2, 3, 4, 5 and 9
	Projects.	3	10% (10)	Continuous	All
	Report	1	10% (10)	5 to 14	LO #1 to #6
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO #1 - #6
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to Communication Systems. Overview of communication systems. Basic terminologies and concepts.
Week 2	Transmission Lines. Types of transmission lines (coaxial cables, twisted pairs, waveguides,..)
Week 3	Transmission line parameters (resistance, inductance, capacitance, conductance). Impedance matching and Smith Chart. Reflection and transmission coefficients. Signal attenuation and dispersion.
Week 4	Signal Propagation. Electromagnetic wave propagation, Free-space propagation, Reflection, refraction, diffraction, and scattering. Multipath propagation and fading
Week 5	Fourier series and Fourier transform, Laplace transform and its applications Frequency response and Bode plots. Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT)
Week 6	Analog Modulation Techniques, Amplitude Modulation (AM), Frequency Modulation (FM) and Phase Modulation (PM).
Week 7	Noise in Communication Systems. Types of noise: thermal noise, shot noise, and other sources of noise

Week 8	**Mid-term Exam**.
Week 9	Digital Modulation Techniques, Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK) Phase Shift Keying (PSK), and Quadrature Amplitude Modulation (QAM).
Week 10	Mutual information and channel capacity, Shannon's theorem and its implications, Sampling and Quantization. Channel Coding and Error Control,
Week 11	Direct sequence and frequency hopping spread spectrum. Code Division Multiple Access (CDMA). Time Division Multiple Access (TDMA) and Frequency Division Multiple Access (FDMA)
Week 12	Filter Design and Analysis
Week 13	Types of communication networks.
Week 14	Types of telephone communication networks
Week 15	Mobile Networks (Cellular Networks) and Satellite Phones.
Week 16	**Preparatory week before the final Exam**

Learning and Teaching Resources
مصادر التعلم والتدريس

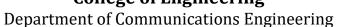|	Text	Available in the Library?
Required Texts	"Communication Systems" by Simon Haykin "Digital and Analog Communication Systems" by Leon W. Couch	Yes
Recommended Texts	"Principles of Communication Systems" by Herbert Taub and Donald L. Schilling "Electromagnetic Waves and Transmission Lines" by Frank Olynyk	Yes
Websites	IEEE Xplore Digital Library (for scholarly articles on advanced topics in transmission lines).	

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.

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

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		

Module Title	**ENGLISH LANGUAGE II**	**Module Delivery**	
Module Type	**BASIC**	☒ Theory	
Module Code	**UoS 202**	☐ Lecture	
		☐ Lab	
ECTS Credits	2	☐ Tutorial	
		☐ Practical	
SWL (hr/sem)	50	☐ Seminar	

Module Level	UGI- 2	**Semester (s) offered**	4
Administering Department	BSc – COMM	**College**	College of Engineering
Module Leader		**e-mail**	
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	Ph.D
Module Tutor		**e-mail**	
Peer Reviewer Name		**e-mail**	
Review Committee Approval	10/9/2023	**Version Number**	1.0

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	The Students will be able to: 1. Distinguish between dependent, Independent, and Integrated essays. 2. Find the topic and the thesis statement of short essays. 3. Identify the main ideas from the introduction paragraph. 4. Identify the main ideas from the body paragraph. 5. Find the supporting details from the introduction paragraph. 6. Find the supporting details from the body paragraph. 7. Draw an outline to link the ideas, supporting details, and essay topic. 8. Make notes in response to an essay question to create main ideas, supporting details, and thesis statement. 9. Write the introduction paragraph on basis of the thesis statement and main ideas. 10. Build the body paragraphs based on main ideas and supporting details. 11. Write the introduction paragraph based on the main ideas. 12. Enhance the smoothness and fluency of an essay by employing transition words and sentence starters.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	This course is intended for teaching English Language II for engineering students at the beginning graduate level. The course will have these important outcomes: 1. The student has better reading, writing, listening, and speaking skills. 2. They have better grammar understanding. 3. The students Learn more everyday English. 4. They have more syllables at your disposal. 5. They have more confidence interacting with native English speakers. 6. Write the introduction paragraph on basis of the thesis statement and main ideas. 7. Build the body paragraphs based on main ideas and supporting details. 8. Write the introduction paragraph based on the main ideas. 9. Enhance the smoothness and fluency of an essay by employing transition words and sentence starters.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** **Classification of Essays: [2 hrs]**, Independent essays based on personal thoughts. Dependent essays based on data, figures, diagrams. Integrated essays. Structure of academic essays: [6 hrs]. Analyzing academic essays according to the standard structure of academic essays. Idea Maps: [3 hrs]. Filling the idea maps from the major information extracted while reading an essay. Responding to an essay question: [4 hrs]. Building an outline using

personal ideas in response to an essay question. Writing Paragraphs: [6 hrs]. Writing thesis statement. The Introduction Paragraph. The Body Paragraphs. Essay Conclusion: [3 hrs]. Writing the conclusion paragraph considering the main ideas stated in the introduction and body paragraphs. Transition words and connection phrases: [3 hrs]. Dependent essays: [3hrs]. Introduction to essays based on figures, tables, diagrams, and processes.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering type of simple experiments involving some sampling activities that are interesting to the students. The approach to be followed here is to motivate students to analyze previously written model essays to understand the standard structure of academic essays then implement the same procedures to build their own essays.

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

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	ENGLISH LANGUAGE I	Semester	1
Co-requisites module	None	Semester	

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4,8,14	LO #1, 4 and 9
	Assignments	3	10% (10)	2 to 13	LO #1, 2, 3, 4, 5 and 9
	Projects.	3	10% (10)	Continuous	All
	Report	1	10% (10)	5 to 14	LO #1 to #7
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
	Material Covered
Week 1	Overview of Academic Essays Independent, Dependent, and Integrated essays Structure of academic essays
Week 2	Structure of academic essays
Week 3	Topic sentence and thesis statement Identifying topic sentence and thesis statement of academic essays.
Week 4	Main Ideas: Identifying the main Ideas of academic essays
Week 5	Supporting Details: Identifying the supporting details
Week 6	Essay outlines: Building Essay outlines using idea maps
Week 7	Essay Questions: Responding to essay questions by making personal notes.
Week 8	**Mid-term Exam**.
Week 9	Topic Sentence: Writing a thesis statement or topic sentence using personal thoughts. Idea Map Creation: Building an idea map of an essay question

Week 10	Personal Thoughts: Using personal thoughts to express main ideas and supporting details in response to an essay question.
Week 11	Transition words and sentence starters Increasing the fluency, coherence, and smooth transition of thoughts using sentence starters and transition words.
Week 12	Writing the Introduction: Combining the thesis statement and main ideas together to build the introduction paragraph.
Week 13	Writing the Conclusion
Week 14	Introduction to dependent writing tasks.
Week 15	Map Creation: Building an idea map of an essay question
Week 16	**Preparatory week before the final Exam**

<table>
<tr><td colspan="3" align="center">Learning and Teaching Resources
مصادر التعلم والتدريس</td></tr>
<tr><td></td><td align="center">Text</td><td align="center">Available in the Library?</td></tr>
<tr><td>Required Texts</td><td>Sharpe, P. J. (2009). Barron's TOEFL iBT. Barron's Educational Series.
John and Liz Soars New Headway Plus Pre-Intermediate
Oxford University Press</td><td align="center">Yes</td></tr>
<tr><td>Recommended Texts</td><td>Lougheed, L. (2016). Barron's Ielts with Mp3 Cd. Barron's. Supplemental materials will be provided by provided by the instructor.</td><td align="center">Yes</td></tr>
<tr><td>Websites</td><td></td><td></td></tr>
</table>

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

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

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

Module Information		
معلومات المادة الدراسية		

Module Title	CRIMES OF BAATH'S REGIME IN IRAQ	Module Delivery	
Module Type	BASIC	☒ Theory	
Module Code	**UoS 203**	☐ Lecture ☐ Lab	
ECTS Credits	2	☐ Tutorial	
SWL (hr/sem)	50	☐ Practical ☐ Seminar	

Module Level	UGI- 2	Semester (s) offered	4
Administering Department	BSc – COMM	College	College of Engineering
Module Leader		e-mail	
Module Leader's Acad. Title	Assist. Prof.	Module Leader's Qualification	Ph.D
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Review Committee Approval	10/9/2023	Version Number	1.0

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	افهام الطالب باهمية: تقوم الدراسة عل رشح النظم والحقوق الدولية ، وتبيان الجرائم الدولية ، والمحلية المرتكبة بحق الشعوب المجاورة للعراق ، وبحق الشعب العراف نفسه، المادة تسلط الضوء عل حقبة مهمة في تاريخ العراق وما حصل فيها من انتهاكات للحقوق جميعها ، من قتل وتشريد وتهجير ومصادرة الأموال ، وجرائم. الإبادة ، والجرائم السياسية، وانتهاكات حرية الدين والرأي، عل يد حزب البعث إن الجرائم المرتكبة تبدأ من بدايات نشأة حزب البعث المجرم في الستينات ولغاية حقبة الالفينات ، ان هذه الفية المهمة وما حصل فيها والتبعات منها ، ما يزال العراق يعاني منها، من غرامات دولية ، والحالة النفسية التي يعاني منها كل من تعرض للاذى بافعال حزب البعث الظالم، وتكمن الاهمية في تبيان هذه المظالم ، للاجيال الت لم تكن موجودة ف تلك الفية، وك لا تتحرر تلك الحقبة من جديد ف العراق يجب ان. يفهم الجيل الغي معاصر اهمية التاريخ ، كي نتجنب اخطاء الماض لوقتنا الحالي. التوعية بأهمية النظام والحقوق الدولية: تهدف المادة إلى زيادة وعي الطلاب بأهمية الأنظمة والقوانين الدولية التي تحمي حقوق الإنسان وتحدد الجرائم الدولية. فهم الجرائم الدولية والمحلية: مساعدة الطلاب على فهم الجرائم المرتكبة ضد الشعوب المجاورة للعراق وضد الشعب العراقي نفسه. تسليط الضوء على تاريخ العراق الحديث: التركيز على حقبة مهمة في تاريخ العراق تتضمن انتهاكات حقوق الإنسان على يد حزب البعث. تعزيز الوعي بالتبعات النفسية والاجتماعية: فهم التبعات النفسية والاجتماعية التي يعاني منها الشعب العراقي بسبب هذه الانتهاكات. تعليم الجيل الجديد أهمية التاريخ: تعزيز فهم الجيل الجديد لأهمية التاريخ لتجنب أخطاء الماضي. .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	١. تحليل وتقييم النظام الدولي للحقوق: سيتمكن الطلاب من تحليل وتقييم الأنظمة والقوانين الدولية المتعلقة بحقوق الإنسان. ٢. تحديد أنواع الجرائم الدولية: التعرف على مختلف أنواع الجرائم الدولية والمحلية التي ارتكبت خلال حقبة حكم حزب البعث. ٣. تقدير أهمية التوثيق التاريخي: إدراك أهمية التوثيق التاريخي في فهم الحاضر وتجنب تكرار أخطاء الماضي. ٤. تحليل التأثيرات النفسية والاجتماعية: تحليل التبعات النفسية والاجتماعية لانتهاكات حقوق الإنسان على المجتمعات والأفراد. ٥. تعزيز المهارات النقدية: تطوير المهارات النقدية لتحليل الأحداث التاريخية وربطها بالواقع الحالي.
Indicative Contents المحتويات الإرشادية	النظم والحقوق الدولية: مقدمة عن حقوق الإنسان والقوانين الدولية. تطور حقوق الإنسان عبر التاريخ. الجرائم الدولية والمحلية: تعريف الجرائم الدولية والمحلية. أمثلة على الجرائم المرتكبة بحق الشعوب المجاورة والعراق. حقبة حكم حزب البعث: نشأة حزب البعث وتاريخه. الانتهاكات والجرائم التي ارتكبها الحزب منذ الستينات حتى الألفينات. التبعات النفسية والاجتماعية: التبعات النفسية للجرائم والانتهاكات. التبعات الاجتماعية والاقتصادية على العراق. توثيق الجرائم والانتهاكات: أهمية توثيق الجرائم والانتهاكات. طرق وأساليب التوثيق التاريخي. التاريخ وأهميته للأجيال الجديدة: لماذا يجب علينا تعليم التاريخ للأجيال الجديدة. دور التعليم في منع تكرار أخطاء الماضي. تعتبر هذه المادة الدراسية ذات أهمية كبيرة لأنها تسلط الضوء على حقبة مهمة في تاريخ العراق تتسم بانتهاكات حقوق الإنسان والجرائم الدولية. من خلال دراسة هذه المادة، سيكون الطلاب قادرين على فهم الأنظمة الدولية لحماية حقوق الإنسان، التعرف على الجرائم الدولية والمحلية، وتقدير أهمية التوثيق التاريخي.

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	تعتبر هذه المادة الدراسية ذات أهمية كبيرة لأنها تسلط الضوء على حقبة مهمة في تاريخ العراق تتسم بانتهاكات حقوق الإنسان والجرائم الدولية. من خلال دراسة هذه المادة، سيكون الطلاب قادرين على فهم الأنظمة الدولية لحماية حقوق الإنسان، التعرف على الجرائم الدولية والمحلية، وتقدير أهمية التوثيق التاريخي لتجنب تكرار أخطاء الماضي. يجهز التدريس محاضرات عن المادة عل شكل ورقي واالكتروني ويقدمها للطلبة يقوم التدريس بالقاءالمحاضرات بشكل تفصيل . يقوم التدريس بطلب تقارير دورية وواجبات بيتيه عن المواضيع الاساسية للمادة.

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

Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	مفهوم الجرائم وأقسامها
Week 2	انواع الجرائم الدولية ، جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام ٢٠٠٥.
Week 3	القرارات الصادرة من المحكمة الجنائية العليا، جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام ٢٠٠٥
Week 4	ابرز قضايا جرائم حزب البعث. جريمة قمع الانتفاضة الشعبانية
Week 5	الجرائم النفسية والاجتماعية وآثارها، الجرائم النفسية والاجتماعية واثارها وابرز انتهاكات النظام البعثي في العراق
Week 6	انتهاكات القوانين العراقية ، تدمير دور العبادة كالمساجد والحسينيات والكنائس
Week 7	الجرائم البيئية لنظام البعث . حقبة حكم حزب البعث ، الاخفاء القسري للمواطنين ،
Week 8	Mid-term Exam.
Week 9	التلوث الحرن والاشعاعي ، تدمير الموارد البشرية و المادية و الاحصار الاقتصادي ، بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث
Week 10	تدمي القرى والمدن . النظم والحقوق الدولية: مدينة حلبجة ، الجرائم البيئية لنظام البعث في العراق.
Week 11	تجفيف الاهوار.. تجريف بساتين النخيل والاشجار والمزروعات

Week 12	جرائم المقابر الجماعية. سلب حقوق الإنسان عبر التاريخ حقبة البعث. الانتهاكات والجرائم التي ارتكبها الحزب منذ الستينات حتى الألفينات.
Week 13	**احداث مقابر الابادة الجماعية. التبعات الاجتماعية والاقتصادية على العراق.**
Week 14	التصنيف الزمت لمقابر الابادة الجماعية. التبعات النفسية للجرائم والانتهاكات.
Week 15	أهمية توثيق الجرائم والانتهاكات. طرق وأساليب التوثيق التاريخي.
Week 16	Preparatory week before the final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	ارشيف مؤسسة الشهداء	Yes
Recommended Texts	احسان هندي ،قوانين الاحتلال الحربي ، حقوق السكان المدنين في المناطق المحتلة وحمايتها الادارة السياسية دمشق ١٩٧٢ منهاج وزارة التعليم العالي والبحث العلمي / جرائم نظام البعث في العراق ٢٠٢٣ـ٢٠٢٤	Yes
Websites		

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

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

Contact

Program Manager:

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

ACADEMIC DESCRIPTION CURRICULUM FOR THE THIRD STAGE (5th Semester)

MODULE DESCRIPTION FORM
نموذج وصف المادة الدراسية

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

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