	Ministry of Higher Education and Scientific Research - Iraq University of Technology Department of Laser and Optoelectronics Engineering Laser Engineering Branch	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	ELECTRONIC CIRCUITS I		**Module Delivery**	
Module Type	CORE		**Theory** **Lecture** **Lab** **Reports**	
Module Code	LOEC211			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	2	**Semester of Delivery**	1	
Administering Department	Laser & Optoelectronics	**College**	LOE	
Module Leader	Dr. Jassim K. Hmood	**e-mail**	Jassim.k.hmood@uotechnology.edu.iq	
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor	None	**e-mail**	None	
Peer Reviewer Name		**e-mail**		
Review Committee Approval		**Version Number**	1.0	

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	

Co-requisites module	None	**Semester**	

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

Module Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of Electronic circuits theory through the application of techniques. 2. To understand how the diode can rectify the voltage, current and then build the DC power supply. 3. This course deals with the basic concept of electronic amplifiers circuits using transistors.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how semiconductor used to fabricate the electronics devices such as diodes and transistors. 2. Design and analyze simple circuits involving diodes, such as rectifiers and regulators. 3. Design and analyze simple linear amplifier circuits using bipolar junction and MOSFET transistors.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: <u>Part A – Diodes and Diode circuits</u> Diodes and Diode circuits: Semiconductor, Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. <u>Part B – Transistor and Transistor circuits</u> Transistor and Transistor circuits: Transistor characteristics and equations. Transistor circuit configurations (common base, common collector and common emitter), load lines and Q-point. Single stage transistor amplifier.

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

Strategies	The main strategy that will be adopted in delivering this module is to encourage students to communicate effectively with a range of audiences by participating in the exercises. At the same time, refining and expanding their critical thinking skills are performed. 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. At end of course, the student is able to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	104	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	70	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	3, 6, 9, 12	LO #1, 2, 3, 6 and 7
	Assignments	2	10% (10)	2, 6, 11, 13	LO # 1-4, 6 and 8
	Lab.	1	15% (15)	Continuous	
	Report	1	5% (5)	13	One of LO #1-8
Summative assessment	**Midterm Exam**	1 hr	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	p-n junction diode and its Characteristics
Week 2	Diode rectifier “Halve-wave and Full-wave rectifiers”
Week 3	Clipping and clamping Circuits
Week 4	Zener diode and Voltage stabilization
Week 5	Bipolar junction transistor and its Characteristics

Week 6	Field Effect transistors and Their Characteristics
Week 7	**Mid-term Exam**
Week 8	JFET and MOSFET Transistors
Week 9	Transistor circuit configurations
Week 10	Biasing and Q-point
Week 11	dc-load line and ac-load line
Week 12	Transistor amplifiers
Week 13	Frequency Response of Amplifiers- low frequency
Week 14	Frequency Response of common-high frequency
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: diode characteristics
Week 2	Lab 2: Half-wave diode rectifiers
Week 3	Lab 3: Full-wave diode rectifiers
Week 4	Lab 4: Clipping circuits
Week 5	Lab 5: Clamping circuits
Week 6	Lab 6: Zener Diode characteristics
Week 7	**Mid Term Exam**
Week 8	Lab 7: Voltage stabilization
Week 9	Lab 8: Transistor characteristics
Week 10	Lab 9: dc-load line and Q-point
Week 11	Lab 10: ac-load line
Week 12	Lab 11: Common emitter Transistor amplifier
Week 13	Lab 12: Frequency Response of amplifiers-part 1
Week 14	Lab 12: Frequency Response of amplifiers-part 2

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Electronic-Devices-and-Circuit-Theory-11th-Edition-Ebook	Yes
Recommended Texts	Microelectronic Circuits (6th edition) by Sedra and Smith	No
Websites		

APPENDIX:

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

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

Ministry of Higher Education and Scientific Research - Iraq
University of Technology
Department of Laser & Optoelectronic Engineering

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	MATHEMATICS III	**Module Delivery**	
Module Type	SUPLEMENT	**Theory** **Lecture** **Tutorial**	
Module Code	LOEC213		
ECTS Credits	4		
SWL (hr/sem)	100		
Module Level	2	**Semester of Delivery**	3
Administering Department	Laser and Optoelectronics	**College**	Laser and Optoelectronics Engineering
Module Leader	AHMED WAEL	**e-mail**	Ahmed.w.abdulwahhab@uotechnology.edu.iq
Module Leader's Acad. Title	Assist. Prof.	**Module Leader's Qualification**	M.Sc.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	02/09/2024	**Version Number**	1

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 Aims أهداف المادة الدراسية	1. Use principles of vectors algebra and related theories to solve equations of 2D and 3D spaces. 2. Calculate the partial differential equations and integration of multiple orders and parameters
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Use fundamental concepts to form vector's notation and doing their algebraic. 2. Apply vector's algebra to understand vectors in three-dimensional space. 3. Apply integration and derivation to calculate vectors function in space. 4. Understanding the concept of multiple variable functions, their limits and continuity. 5. Apply derivation on multiple independent variable functions in term of partial derivatives. 6. Apply PD concepts to solve problems to find tangent planes, gradient of vectors, divergence, and maximum and minimum values. 7. Solving equation includes of double and triple integrals 8. Apply all multivariable principle to understand vector theories
Indicative Contents المحتويات الإرشادية	Attending lecture is compulsory and intended to help you understand the topics in the module. Any other textbooks and/or website can also be used to improve student skills in mathematics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Formative Assessment: Use quizzes, in-class exercises to gauge students' understanding regularly. This can help identify areas where students are struggling and adjust teaching accordingly. Feedback and Reflection: Provide timely feedback on assignments and exams. Encourage students to reflect on their mistakes and understand the correct solutions. Active Learning: Engage students in problem-solving activities, group work, and discussions. Encourage them to solve problems collaboratively and explain their reasoning to peers. Practice and Application: Regular practice is crucial for mastering vectors and

	partial derivatives. Work through a variety of problems, from basic exercises to more complex applications. This helps build proficiency and confidence

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	31	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	69	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	
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**	5	25% (5)	3, 6, 10, 11, 14	1, 2 and 3, 4 and 5, 6, 7
	Assignments	2	10% (5)	7, 12	All
	Projects / Lab.	1	5% (5)	13	All
	Report	-	-		
Summative assessment	**Midterm Exam**	1 hr	10 % (10)	8	All
	Final Exam	3 hr	50 % (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Vectors and Geometry of Space: Vectors Representation, Vectors Algebra
Week 2	Vectors and Geometry of Space: Rectangular Coordinate System
Week 3	Vectors and Geometry of Space: Rectangular Coordinate System
Week 4	Vectors and Geometry of Space: Polar Coordinate System
Week 5	Vectors and Geometry of Space: Polar Coordinate System
Week 6	Vectors and Geometry of Space: Equations of Lines and Planes
Week 7	Multivariable Calculus: Definition of Multiple Variable Functions
Week 8	**Mid Term Exam**
Week 9	Multivariable Calculus: Tangent Planes and Linear Approximation
Week 10	Multivariable Calculus: Gradient and Directive Derivatives
Week 11	Multivariable Calculus: Chain Rule and Directive Derivatives
Week 12	Multivariable Calculus: Double and Triple Integral over General Region in Space

Week 13	Multivariable Calculus: Double and Triple Integral over Polar Coordinates
Week 14	Vector Theory: Line and Surface Integrals
Week 15	Vector Theory: Curl and Divergence theorem
Week 16	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Calculus, James Stewart, 8TH Edition, 2016	No
Recommended Texts	Calculus, James Stewart, 8TH Edition, 2016	No
Websites		

APPENDIX:

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

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	Ministry of Higher Education and Scientific Research - Iraq University of Technology Laser and Optoelectronics Engineering Department	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	BIOLOGY			**Module Delivery**	
Module Type	SUPLEMENT			**Theory Lecture**	
Module Code	LOEC214				
ECTS Credits	4				
SWL (hr/sem)	100				
Module Level	2		**Semester of Delivery**	3	
Administering Department	Laser & Optoelectronics		**College**	LOE	
Module Leader	Dr. Kareem Hussein Jawad		**e-mail**	Kareem.h.jawad@uotechnollogy .edu.iq	
Module Leader's Acad. Title	Asst. Prof.		**Module Leader's Qualification**	PhD	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Review Committee Approval			**Version Number**	1.0	

Relation with Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1. The aim of this Module is to introduce the fundamental concepts of biology in a theoretical context.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Students will be able to describe living systems, including their nature, organization and evolution 2. Students will be able to apply methods of scientific inquiry in biology 3. Students will be able to describe how human activities affect the living world and the physical environment 4. Students will be able to describe the flow of energy and matter within and among organisms 5. Students will be able to explain the historical context of biological discoveries 6. Students will be able to evaluate information by discriminating between science and non-science 7. Students will be able to evaluate and interpret quantitative data using the scientific method 8. Students will be able to practice safety and proper techniques in the laboratory 9. Students will be able to write accurately and clearly about biology topics 10. Students will be able to explain why science is an integral activity for addressing social and environmental problems 11. Students will be able to describe the diversity of life 12. The major types of molecules that make up living organisms and how these molecules enable life functions. 13. The structures found in cells and the functions of those sub-cellular structures. 14. He directs effects that biological diversity has on ecosystem services and humans. 15. How humans depend on ecosystems for their health and well-being.		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Structure and morphology of the cell 2hr Macromolecules, structure and function 2hr Biological membranes; membrane transport 2hr cell formation 2hr Basics of energy metabolism 2hr		

	Methods of cell biology 2hr brief history of science and biology 2hr The scientific method 2hr The framework of biology (levels of organization) 2hr The cell theory 2hr Organization and structure of the cell 2hr Cell metabolism 2hr Cell wall of bacteria in both type positive bacteria and negative bacteria 4hr Type of growth 2hr Note: To indicative contents Required texts of biology

Learning and Teaching Strategies
استراتيجيات التعلم والتعليم

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

Student Workload (SWL)
الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	31	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	69	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	2	20% (20)	5, 10	LO #1, 2
	Assignments	1	5% (5)	2	LO # 3
	Seminar	1	10% (10)	3	LO # 3
	Report	1	5% (5)	13	LO # 5
Summative assessment	**Midterm Exam**	1 hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - The cell (A tour of the cell) Membrane structure and function
Week 2	An introduction to metabolism cell communication
Week 3	The cell cycle
Week 4	microbiology.
Week 5	Microscope parts and type.
Week 6	Classification and taxonomy. (Eukaryotic cell and prokaryotic cell).
Week 7	Bacterial cell structure. Cell type Shape
Week 8	MID TERM EXAM
Week 9	Cell wall of gram negative bacteria Cell wall of gram positive bacteria Bacterial nutrition and growth
Week 10	Type of nutrition Type of growth
Week 11	Example of gram positive bacteria Example of gram negative bacteria
Week 12	Virology
Week 13	Parasitology
Week 14	Mycology
Week 15	**Final Exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- Campbell biology / Lisa Urry, Michael Cain, Steven Wasserman, Peter Minorsky, Jane Reece. 2- Biology (Third Edition) George H. Fried, Ph.D. Professor of Biology. Brooklyn College George J. Hademenos, Ph.D. Former Visiting Assistant Professor Department of Physics University of Dallas	No
Recommended Texts	3- Medical Microbiology Jawetz, Melnick, & Adelberg's.	No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	**Grade**	التقدير	**Marks (%)**	**Definition**
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	Ministry of Higher Education and Scientific Research - Iraq University of Technology Department of Laser and Optoelectronics Engineering	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	CRIMES OF THE BAATH REGIME IN IRAQ	**Module Delivery**	
Module Type	SUPLEMENT	**Theory** **Lecture** **Seminar**	
Module Code	CBRI201		
ECTS Credits	2		
SWL (hr/sem)	50		
Module Level	2	**Semester of Delivery**	3
Administering Department	Laser & Optoelectronics	**College**	LOE
Module Leader	Dr. Faiz W. Yakoob	**e-mail**	fais.w.yakoob@uotechnology.edu.iq
Module Leader's Acad. Title	Professor	**Module Leader's Qualification**	Ph.D.
Module Tutor	None	**e-mail**	None
Peer Reviewer Name	None	**e-mail**	None
Review Committee Approval	01/09/2024	**Version Number**	1.0

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	1. يهدف المنهج الى توفير شامل لمفهوم جرائم نظام البعث في العراق بما في ذلك مفهوم الجرائم واقسامها والتعريف بالجريمة واقسامها وانواعها. 2. توضيح جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية عام2005 التي من خلالها يتعرف الطالب على تلك الجرائم التي ارتكبت من قبل نظام البعث كذلك التعرف على انواع الجرائم الدولية والقرارات الصادرة من المحكمة الجنائية العليا لجرائم نظام البعث في العراق. 3. تعريف الطالب بالجرائم والانتهاكات التي ارتكبها نظام البعث في العراق منها الجرائم النفسية و الاجتماعية وأثارها والجرائم البيئية وجرائم المقابر الجماعية و الانتهاكات السياسية والعسكرية.		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. سوف يكتشف الطلاب الجرائم و أنواعها التي ارتكبت في العراق من قبل نظام البعث من خلال دراسة الجرائم التي تم توثيقها وفق قانون المحكمة الجنائية العراقية عام 2005 . 2. فهم دور و علاقة نظام البعث في الجرائم و السياسية التي كان يمارسها على الشعب وتأثير تلك الجرائم والسياسات على المجتمع من حلال بيان نوع الجرائم الدولية والقرارات الصادرة من المحكمة الجنائية العليا و الانتهاكات السياسية والعسكرية لنظام البعث. 3. التعرف الى جرائم نظام البعث النفسية والاجتماعية و جرائم البيئة وجرائم المقابر الجماعية .		
Indicative Contents المحتويات الإرشادية	يتضمن المحتوى الارشادي المحاور الموضوعية الاساسية وكما يلي _ جرائم نظام البعث وفق قانون المملكة الجنائية العراقية العليا عام 2005 _ الجرائم النفسية الاجتماعية واثارها وابرز انتهاكات النظام البعثي في العراق _ الجرائم البيئية لنظام البعث في العراق _ المقابر الجماعية		
Learning and Teaching Strategies استراتيجيات التعلم والتعليم			
Strategies	تعتبر جرائم حزب البعث في العراق من ابرز واكثر الجرائم التي ارتكبت من نظام البعث في العراق والتي تم توثيقها وفق قانون المحكمة الجنائية عام 2005 والتي تشمل انواع واقسام وصور لتلك الجرائم التي كانت تصنف على انها جرائم نفسية واجتماعية و سياسية , كذلك من الجرائم التي تم ارتكابها هي الجرائم التي عملت على التلوث الحربي والاشعاعي وتدمير المدن والقرى وتجفيف الاهوار وتجريف البساتين واخرها جرائم المقابر الجماعية.		

Student Workload (SWL) الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	33	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	17	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	1.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	50		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	جرائم نظام البعث وفق قانون المحكمة الجنائية العراقية العليا عام 2005, مفهوم الجرائم ، تعريف الجريمة لغة واصطلاحا، وبيان اقسام الجرائم,
Week 2	جرائم نظام البعث وفق توثيق قانون المحكمة الجنائية العراقية العليا عام ٢٠٠٥ ، انواع الجرائم الدولية ، والقرارات الصادرة من المحكمة الجنائية العليا
Week 3	تكليف كل طالب بكتابة بحث عن الفصل الاول وقراءة جزء منه ويناقش من قبل باقي الطلبة كتقييم لمن يسأل ويجيب
Week 4	الجرائم النفسية والاجتماعية وأثارها، وأبرز انتهاكات النظام البعثي في العراق, الجرائم النفسية ,اليات الجرائم واثارها النفسية ,الجرائم الاجتماعية وعسكرة المجتمع وبيان موقف النظام من الدين
Week 5	انتهاكات القوانين العراقية ، صور انتهاكات حقوق الإنسان وجرائم السلطة ، بعض قرارات الانتهاكات السياسية والعسكرية لنظام البعث ، أماكن السجون والاحتجاز لنظام البعث
Week 6	تكليف كل طالب بكتابة بحث عن الفصل الاول وقراءة جزء منه ويناقش من قبل باقي الطلبة كتقييم لمن يسأل ويجيب
Week 7	الجرائم البيئية لنظام البعث في العراق ، التلوث الحربي والإشعاعي وانفجار الالغام ، تدمير المدن والقرى ،
Week 8	تجفيف الاهوار ، تجريف البساتين
Week 9	عمل امتحان يومي للطلبة بالفصل الاول والثاني ومراجعة المادة
Week 10	تكليف كل طالب بكتابة بحث عن المادة وقراءة جزء منه ويناقش من قبل باقي الطلبة كتقييم لمن يسأل ويجيب
Week 11	جرائم المقابر الجماعية
Week 12	احداث مقابر الابادة الجماعية المرتكبة من النظام البعثي في العراق. والتصنيف الزمني للمقابر في العراق للمدة 1963م -2003م
Week 13	عمل امتحان يومي للطلاب في بمواضيع الفصل الرابع
Week 14	عمل مراجعة شاملة للمادة الدراسية , و اشراك الطلبة في النقاشات والاسئلة

Week 15	اكمال متطلبات البحوث والتقارير وعمل امتحان يومي بالمادة الدراسية
Week 16	امتحان نهائي

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	جرائم نظام البعث في العراق	نعم
Recommended Texts		نعم
Websites		

APPENDIX:

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

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

	Ministry of Higher Education and Scientific Research - Iraq University of Baghdad College of Engineering Department of Electrical Engineering	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	ENGINEERING OPTICS		**Module Delivery**	
Module Type	CORE		**Theory** **Lecture** **Lab** **Tutorial** **Practical** **Seminar**	
Module Code	LOEC214			
ECTS Credits	6			
SWL (hr/sem)	150			
Module Level	2	**Semester of Delivery**	3	
Administering Department	Laser & Optoelectronics	**College**	LOE	
Module Leader	Dr. Aseel al-shrify	**e-mail**	Aseel.A.Alsharify@uotechnology.edu.iq	
Module Leader's Acad. Title	A.Professor	**Module Leader's Qualification**	Ph.D.	
Module Tutor	None	**e-mail**	None	
Peer Reviewer Name		**e-mail**		
Review Committee Approval	01/06/2023	**Version Number**	1.0	

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	

Co-requisites module	None	Semester	

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

Module Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of engineering optics theory through different side of applications and technique. 2. To understand how electromagnetic waves interact with diverse optical equipment and systems. 3. This course deals with the basic concept of engineering optical systems. 4. This is the basic subject for all optical system analysis. 5. To understand different optical system design and analysis problems. 6. To perform different optical phenomena analysis .
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how optical wave transfer in any optical system. 2. List the various terms related to the optical system. 3. Summarize what is meant by a basic optical system. 4. Discuss the reaction and involvement of optical signal in optical system. 5. Describe optical signal ,photons and material refractive index . 6. Define snells law, Fermat principle and interference, diffraction and scattering concept. 7. Identify the basic optical system items and their applications. 8. Discuss the optical operations in the optical system. 9. Discuss the various properties of spherical optical surfaces, beam splitter and optical interferometer systems. 10. Explain the Fermat's principal, paraxial approximation and snells laws in different optical system analysis.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A – geometric optics theory</u> The treatment of light as wave motion allows for a region of approximation in which the wavelength is considered to be negligible compared with the dimensions of the relevant components of the optical system. This region of approximation is called geometrical optics by which one can understand different important optical concept. [12 hrs]

	Matrix Methods in Paraxial Optics –which deals with methods of analyzing optical systems when they become complex, involving a number of refracting and/or reflecting elements in train like fashion. Beginning with a description of a single thick lens in terms of its cardinal points, the discussion proceeds to an analysis of a train of optical elements by means of multiplication of matrices representing the elementary refractions or Reflections involved in the train. [12 hrs] Optical Instrumentation – this discuss several practical optical instruments. The discussion begins with an introduction to the operation of stops, pupils, and windows, of great practical importance to optical instrumentation. The optical instruments treated in the following articles then include the prism, the camera, the eyepiece, the microscope, and the tele-scope. [12 hrs] Interference of Light - the phenomenon of interference depends on the superposition of two or more individual waves under rather strict conditions that will soon be clarified. When interest lies primarily in the effects of enhancement or diminution of light waves, due precisely to their superposition, these effects are usually said to be due to the interference of light. When enhancement, or constructive interference, and diminution, or destructive interference, conditions alternate in a spatial display, the interference is said to produce a pattern of fringes, as in the double-slit interference pattern. [12 hrs] Revision problem classes [6 hrs] Optical Interferometry: This general description of the instrument should reflect the wide variety of designs and uses of interferometers. Applications extend also to acoustic and radio waves, but here we are interested in the optical interferometer. In this part we discuss chiefly the Michelson and the Fabry-Perot interferometers and suggest only a few of their many applications. [12 hrs] Fraunhofer Diffraction – If both the source of light and observation screen are effectively far enough from the diffraction aperture so that wave fronts arriving at the aperture and observation screen may be considered plane, we speak of Fraunhofer, or far-field, diffraction that's we deal with in this part. [12 hrs] The Diffraction Grating – The diffraction grating equation is first generalized to handle light beams incident on the grating at an arbitrary angle. Performance parameters of practical interest are then developed in discussions of the spectral range, dispersion, resolution, and blaze of a grating. A brief discussion of interference gratings and several conventional types of grating spectrographs follows. [12 hrs]

	Fresnel Diffraction -Fresnel diffraction patterns form a continuity between the patterns characterizing geometrical optics at one extreme and Fraunhofer diffraction at the other. [12 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			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	102	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	98	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
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**	4	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	4	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Lab	1	15% (10)	Continuous	
	Report	1	5% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	1hr	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 , basics and concepts of engineering optics theory
Week 2	Ray tracing analysis in different optical systems
Week 3	Optical ray tracing matrix of any reflective and refractive element
Week 4	An introduction to Optical Instrumentation (stop, pupile,windows)
Week 5	Variations of optical instruments include the prism, the camera, the eyepiece, the microscope, and the tele-scope.
Week 6	Interference of Light
Week 7	An introduction and analysis of Optical Interferometry
Week 8	Discussion of the Michelson and the Fabry-Perot interferometers and suggest only a few of their many applications.
Week 9	Fraunhofer Diffraction
Week 10	Analysis and operations of the Diffraction Grating
Week 11	A brief discussion of interference gratings and several conventional types of grating spectrographs.
Week 12	Fresnel Diffraction.
Week 13	Theory of Multilayers Films
Week 14	Fresnel equations and their relations to (phase changes on reflection, conservation of energy, evanescent waves and complex refractive index)
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Measurement of refractive index of glass and water by using traveling telescope
Week 2	Lenses
Week 3	mirrors
Week 4	Monochromatic by double slit diffraction pattern
Week 5	diffraction grating
Week 6	prism
Week 7	dispersive power of prism

Week 8	beam expander
Week 9	Monochromatic by single slit diffraction pattern
Week 10	total reflection
Week 11	microscope
Week 12	total internal reflection
Week13	Michelson interferometers

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Introduction to Optics: FRANK L. PEDROTTI, S.	Yes
Recommended Texts	Geometric optics .E. R. Huggins	yes

APPENDIX:

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

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

	Ministry of Higher Education and Scientific Research - Iraq University of Technology Department of Laser and Optoelectronics Engineering	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية				
Module Title	COMPUTER APPLICATION AND ARTIFICIAL INTELLIGENCE		**Module Delivery**	
Module Type	SUPLEMENT			
Module Code	LOEC227			
ECTS Credits	3			
SWL (hr/sem)	75			
Module Level	2		**Semester of Delivery**	3
Administering Department	Type Dept. Code		**College**	Type College Code
Module Leader			**e-mail**	
Module Leader's Acad. Title			**Module Leader's Qualification**	
Module Tutor	None		**e-mail**	
Peer Reviewer Name			**e-mail**	
Review Committee Approval			**Version Number**	

Relation With Other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To familiarize students with the MATLAB environment, including its interface and basic functionalities. 2. To develop students' programming skills in MATLAB by teaching essential programming constructs such as loops, conditionals and functions. 3. To equip students with the skills needed to effectively visualize data using MATLAB's plotting functions. 4. To enhance students' ability to manage and manipulate complex data structures in MATLAB, including arrays, cell arrays, tables, and structures. 5. To teach students basic signal processing techniques, such as Fast Fourier Transform (FFT) and filtering. 6. To introduce students to fundamental image processing techniques, including image representation, filtering, and transformations. 7. To provide students with an overview of artificial intelligence (AI) concepts and methodologies. 8. To introduce students to the principles of neural networks, including their architecture, training, and evaluation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. familiarize students with the MATLAB interface and basic commands. 2. students can create and manipulate arrays, cell arrays, tables, and structures. 3. students understand matrix concepts and operations 4. students understand signal processing concepts and their applications. 5. Student develop skills in processing and analyzing images 6. Guide students through building and evaluating basic machine learning models using MATLAB 7. students can evaluate deep learning models and interpret their performance metrics.
Indicative Contents المحتويات الإرشادية	1- **MATLAB Environment:** Overview of the MATLAB interface, command window, workspace, and editor. 2- **Matrix Operations:** Addition, multiplication, inversion, and decomposition. 3- **Plotting Basics:** Creating 2D and 3D plots using `plot`, `scatter`, `bar`, and `hist`. 4- **Data Structures:** Arrays, cell arrays, tables, and structures. 5- **Control Structures:** Loops (for, while) and conditional statements (if, else, switch). 6- **Fourier Transform:** Introduction to the Fast Fourier Transform (FFT) and its applications. 7- **Image Representation:** Understanding image formats and how images are represented in MATLAB. 8- **AI Overview:** Basic concepts and methodologies in artificial intelligence 9- **Neural Network Basics:** Introduction to neural networks, including architecture

	and training. 10- **Deep Learning Concepts:** Introduction to deep learning, including deep neural networks and convolutional networks.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	- Interactive Tutorials - Hands-On Practice - Programming Exercises - Case Studies

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	31	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	44	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	75		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	10%	2,4,7,9	
	Assignments	4	10%	,2,45,11	
	Lab.	1	15%	continuous	
	Report	1	5%	10	
Summative assessment	**Midterm Exam**	1 hr	10	8	
	Final Exam	3hr	50	15	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to MATLAB: Basics of MATLAB interface, variables, and data types
Week 2	Arithmetic operations with scalar
Week 3	Arithmetic operations with vectors , matrices
Week 4	Data Visualization: Plotting (2D), customizing plots, and data visualization tools
Week 5	Data Visualization: Plotting (3D), customizing plots, and data visualization tools
Week 6	Control structures (loops, conditionals), functions, and scripts/Conditional statement: if, switch
Week 7	Control structures (loops, conditionals), functions, and scripts/For – end loop with series , While – end loop with series
Week 8	Signal Processing Basics: FFT, filtering, and basic signal analysis techniques
Week 9	Image Processing Basics: Image representation, basic operations (filtering, transformations)
Week 10	Introduction to AI: Basics of AI concepts, machine learning overview
Week 11	Implementing basic machine learning algorithms (e.g., linear regression)
Week 12	Neural Networks: Introduction to neural networks
Week 13	Neural Networks: training, and evaluation
Week 14	Deep Learning Fundamentals : basics of deep learning, simple neural network models
Week 15	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	"MATLAB for Engineers" by Holly Moore	
Recommended Texts		
Websites		

APPENDIX:

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

Note:

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

	Ministry of Higher Education and Scientific Research - Iraq University of Technology Department of Laser and Optoelectronics Engineering	

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	DIGITAL ELECTRONICS		**Module Delivery**	
Module Type	CORE		**Theory Lecture and Lab.**	
Module Code	LOEC215			
ECTS Credits	4			
SWL (hr/sem)	100			
Module Level	2	**Semester of Delivery**	1	
Administering Department	Laser and Optoelectronics Engineering	**College**	LOE	
Module Leader	Dr. Taif Aied Faisal	**e-mail**	Taif.a.faisal@uotechnology.edu.iq	
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.	
Module Tutor	None	**e-mail**	None	
Peer Reviewer Name		**e-mail**		
Review Committee Approval		**Version Number**	1.0	

Relation With Other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	None	**Semester**	
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. Providing students with a general knowledge of digital electronics and their scientific applications 2. Equipping students with the essential tools for digital circuit analysis. 3. Fostering understanding through real-world digital applications
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Applying implementation of digital circuits and critical thinking skills 2. Support mental ability to understand basic digital design 3. Support strategies for complex digital design 4. Support Application and software skills and implementation 5. Apply Knowledge to everyday life events 6. Apply knowledge to different scientific realms
Indicative Contents المحتويات الإرشادية	Careful use of digital electronic kits Abiding by the rules and regulations of lab safety instructions
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. 1. Develop problem-solving techniques needed to accurately solve digital problems. 2. Apply problem-solving techniques to solving real-world applications 3. Apply selected theories to solve problems 4. Present the analysis of digital circuits to all audiences

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	60	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	4
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	40	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.85
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**	4	10% (10)	3, 6, 9, 12	LO #1, 2, 3, 6 and 7
	Assignments	4	10% (10)	2, 6, 11, 13	LO # 1-4, 6 and 8
	Lab.	1	15% (15)	Continuous	
	Report	1	5% (5)	13	One of LO #1-8
Summative assessment	**Midterm Exam**	1 hr	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	- Digital Concepts
Week 2	- Number System Arithmetic
Week 3	- Logic Gates and their Applications
Week 4	- Boolean Algebra
Week 5	- Logic Simplification
Week 6	- Combinational Logic Analysis
Week 7	- Functions of Combinational Logic I
Week 8	**Midterm Exam**
Week 9	- Functions of Combinational Logic II
Week 10	- Sequential Circuits I
Week 11	- Sequential Circuits II
Week 12	- Counters I
Week 13	- Counters II

Week 14	- Data Storage
Week 15	**Preparatory Week**
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to lab and general guidelines
Week 2	Logic Gates
Week 3	Boolean Algebra Application
Week 4	Combinational Logic
Week 5	Half Adder
Week 6	Full Adder
Week 7	Decoders and Encoders
Week 8	**Mid Term**
Week 9	Multiplexer and Demultiplexer
Week 10	Flip Flops
Week 11	Counters I
Week 12	Counters II
Week 13	Simulation of Digital Circuits I
Week 14	Simulation of Digital Circuits II

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	-Thomas Floyd, "Digital Fundamentals", 11th edition, Pearson, 2015	Yes
Recommended Texts	-Samuel C. Lee "Digital Circuits and Logic Design" 1st edition, Prentice-Hall, 1976. -M. Morris Mano, "Digital Design", 4th edition, Prentice Hall, 1995	Yes
Websites	https://www.youtube.com/@khanacademypartners6264	

APPENDIX:

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

Note:

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