



Ministry of Higher Education and
Scientific Research - Iraq
Al-Nahrain University
College of Science
Computer Science Department



MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	ELECTRONIC PHYSICS		Module Delivery
Module Type	SUPPLEMENT		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	CREQ1110		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	Computer Science	College	Science
Module Leader	Mohammed Sahib Mahdi	e-mail	Mohammed.sahibmahdi@nahrainuniv.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	Ph.D.
Module Tutor	None	e-mail	None
Peer Reviewer Name	AbdulKareem Merhej	e-mail	abdulkareemmerhij@nahrainuniv.edu.iq
Review Committee Approval	15/5/2023	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

<p>Module Aims أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. To understand the difference between the analog and digital concepts.2. How deal with analog and digital concepts.3. To train on diode structure, biasing types, current and voltage characteristics of diodes.4. To improve some common application circuits of diodes.5. To perform bipolar transistors, and switch transistor and how its converted into logic gate.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none">1. Define the problem (input and output), and write its functions.2. Estimate both the current and voltage of the diode contributed in electronic circuit.3. Sketch the I-V characteristics curve of the diode and can determine the operation point of such diode.4. Design simple circuit for given application.5. Understand structure, operation, and functions of the transistor.6. Understand how converts the transistor to be digital logic gate.
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following: This module introduces the student to understand the difference between the analog and digital concepts. [25 hrs] How analog to digital conversion process is performed and what specification is needed. [25 hrs] Other topics include: general view on diode structure, biasing types, current and voltage characteristics of diodes. [25 hrs] Some common application circuits of diodes such as regular, rectifier, and limiter are demonstrated. Bipolar transistor is given including: structure, common configuration, switch transistor and how its converted into logic gate. [25 hrs]</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies

The length of the semester is 16 weeks, including the exam, and there will be approximately 10² hours dedicated to teaching the student the theoretical and practical foundations of the subject of the course, including the theoretical subject, which will take a period of 30 lecture hours (3 hours per week) and a practical subject of 30 hours during the course (two hours per week). Two hours are devoted to the mid-term exam, three hours for short exams that extend from the middle to the end of the course, then 20 hours for seminars, homework and the like.

Student Workload (SWL)

الحمل الدراسي للطالب

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	63	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	62	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.13
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation

تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)

المنهاج الأسبوعي النظري

Material Covered	
Week 1	Analog and Digital Concepts.

Week 2	Analog and Digital Circuits, Electronic Signal, Analog and Digital Signals.
Week 3	A\D Conversion, Sampling and quantization, PCM
Week 4	Conductors, Semiconductors, and Isolators, P-N Junction, Potential barrier of diode.
Week 5	Reverse biasing diode, Reverse Breakdown of a diode, Forward biasing diode.
Week 6	I-V characteristics of diode, Diode circuit analysis, load line method, approximation method.
Week 7	Zener diode specification and rates, Voltage regular, Positive/negative half wave rectifier, Full wave rectifier.
Week 8	Two sources circuits, Voltage limiter, Lights emitting diode (LEDs).
Week 9	Bipolar transistor structure, Bipolar transistor operation.
Week 10	Common-base configuration, Common-base characteristics.
Week 11	Common-collector configuration, Common-collector characteristics.
Week 12	Common-emitter configuration, Common-emitter characteristics.
Week 13	Amplifiers.
Week 14	Switch transistor (saturation and cutoff states), Switching circuit application.
Week 15	Final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Electronic Signals.
Week 2	Lab 2: Diode biasing.
Week 3	Lab 3: Voltage regular, Positive/negative half wave rectifier, Full wave rectifier.
Week 4	Lab 4: Voltage regular.
Week 5	Lab 5: Positive/negative half wave rectifier.
Week 6	Lab 6: Full wave rectifier.
Week 7	Lab 7: Common-collector configuration.
Week 8	Lab 8: Common-emitter configuration.
Week 9	Lab 9: Common-Base configuration.
Week 10	Lab 10: Amplifiers.
Week 11	Lab 11: Switching circuit application.
Week 12	Lab 12: Switching circuit Primary logic circuits.
Week 13	Lab 13: Switching circuit logic circuits.

Week 14	Lab 14: Transistor (saturation and cutoff states).
Week 15	Lab 15: Switching circuit applications.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Morris Mano, Charles R. Kime, "Logic and Computer Design Fundamentals", Pearson Prentice Hall, 2004.	Yes
Recommended Texts	John F. Wakerly "Digital Design: Principles and Practices Package" 4 th edition, Prentice-Hall, 2007.	Yes
Websites	https://sc.nahrainuniv.edu.iq/computers/comp_102.pdf	

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.



ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديرية ضمان الجودة في وزارة التعليم العالي والبحث العلمي.