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

MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	ELECTRONICS			**Module Delivery**	
Module Type	SUPLEMENT			☒**Theory** ☒**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☒**Seminar**	
Module Code	CRELE				
ECTS Credits	5				
SWL (hr/sem)	100				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Computer Science		**College**	Science	
Module Leader	Mohammed Sahib Mahdi Zina Muafiq + Wasan Ali		**e-mail**	Mohammed.sahibmahdi@nahrainunive.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	None		**e-mail**	None	
Peer Reviewer Name	AbdulKareem Merhij		**e-mail**	abdulkareemmerhij@nahrainunive.edu.iq	
Review Committee Approval	1/9/2025		**Version Number**	1.0	

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

Co-requisites module	None	**Semester**	

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

Module Aims أهداف المادة الدراسية	This module introduces the student to understand the difference between the analog and digital concepts, how analog to digital conversion process is performed and what specification is needed. Other topics include: general view on diode structure, biasing types, current and voltage characteristics of diodes. Then, some common application circuits of diodes such as regular, rectifier, and limiter are demonstrated. Later, bipolar transistor is given including; structure, common configuration, switch transistor and how its converted into logic gate.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	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.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: This module introduces the student to understand the digital circuits. [25 hrs] Digital circuits design in computers. [25 hrs] Other topics include: logic circuits, flip flop, registers, RAM. [25 hrs] Some common application circuits of digital RAM types are demonstrated. [25 hrs]

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 45 lecture hours (three 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 أسبوعيا	4.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	37	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	100		

Module Evaluation
تقييم المادة الدراسية

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

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Analog and Digital Concepts.
Week 2	Electronic Signal. Analog and Digital Signals.
Week 3	A\D Conversion. Sampling and quantization. PCM
Week 4	Conductors, Semiconductors, and Isolators. P-N Junction.
Week 5	Potential barrier of diode. Reverse biasing diode. Reverse Breakdown of a diode.
Week 6	Forward biasing diode. I-V characteristics of diode. Diode circuit analysis, load line method, approximation method. Zener diode.
Week 7	Zener diode specification and rates. Voltage regular. Positive/negative half wave rectifier.
Week 8	Full wave rectifier. Two sources circuits. Voltage limiter.
Week 9	Lights emitting diode (LEDs).
Week 10	Bipolar transistor structure. Bipolar transistor operation.
Week 11	Common-base configuration.
Week 12	Common-base characteristics.

Week 13	Common-collector configuration.
Week 14	Common-emitter configuration.
Week 15	Amplifier. Switch transistor (saturation and cutoff states). Switching circuit application.
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Analog and Digital Signals.
Week 2	Lab 2: Reverse biasing diode.
Week 3	Lab 3: Forward biasing diode.
Week 4	Lab 4: I-V characteristics of diode
Week 5	Lab 5: Diode circuit analysis
Week 6	Lab 6: load line method.
Week 7	Lab 7: approximation method.
Week 8	Lab 8: Zener diode.
Week 9	Lab 9: Voltage regular. Positive/negative half wave rectifier.
Week 10	Lab 10: Full wave rectifier. Voltage limiter.
Week 11	Lab 11: Lights emitting diode (LEDs).
Week 12	Lab 12: Bipolar transistor
Week 13	Lab 13: Common-base characteristics.
Week 14	Lab 14: Common-collector configuration.
Week 15	Lab 15: Common-emitter configuration.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Charles R. Kime, "Physical Electronic Principles", Pearson Prentice Hall,2012.	Yes

Recommended Texts	John F. Wakerly "Digital Design:Principles and Practices Package" 4th edition, Prentice-Hall, 2007.	Yes
Websites	https://sc.nahrainuniv.edu.iq/computers/comp_104.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