Ministry of Higher Education and
Scientific Research - Iraq
University of Diyala
College of Engineering
Department of Computer Engineering

الملحق ٤: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Electronic Physics**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☐ **Lab** ☐ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**CPE 108**				
ECTS Credits	**4**				
SWL (hr/sem)	**100**				
Module Level	1		**Semester of Delivery**	2	
Administering Department	Computer Eng.		**College**	College of Engineering	
Module Leader	Saad Mohammed Saleh		**e-mail**	saad.alazawi@uodiyala.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name	Name		**e-mail**	E-mail	
Scientific Committee Approval Date	10/06/2023		**Version Number**	1.0	

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

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives أهداف المادة الدراسية	1. To develop problem solving skills and understanding of electronic physics through the application of techniques. 2. To understand PN junction and diode operation. 3. This course deals with the applications of the diodes. 4. To understand the operation and construction of DC Power supply. 5. To understand the construction and operation of Logic gates circuits using diodes. 6. To understand the Zener diode operation and applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the atomic structure and the differences between conductors, insulators and semiconductors. 2. Learn the construction of intrinsic and extrinsic semiconductors. 3. Summarize the operation of diode and the diode characteristics. 4. Discuss the DC analysis of the diodes and the Diode models. 5. Understand the small signal diode model. 6. Explain other diode types. 7. Understand the operation and analysis of Diode rectifiers circuits. 8. Explain the operation and analysis of Clipping and Clamping Diode Circuits. 9. Understand the construction and operation of logic gates (AND/OR) using Diodes. 10. Explain the construction and operation of Zener Diode. 11. Understand the application of Zener diode in electronic circuits as a voltage regulator.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** Introduction: Overview about Insulators, Conductors, Semiconductors, Intrinsic and Extrinsic Semiconductors, P.N Junction; Forward and Reverse Biasing (9 hrs) Physical Operation of Diodes (Diode Characteristics), DC Analysis of the Diode, DC Load Line and Q-Point, Constant Voltage Drop Model, Piecewise Linear Diode Model, Small Signal Diode Model. (9 hrs) Other Diode types: The Schottky-Barrier Diode (SBD), Photodiodes, Light-Emitting Diodes (LEDs) (3 hrs) Diode Applications: Half Wave Rectifier, Centre Tapped Transformer Rectifier, Bridge Rectifier (6 hrs) The operation and analysis of Serial and parallel Clipping circuits and clamping circuits (6 hrs) Operation and analysis of the AND & OR Logic Gates using Diodes (3 hrs) DC Power supply construction and operation (3 hrs) Zener Diode construction, operation, circuits and applications (6 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, homework's and examples. Practical examples helps students to understand the course material.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	**48**	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	**3**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**52**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**3.5**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**100**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	**2**	**20% (20)**	**6 and 12**	**LO #1 to #4 and #6 to #8**
	Assignments	**3**	**20% (20)**	**4, 7 and 10**	**LO #2, #3, #4, #5 and #7,#8,#9**
	Projects / Lab.				
	Report				
Summative assessment	**Midterm Exam**	**2 hr**	**10% (10)**	**9**	**LO #1 - #7**
	Final Exam	**3 hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Overview about Insulators, Conductors, Semiconductors
Week 2	Intrinsic and Extrinsic Semiconductors.
Week 3	PN Junction; Forward and Reverse Biasing
Week 4	Physical Operation of Diodes (Diode Characteristics)
Week 5	The DC Analysis of the Diode
Week 6	The Small Signal Diode Model
Week 7	Other Diode types
Week 8	Half Wave Rectifiers
Week 9	Full Wave Rectifiers
Week 10	Clipping Circuits
Week 11	Clamping Circuits
Week 12	Operation and analysis of the AND & OR Logic Gates using Diodes
Week 13	Power Supply Construction
Week 14	Zener Diode Construction and Operation
Week 15	Zener Diodes Applications and Circuits
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	

Week 7	

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Robert L. Boylestad and Louis Nashelsky, Electronic Devices and Circuit Theory, 7th or 10th or 11th Edition.	Yes
Recommended Texts	• Sedra and Smith, *Microelectronic Circuits*, Oxford University Press, *Sixth Edition*,2010 • Behzad Razavi, *Fundamentals of Microelectronics*, John Wiley & Sons, Preview Edition, 2006 • Jimmie J. Cathey, PhD, *Theory and Problems of Electronic Devices and Circuits*, 2nd Edition, 2002. • Any other materials available on the web.	No
Websites	https://youtube.com/playlist?list=PLo6jdcSSoHsKhiCJaZF9XZR9RRZas75HU	

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.