

وزارة التعليم العالي والبحث العلمي
جهاز الإشراف والتقويم العلمي
دائرة ضمان الجودة والاعتماد الأكاديمي

استمارة وصف البرنامج الأكاديمي للكليات والمعاهد

للعام الدراسي ٢٠٢٣-٢٠٢٤

الجامعة : تكريت

الكلية/ المعهد: كلية هندسة العمليات النفطية

القسم العلمي : هندسة سيطرة المنظومات النفطية

تاريخ ملء الملف : ٢٠٢٣/١١/٢٥

التوقيع :

اسم المعاون العلمي : أ.م.د. عمر ياسين ضايح

التاريخ : ٢٠٢٣/١٢/٣

التوقيع :

اسم رئيس القسم : م. ياسين خضر ياسين

التاريخ : ٢٠٢٣/١١/٢٨

دقق الملف من قبل

شعبة ضمان الجودة والأداء الجامعي

اسم مدير شعبة ضمان الجودة والأداء الجامعي: م.م. أيوب إبراهيم محمد

التاريخ : ٢٠٢٣/١١/٢٨

التوقيع :

مصادقة السيد العميد

أ.م.د. غسان حمد عبد الله

٢٠٢٣/١٢/٣

التوقيع :



Ministry of Higher Education and
Scientific Research - Iraq
University of Tikrit
College of Petroleum Process Engineering
Department of Petroleum System Control
Engineering



MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Physical Electronics		Module Delivery
Module Type	BASIC		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Tutorial
Module Code	PCS114		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	1	Semester of Delivery	
Administering Department	PCS	College	PPE
Module Leader	Omar Assi Hussein	e-mail	omar-assi81@tu.edu.iq
Module Leader's Acad. Title	Assistant Professor	Module Leader's Qualification	Ph.D.
Module Tutor	None	e-mail	None
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	08/06/2023	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	<ol style="list-style-type: none">1. To develop problem solving skills and understanding of electronics through the application of techniques.2. To understand voltage, current and power from a given circuit.3. Objectives lie in three separate areas of physical electronics.4. The first relates to the properties of semiconductors, the second to thermionic emission problems, and the third to the improvement of instrumentation.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<p>Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks.</p> <ol style="list-style-type: none">1. Ability to discuss Properties of Semiconductors: Electronic in solid , energy bands, and Conductivity.2. Ability to discuss Diffusion and drift, basic equation of semiconductor device operation and PN Junction .3. Ability to discuss Photonic Devices : Light absorption and emission in semiconductor , laser fundamentals, photo – detectors and Solar cell.4. Ability to discuss Switching, (CE), (CB)and (CC) configuration.5. Ability to discuss PIN detectors, thermal detectors, and spectral response.
Indicative Contents المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p>This course covers fundamentals of Properties of Semiconductors: Electronic in solid , energy bands, and Conductivity, mobility, life time recombination. [15 hrs]</p> <p>Diffusion and drift, basic equation of semiconductor device operation and PN Junction: Depletion region capacitance. [10 hrs]</p> <p>Also discuss Photonic Devices : Light absorption and emission in semiconductor , laser fundamentals, photo– detectors and Solar cell. [15 hrs]</p> <p>PIN detectors, thermal detectors, and spectral response and Switching, (CE), (CB)and (CC) configuration . [15 hrs]</p> <p>Revision problem classes [6 hrs]</p>

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
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	refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.
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Student Workload (SWL) الحمل الدراسي للطلاب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	52	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	73	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	5.2
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	20% (20)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.				
	Report	1	10% (10)	13	LO #5, #8 and #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	Introduction - Charge carries in semiconductors, Transport mechanism
Week 2	Diffusion and drift, basic equation of semiconductor device operation
Week 3	-PN Junction: Depletion region capacitance -Current component in PN junction I-V characteristics

Week 4	Effect of temperature.. forward and reverse biasing
Week 5	Switching time, diode equivalent circuit, real diode
Week 6	Ideal diode , load diode
Week 7	Application of PN Junction : Rectification . half wave, full wave
Week 8	Clipping, zener diode, voltage regulation, tunnel, reactor
Week 9	-LED, photodiode, laser diode -Photovoltaic effect. The photoconductive effect
Week 10	Photonic Devices : Light absorption and emission in semiconductor
Week 11	-laser fundamentals, photo – detectors -Solar cell, PIN detectors, thermal detectors, and spectral response
Week 12	-Bipolar Junction Transistors: Construction -Current conduction mechanism, leakage currents -Static characteristic
Week 13	-Switching, (CE), (CB)and (CC) configuration -Biasing, D.C load line
Week 14	-FET and MOSFET: Construction, theory of operation -Static characteristics, transfer characteristics
Week 15	Biasing, D.C load line
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	Physics Electronic: Physics Electronic	Yes
Recommended Texts		
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.