



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



الملحق 4: وصف المادة الدراسية

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Electronic II		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	COE 209		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	UGII	Semester of Delivery	
Administering Department	BSc - COMM	College	College of Engineering
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	2024/9/1	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	COE 204 : Electronic I	Semester	1
Co-requisites module	None	Semester	



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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. The student learns about the basic construction and operation of a multistage amplifiers. 2. Identify and be able to explain the characteristics and types of multistage amplifiers (cascade....etc.). 3. Being able to identify Tuned amplifiers. 4. The student will then be able to learn about Transformer- coupled amplifiers for a variety of configurations. 5. Understand the Description and operation of four-layer devices. 6. The student will also be familiar with the Oscillators kinds and applications. 7. Learn about the Large-Signal Amplifier classifications and applications. 8. Understand the basic operation of Integrated Circuit power amplifier. 9. Begin to understand the electronic communication principals, types, modulation and multiplexing.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Enabling student to know the concepts of multistage amplifiers. 2. Enabling student to know about the types of multistage amplifiers. 3. Enabling student to understand the design concepts of Large-Signal Amplifier. 4. Understand the basic operation of OP-AMP amplifiers. 5. Enabling student to understand the fundamentals of electronic communication and Communication Systems.
Indicative Contents المحتويات الإرشادية	<p>Indicative content includes the following.</p> <ul style="list-style-type: none"> • Course introduction (4 hrs) • Working with Power point (8 hrs) • Theoretical lectures (32 hrs) • Lap (16 hrs)
Description	<p>Multistage amplifier: Analysis of multistage amplifiers (voltage gain, current gain, etc.), and types of multistage amplifiers (cascade....etc.).</p> <p>Tuned amplifiers: Transformer- coupled amplifiers; signal- tuned, and tapped and double tuned amplifiers.</p> <p>Introduction to four-layer devices: Description and operation of silicon control rectifier, disc, thirstier, GTO, and triac. Feedback Amplifier, Op-Amp and Application.</p>



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	<p>Oscillators: Positive feedback and oscillation, Stability of Oscillation, Sinusoidal oscillator, Phase-shift Oscillator, Wien Bridge Oscillator, LC-Oscillator, Crystal Oscillator.</p> <p>Large-Signal Amplifier: Amplifier classification, Class A, Class B, Class AB, Class C, Power field-effect Transistor, Integrated Circuit power amplifier, Push-pull. OP-AMP amplifiers, Integration using OP-AMP, differentiation using OP-AMP. Oscillators using OP-AMP, 555 timer and applications. voltage control oscillator using 555 timer.</p> <p>Introduction to electronic communication: Communication Systems, Types of Electronic Communication, modulation and multiplexing, the electromagnetic spectrum, Bandwidth. Concept of gain and attenuation, Reactive components, Tuned circuits and Resonance, filters circuits, Fourier theory.</p>
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>In this course, students are guided by:</p> <ul style="list-style-type: none"> • Using different examples. • Using different styles of discussion that aim to connect the theoretical and practical sides. • Asking questions and giving exercises that require analysis and conclusions related to lectures. • Encourage students to participate in discussions and do the practical work. • Encourage students to work in groups.
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	32	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	2.1
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		



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Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	6 and 12	LO #1 to #3 and #4 , #5
	Assignments	2	10% (10)	2 and 13	LO #3 to #5
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #3, #4 and #5
Summative assessment	Midterm Exam	1hr	10% (10)	9	LO #1 - #5
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview and history of Electronics types and Applications.
Week 2	Multistage amplifier: Analysis of multistage amplifiers (voltage gain, current gain, etc.)
Week 3	Types of multistage amplifiers (cascade....etc.)
Week 4	Tuned amplifiers: Transformer- coupled amplifiers; signal- tuned, and tapped and double tuned amplifier
Week 5	Introduction to four-layer devices: Description and operation of silicon control rectifier, disc, thyrister, GTO, and triac
Week 6	Feedback Amplifier, Op-Amp and Application
Week 7	Oscillators: Positive feedback and oscillation, Stability of Oscillation Sinusoidal oscillator
Week 8	Phase-shift Oscillator, Wien Bridge Oscillator, LC-Oscillator, Crystal Oscillator
Week 9	Large-Signal Amplifier: Amplifier classification, Class A, Class B, Class AB, Class C, Power field-effect Transistor
Week 10	Integrated Circuit power amplifier, Push-pull. OP-AMP amplifiers,





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	Integration using OP-AMP, differentiation using OP-AMP.
Week 11	Oscillators using OP-AMP, 555 timer and applications. voltage control oscillator using 555 timer.
Week 12	Introduction to electronic communication: Communication Systems, Types of Electronic Communication, Modulation and multiplexing, the electromagnetic spectrum, Bandwidth. Concept of gain and attenuation, Reactive components, Tuned circuits and Resonance, filters circuits, Fourier theory
Week 13	Amplitude Modulator and Demodulator Circuits: Basic principles of amplitude modulation, Amplitude Modulators, Amplitude Demodulators, Balanced Modulators, SSB Circuits. Angle modulation Circuits: Frequency Modulators, Phase Modulators, Frequency Demodulators.
Week 14	Digital Modulation Circuits: BPSK Modulator, Coherent Detector for BPSK, QPSK Transmitter and Coherent Receiver, Non coherent BASK Receiver. DPSK Transmitter and Receiver.
Week 15	PowerPoint: Prepare to deliver your presentation
Week 16	Preparatory week before the final exam

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to the lab and get started with use of tools which uses in the experiments.
Week 2	Introduction to the devices uses in the lab and and how to use it.
Week 3	An overview of the experiments that will be carried out in the laboratory and using some of the available programs.
Week 4	Oscillators: Implementation this experiment in the laboratory
Week 5	Amplifiers: Implementation this experiment in the laboratory
Week 6	OP-AMP applications: Implementation this experiment in the laboratory
Week 7	555-timer applications: Implementation this experiment in the laboratory
Week 8	Voltage control oscillator: Implementation this experiment in the laboratory
Week 9	Gain analysis: Implementation this experiment in the laboratory
Week 10	Linear and angle modulations' different types of modulation and demodulation circuits: Implementation this experiment in the laboratory
Week 11	Linear and angle modulations' different types of modulation and demodulation circuits: Implementation this experiment in the laboratory

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Week 12	Digital modulation and demodulation circuits: Implementation this experiment in the laboratory
Week 13	Digital modulation and demodulation circuits: Implementation this experiment in the laboratory
Week 14	Review and discussion
Week 15	Preparatory week before the final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	<ul style="list-style-type: none"> Electronic Devices and Circuit Theory Robert L. Boylestad Louis Nashelsky/ Eleventh Edition . Electron Flow Version Ninth Edition Thomas L. Floyd 	Yes
Recommended Texts	<ul style="list-style-type: none"> Fundamentals of Microelectronics Second Edition Behzad Razavi, University of California, Los Angeles 	No
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.				