	Ministry of Higher Education and Scientific Research - Iraq Al-Mansour University College Department of Communication Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Electronic I**			**Module Delivery**	
Module Type	**Core**				
Module Code	**COM 23104**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	UGII		**Semester of Delivery**	1	
Administering Department	BSc – COMM		**College**	Al-Mansour University College	
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	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. The student learns about the basic construction and operation of a bipolar transistor. And be able to apply appropriate biasing to secure operation in the active area. 2. Identify and be able to explain the characteristics of an NPN or PNP transistor, and the student learns about the important parameters that determine the response of the transistor. 3. Being able to test the transistor and identify its three terminals. 4. The student will then be able to determine DC current levels for a variety of important BJT configurations. 5. Understand how to measure the important voltage levels of a BJT transistor configuration and use them to determine if the network is working properly. 6. The student will also be familiar with the saturation and cut-off conditions of the BJT network and the expected voltage and current levels determined by each condition. 7. Be able to perform load line analysis for the most common BJT configurations. 8. Learn about the design process of BJT loudspeakers. 9. Understand the basic operation of transistor switching networks. 10. Begin to understand the troubleshooting process as applied to BJT configurations. 11. Develop a sense of the stability factors of BJT formation and how they affect its operation as a result of changes in specific properties and environmental changes.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Enabling student to know the concepts of bipolar transistor, NPN or PNP transistor by learning the basics of the transistor. 2. Enabling student to know about the BJT transistor configurations. 3. Enabling student to design process of BJT loudspeakers. 4. Understand the basic operation of transistor switching networks 5. Enabling student to test the transistor and identify its three terminals.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** • Course introduction (4 hrs) • Working with Power point (8 hrs) • Theoretical lectures (32 hrs) • Lab. (16 hrs)
Description	**Transistor** Concept, Transistor construction, Transistor operation, common-

	base configuration, common-emitter configuration, and common-collector configuration. **Bipolar Junction Transistors:** Introduction, Transistor Construction, Transistor Operation, Common-Base Configuration, Common-Emitter Configuration, Common-Collector Configuration, Limits of Operation. **DC Biasing—BJTs:** Introduction, Operating Point, Fixed-Bias Configuration, Emitter-Bias Configuration, Voltage-Divider Bias Configuration, Collector Feedback Configuration, Emitter-Follower Configuration, Common-Base Configuration, Miscellaneous Bias Configurations, Design Operations, Multiple BJT Networks, Transistor Switching Networks, Troubleshooting Techniques, Bias Stabilization. **BJT AC Analysis:** Amplification in the AC Domain, BJT Transistor Modeling, The r_e Transistor Model, Common-Emitter Fixed-Bias Configuration, Voltage-Divider Bias, CE Emitter-Bias Configuration, Emitter-Follower Configuration, Common-Base Configuration, Collector Feedback Configuration, Collector DC Feedback Configuration, Two-Port Systems Approach, The Hybrid Equivalent Model, Approximate Hybrid Equivalent Circuit, Complete Hybrid Equivalent Model. **Field-Effect Transistors,** Introduction, Construction and Characteristics of JFETs, Transfer Characteristics.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	In this course, students are guided by: • 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.

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	**6.2**
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	**57**	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	**3.8**
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
	Quizzes	**2**	**5% (10)**	**6 and 12**	**LO #1 to #3 and #4 to #6**
	Assignments	**2**	**5% (10)**	**2 and 13**	**LO #3 to #6**
	Projects / Lab.	**1**	**10% (10)**	**Continuous**	**All**
	Report	**5**	**2% (10)**	**13**	**LO #3, #4 and #6**
	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 semiconductor Diodes and Diode Applications.
Week 2	**Transistor Concept**, Transistor construction, Transistor operation, common-base configuration, common-emitter configuration, and common-collector configuration.
Week 3	**Bipolar Junction Transistors:** Introduction, Transistor Construction, Transistor Operation, Common-Base Configuration, Common-Emitter Configuration, Common-Collector Configuration, Limits of Operation.
Week 4	**DC Biasing—BJTs:** Introduction, Operating Point, Fixed-Bias Configuration,
Week 5	**DC Biasing—BJTs:** Emitter-Bias Configuration, Voltage-Divider Bias Configuration, Collector Feedback Configuration, Emitter-Follower Configuration,
Week 6	**DC Biasing—BJTs:** Common-Base Configuration, Miscellaneous Bias Configurations, Design Operations, Multiple BJT Networks,
Week 7	**DC Biasing—BJTs:** Transistor Switching Networks, Troubleshooting Techniques, Bias Stabilization.
Week 8	**BJT AC Analysis:** Amplification in the AC Domain, BJT Transistor Modeling,
Week 9	**The r_e** Transistor Model, Common-Emitter Fixed-Bias Configuration, Voltage-Divider Bias, CE Emitter-Bias Configuration,
Week 10	Emitter-Follower Configuration, Common-Base Configuration, Collector Feedback Configuration, Collector DC Feedback Configuration,
Week 11	Two-Port Systems Approach, The Hybrid Equivalent Model,
Week 12	Approximate Hybrid Equivalent Circuit, Complete Hybrid Equivalent Model.
Week 13	**Field-Effect Transistors,** Introduction, Construction.
Week 14	Characteristics of **JFETs**, Transfer Characteristics.
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	Diode Characteristics: Implementation this experiment in the laboratory.
Week 5	Clipping and Clamping: Implementation these experiments in the laboratory.
Week 6	Rectifiers: Implementation this experiment in the laboratory
Week 7	Transistor Characteristics: Implementation this experiment in the laboratory.
Week 8	Transistor Characteristics: Implementation this experiment in the laboratory
Week 9	Transistor CE Characteristics: Implementation this experiment in the laboratory
Week 10	Transistor CE Characteristics: Implementation this experiment in the laboratory
Week 11	Transistor CB Characteristics: Implementation this experiment in the laboratory
Week 12	Transistor CB Characteristics: Implementation this experiment in the laboratory
Week 13	Transistor CC Characteristics: 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	• Electronic Devices and Circuit Theory Robert L. Boylestad Louis Nashelsky/ Eleventh Edition . • Electron Flow Version Ninth Edition, Thomas L. Floyd	Yes
Recommended Texts	• Fundamentals of Microelectronics Second Edition Behzad Razavi, University of California, Los Angeles	No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
	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
	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.