MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information
معلومات المادة الدراسية

Module Title	**Analogue Electronics**	**Module Delivery**	
Module Type	Core	☒Theory	
Module Code	**CPE 203**	☒Lecture ☐ Lab	
ECTS Credits	**6**	☐ Tutorial ☐Practical	
SWL (hr/sem)	**150**	☐Seminar	
Module Level	2	**Semester of Delivery**	3
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	02/06/2024	**Version Number**	1.0

Relation with other Modules
العلاقة مع المواد الدراسية الأخرى

Prerequisite module	CPE 108	**Semester**	2
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 understand the construction and operation of Bipolar Junction Transistor (BJT). 2. To understand and analyze the Biasing circuits of BJT. 3. The student learns the biasing circuits, the components and the operation of the MOSFET. 4. The student learns how to analyze Amplifier circuits of MOSFET transistors 5. The student learns the principles of operational amplifier applications.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understand the construction and operation of BJT. 2. Learn and analyze the Biasing circuits of BJT. 3. Learn the types, construction and operation of the FET 4. Understand the operation of Enhancement MOSFET. 5. Understand the Characteristics of Enhancement MOSFET. 6. Learn the Biasing of Enhancement MOSFET. 7. Understand the MOSFET as an Amplification circuit 8. Learn the Small-Signal Equivalent Circuit Models. 9. Understand and analyze the Common source amplifier circuit 10. Understand and analyze the Common gate and common drain amplifier circuits 11. Learn the principles of Operational amplifier (OP-Amp) 12. Understand the application circuits of OP-Amp.
Indicative Contents المحتويات الإرشادية	**Indicative content includes the following.** • Introduction: Overview about P.N Junction; (3 hrs) • Bipolar Junction Transistors (BJT): Construction, Operation and biasing (9 hrs) • Overview about Field Effect Transistors types (3 hrs) • MOSFET: types, operation and construction (3 hrs) • Operation, Characteristics and Biasing of Enhancement MOSFET (9 hrs) • Amplifier circuits of Enhancement MOSFET (3 hrs) • Small-Signal Equivalent Circuit Models Enhancement MOSFET amplifier (9 hrs) • Application Circuits of the Operational Amplifiers (OP Amp) (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.

<table>
<tr><td colspan="4" align="center">**Student Workload (SWL)**
الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا</td></tr>
<tr>
<td>**Structured SWL (h/sem)**
الحمل الدراسي المنتظم للطالب خلال الفصل</td>
<td>**48**</td>
<td>**Structured SWL (h/w)**
الحمل الدراسي المنتظم للطالب أسبوعيا</td>
<td>**3.2**</td>
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<td>**Unstructured SWL (h/sem)**
الحمل الدراسي غير المنتظم للطالب خلال الفصل</td>
<td>**102**</td>
<td>**Unstructured SWL (h/w)**
الحمل الدراسي غير المنتظم للطالب أسبوعيا</td>
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<td>**Total SWL (h/sem)**
الحمل الدراسي الكلي للطالب خلال الفصل</td>
<td colspan="3" align="center">**150**</td>
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<tr><td colspan="6" align="center">**Module Evaluation**
تقييم المادة الدراسية</td></tr>
<tr>
<th></th>
<th></th>
<th>Time/Number</th>
<th>Weight (Marks)</th>
<th>Week Due</th>
<th>Relevant Learning Outcome</th>
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<tr>
<td rowspan="4">**Formative assessment**</td>
<td>**Quizzes**</td>
<td>2</td>
<td>20% (10)</td>
<td>6 and 12</td>
<td>LO #1 to #4 and #6 to #8</td>
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<tr>
<td>**Assignments**</td>
<td>2</td>
<td>10% (5)</td>
<td>4, 7 and 10</td>
<td>LO #2, #3, #4, #5 and #7,#8,#9</td>
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<tr>
<td>**Class work**</td>
<td>2</td>
<td>10% (5)</td>
<td></td>
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<td>**Report**</td>
<td></td>
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<tr>
<td rowspan="2">**Summative assessment**</td>
<td>**Midterm Exam**</td>
<td>1 hr</td>
<td>10% (10)</td>
<td>9</td>
<td>LO #1 - #7</td>
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<tr>
<td>**Final Exam**</td>
<td>3 hr</td>
<td>50% (50)</td>
<td>16</td>
<td>All</td>
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<tr>
<td colspan="2">**Total assessment**</td>
<td></td>
<td>100% (100 Marks)</td>
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Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week 1	Overview about P-N Junction
Week 2	Bipolar Junction Transistors (BJT): Construction and Operation
Week 3	Biasing Circuits and DC Load line of BJT
Week 4	Biasing Circuits and DC Load line of BJT
Week 5	Overview about Field Effect Transistors
Week 6	MOSFET: types, operation and construction
Week 7	Enhancement MOSFET: characteristics and regions of operation
Week 8	Characteristics of Enhancement MOSFET
Week 9	Biasing of Enhancement MOSFET
Week 10	MOSFET as an Amplifier and Small-Signal Equivalent Circuit Models
Week 11	Current Mirror
Week 12	Common Source Amplifier.
Week 13	Common Gate Amplifier.
Week 14	Common Drain (Source Follower) Amplifier.
Week 15	Application Circuits of the Operational Amplifiers (OP Amp)
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	• Sedra and Smith, *Microelectronic Circuits*, Oxford University Press, *Sixth Edition*, 2010	Yes
Recommended Texts	• Neamen, Microelectronics - Circuit Analysis and Design, McGraw-Hill, 2010. • Behzad Razavi, Fundamentals of Microelectronics, John Wiley & Sons, Preview Edition, 2006 • Jimmie J. Cathey, Ph.D, Theory and Problems of Electronic Devices and Circuits, 2nd Edition, 2002. • Robert L. Boylestad and Louis Nashelsky, Electronic Devices and Circuit Theory, 7th or 10th or 11th Edition. • Any other materials available on the web.	No
Websites	https://youtube.com/playlist?list=PLo6jdcSSoHsLQGLzFrU6tg3e12lS_GDSZ&feature=shared	

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.