

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Wireless Networking		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code			
ECTS Credits	8		
SWL (hr/sem)	Its hours		
Module Level		Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Name	e-mail	E-mail
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	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Computer Networks	Semester	
Co-requisites module	Internet Architecture	Semester	

Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<p>Module Objectives أهداف المادة الدراسية</p>	<ol style="list-style-type: none">1. To develop problem solving skills and understanding of circuit theory through the application of techniques.2. To understand voltage, current and power from a given circuit.3. This course deals with the basic concept of electrical circuits.4. This is the basic subject for all electrical and electronic circuits.5. To understand Kirchhoff's current and voltage Laws problems.6. To perform mesh and Nodal analysis.
<p>Module Learning Outcomes مخرجات التعلم للمادة الدراسية</p>	<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. Recognize how electricity works in electrical circuits.2. List the various terms associated with electrical circuits.3. Summarize what is meant by a basic electric circuit.4. Discuss the reaction and involvement of atoms in electric circuits.5. Describe electrical power, charge, and current.6. Define Ohm's law.7. Identify the basic circuit elements and their applications.8. Discuss the operations of sinusoid and phasors in an electric circuit.9. Discuss the various properties of resistors, capacitors, and inductors.10. Explain the two Kirchoff's laws used in circuit analysis.11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
<p>Indicative Contents المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A - Circuit Theory</u></p> <p>DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchoff's laws and Ohm's law. Anatomy of a circuit, Network reduction, Introduction to mesh and nodal analysis. [15 hrs]</p> <p>AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs]</p> <p>AC Circuits II - Phasor diagrams, definition of complex impedance, AC circuit analysis with complex numbers. [10 hrs]</p> <p>RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs]</p>

	<p>Revision problem classes [6 hrs]</p> <p><u>Part B - Analogue Electronics</u></p> <p>Fundamentals Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, current and voltage division, input resistance, output resistance, coupling and decoupling capacitors, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs]</p> <p>Components and active devices – Components vs elements and circuit modeling, real and ideal elements. Introduction to sensors and actuators, self-generating vs modulating type sensors, simple circuit interfacing. [7 hrs]</p> <p>Diodes and Diode circuits – Diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, rectification and peak detection, photodiodes, LEDs, Zener diodes, voltage stabilization, voltage reference, power supplies. [15 hrs]</p>
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Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	<p>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 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.</p>
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Student Workload (SWL)

الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	109	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	91	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	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: History of WN, WN Usage, Architecture of the WN
Week 2	Wireless Personal Area Network (WPAN) or Piconets: Bluetooth and IR Technology
Week 3	Wireless Local Area Networks (WLAN): WiFi Technology
Week 4	WiFi Technology – cont.
Week 5	Wireless Metropolitan Area Networks (WMAN): WiMax Technology
Week 6	Wireless Wide Area Networks (WWAN): Cellular (or Mobile) Networks; From 1G to 2G.
Week 7	Cellular (or Mobile) Networks; From 3G to LTE.
Week 8	Cellular (or Mobile) Networks; From 4G to 5G.
Week 9	Mobile IP
Week 10	Introduction to Vehicular Wireless Networks
Week 11	Introduction to Internet of Things

Week 12	Introduction to MANET Networks
Week 13	Midterm Exam
Week 14	Comprehensive Review
Week 15	Comprehensive Review
Week 16	Preparatory week before the final Exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Net Simulators
Week 2	Lab 2: Install OPNET Simulator
Week 3	Lab 3: Simulating of Basic Net
Week 4	Lab 4: Performance of Simple Net
Week 5	Lab 5: Fixed Wifi Net
Week 6	Lab 6: Mobility of Wifi Nodes
Week 7	Lab 7: MAC of Wifi

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	Beard, Cory and William Stallings. Wireless communication networks and systems. 2016.	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded

(0 – 49)	F – Fail	راسب	(0-44)	Considerable amount of work required
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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.