

ELEC C1611: Electrical and Electronic Fundamentals

Module Title:			Electrical and Electronic Fundamentals		
Language of Instruction:		ו:	English		
Credits:		10			
		8			
NI & Level.		0			
Module Delivered In			5 programme(s)		
Teaching & Learning Strategies:			A combination of lectures, tutorials, class-based tasks and laboratory exercises will be used. Particular emphasis will be placed on active learning including problem/project-based learning. The practical sessions will be used to back up the theory. The Institute VLE will be used to interactively communicate with students		
Module Aim:			To give the students an understanding of the concept of an electric circuit and its associated parameters. To develop their ability to apply circuit laws to simplify basic electric circuits. To introduce students to the field of electronics and understand the properties of electronic devices.		
Learning Ou	itcomes				
On successfu	ul completion	n of th	nis module the learner should be able to:		
LO1	Demonstra	ite an	understanding of electric circuits.		
LO2	Describe th	ne cha	aracteristics of basic electronic components and the functional operation of common electronic systems.		
LO3	Describe the characteristics of common electronic digital and analogue signals.		aracteristics of common electronic digital and analogue signals.		
LO4	Perform calculations to permit the analysis of basic electrical (DC) and electronic circuits.		tions to permit the analysis of basic electrical (DC) and electronic circuits.		
LO5	Using sche	Jsing schematic diagrams, build and test electrical and electronic circuits in a laboratory environment.			
Pre-requisit	e learning				
Module Recommendations This is prior learning (or a practical skill) that is recommended before enrolment in this module.					
No recommendations listed					
Incompatible Modules These are modules which have learning outcomes that are too similar to the learning outcomes of this module.					
No incompatible modules listed					
Co-requisite Modules					
No Co-requisite modules listed					
Requirements This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.					
No requirements listed					



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Module Content & Assessment

Indicative Content							
Quantities and Units Units of Measurement and Metric Prefixes.							
Voltage, Current and The Electric Circuit. Ba	Voltage, Current and Resistance The Electric Circuit. Basic Circuit Measurements.						
Ohm's Law The Relationship of Cu	urren	t, Voltage, and Resistance.					
Energy and Power Power in an Electric C	ircuit	. Resistor Power Ratings.					
Series Circuits Resistors in Series. Kirchhoff's Voltage Law. Troubleshooting.							
Parallel Circuits Resistors in Parallel. K	Parallel Circuits Resistors in Parallel. Kirchhoff's Current Law. Parallel Circuit Applications.						
Series-Parallel Circuits Analysis of Series-Parallel Resistive Circuits. Ladder Networks.							
Block Diagrams System design using block diagrams.							
Signals Generation and Characteristics of signals.							
Semiconductors Basic semiconductor devices e.g. diodes, zener diodes							
AC to DC Conversion Designing a AC to DC	n conv	verter using rectifiers, transformers, filters and regulators.					
Number systems Binary and Hexadecim	nal N	umber Systems					
Logic Gates Digital Schematic desi	gn u	sing logic gates					
Timing Diagrams Timing diagrams for co	ombi	national and sequential digital circuits.					
Flip Flops D, JK, SR flip flop and	latch	nes					
Assessment Breakdo	own			%			
Continuous Assessme	Continuous Assessment 40 00%						
Practical	-			30.	0.00%		
End of Module Formal Examination 30.00%							
	_						
Continuous Assessn	nent						
Assessment Type		Assessment Description	Outcome addressed		% of total	Assessment Date	
Other		Several in-class and/or online assessments.	1,2,3,4		40.00	n/a	
No Project							
Practical							
Assessment Type	Assessment Description Outcome addressed		Outcome addressed	ed		Assessment Date	
Practical/Skills Evaluation	The and	e student will complete practical assignments during the module d write a report on each assignment.	ule 1,4,5 20.00		Every Week		
Practical/Skills Evaluation	Lea	arners will complete practical tasks for summative assessment.	1,4,5		10.00	End-of- Semester	
End of Module Forma	al Ex	amination					

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date	
Formal Exam	The written examination, at the end of the module, will evaluate the extent of the student's knowledge of the learning outcomes	1,2,3,4	30.00	End-of- Semester	

SETU Carlow Campus reserves the right to alter the nature and timings of assessment



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Module Workload

Workload: Full Time				
Workload Type	Frequency	Average Weekly Learner Workload		
Lecture	Every Week	4.00		
Lecture	Every Week	2.00		
Practicals	Every Week	4.00		
Independent Learning	Every Week	6.00		
	Total Hours	16.00		

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EEBEE_B	Bachelor of Engineering (Honours) in Biomedical Electronics	1	Mandatory
CW_EESYS_B	Bachelor of Engineering (Honours) in Electronic Engineering	1	Mandatory
CW_EEROB_B	Bachelor of Engineering (Honours) in Robotics and Automated Systems	1	Mandatory
CW_EEBEE_D	Bachelor of Engineering in Biomedical Electronics	1	Mandatory
CW_EEROO_D	Bachelor of Engineering in Robotics and Automated Systems	1	Mandatory