ELEC H3603: Electrical Power Systems

Module Title:	Electrical Power Systems
Language of Instruction:	English

Credits:	5

NFQ Level:	7

Module Delivered In	1 programme(s)

Teaching & Learning Strategies:	Teaching will be conducted through lectures, practicals and problem-based learning. The practical sessions will be used to reinforce the concepts learned throughout the course

Module Aim:	To provide students with knowledge and understanding of aircraft electric power generation, distribution, protection, regulation and utilization.

Learning Outcomes	
On successful completion of this module the learner should be able to:	
LO1	Describe the fundamental principles of power generation, distribution, protection and utilization on board aircraft.
LO2	Explain the design, construction and operation of components and subsystems that comprise aircraft electrical power systems.
LO3	Analyse electrical and electronic circuits and calculate parameters associated with their operation and performance.
LO4	Evaluate electrical and electronic systems for aircraft using computer based engineering tools
LO5	Design, assemble, test and debug electrical and electronic circuits associated with aircraft electrical power systems.

Pre-requisite 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
Batteries Types of batteries, voltage and current ratings, construction, installation, operation, capacity and discharge rates, series, parallel connections.
DC Power Generation Generator principles, commutation, armature reaction and losses, practical DC generators, generator classification, series, shunt, compound wound.
AC Power Generation Single-phase alternator, three-phase alternator, alternator construction, alternator ratings, compound generator, emergency power generation, auxiliary power unit.
Power Distribution and Utilization Busbars, load categorization, load sharing, paralleling generators, circuit protection.
Power Conversion and Regulation Inverters, transformers, rectifiers, AC & DC voltage regulation, current regulation, frequency regulation.
More Electric Aircraft No bleed systems, hybrid, electric, fuel cell technology, DC & AC motors, synchronous and induction motors.

Assessment Breakdown	%
Continuous Assessment	10.00%
Practical	40.00%
End of Module Formal Examination	50.00%

Continuous Assessment

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Examination	Students will be assessed periodically to gauge their understanding and knowledge of the material.	1,2,3	10.00	n/a

No Project

Practical

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Practical/Skills Evaluation	Students will complete a number of practical tasks and CAD assignments during the module. Students will write a report or produce a portfolio of their work. Students may also complete a practical and/or a CAD test during the module.	3,4,5	40.00	Every Second Week

End of Module Formal Examination

Assessment Type	*Assessment Description*	*Outcome addressed*	*% of total*	*Assessment Date*
Formal Exam	Final Written Exam	1,2,3	50.00	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	12 Weeks per Stage	2.00
Practicals	12 Weeks per Stage	3.00
Independent Learning	15 Weeks per Stage	4.33
	Total Hours	125.00

Module Delivered In

Programme Code	Programme	Semester	Delivery
CW_EEACS_D	Bachelor of Engineering in Aircraft Systems	5	Mandatory