Electrical Machines

Module Information

2022.01, Approved

Summary Information

Module Code	4511NCCG
Formal Module Title	Electrical Machines
Owning School	Engineering
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 4
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

Partner Teaching Institution

Institution Name
Nelson and Colne College Group

Learning Methods

Learning Method Type	Hours
Lecture	36
Practical	24

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
APR-PAR	PAR	April	12 Weeks
JAN-PAR	PAR	January	12 Weeks

SEP-PAR	PAR	September	12 Weeks
SEP_NS-PAR	PAR	September (Non-standard start date)	12 Weeks

Aims and Outcomes

Aims	This module introduces students to the characteristics and operational parameters of a range of electromagnetic powered machines that are used in a variety of applications. Among the topics included in this module are: principles underlying the operation and construction of transformers, induction motors, synchronous machines, electromagnetic transducers, actuators, and generators; and operating characteristics of electrical machines such as voltage, current, speed of operation, power rating, electromagnetic interference (EMI) and efficiency.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Assess the features and applications of single and 3-phase transformers.
MLO2	2	Analyse the characteristics, performance and applications of three-phase induction motors
MLO3	3	Investigate the performance of synchronous machines
MLO4	4	Analyse the operating characteristics of electromagnetic transducers and actuators.

Module Content

Outline Syllabus	Transformers: construction, application, characteristics, short circuit and no-load testing, equivalent circuit, star and delta configurations, calculations of torque, power and efficiency.Induction motors: star and delta wirings, short circuit and no-load testing, equivalent circuit, calculations of torque, power and efficiency, construction of practical motors, starting, use as generator.Synchronous machines: methods of excitation, equivalent circuit, calculations of torque power and efficiency, use as motors and generators.(A selection of) electromagnetic transducers and actuators: types, construction, applications, performance
Module Overview	
Additional Information	

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Presentation	Assignment	100	0	MLO3, MLO4
Competency	NCC Group Pass/Fail			MLO2

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Christian Matthews	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings