IMPERIAL

Module Specification

Basic details

UID		Cohorts covered	Earliest cohort	Latest c
Long title	Laboratory in FPN			
New code	ELEC70088	New short title		

Brief description of module *(approx. 600 chars.)*

The laboratory component provides practical experience into the operation of a microgrid in autonomous or islanded mode. You will learn how various generation sources or energy storage units coordinate to share the share the burden of supplying the demand and regulating the voltage. Different case studies will be alternated over time, the activity may involve a live demonstration on a bench-scale microgrid prototype at the Maurice Hancock Smart Energy Laboratory or a simulation-based study. The experimental or simulated results will be validated by mathematical analysis accounting for any discrepancies observed.

620 characters

Available as a standalone module/ short course? N

Statutory details

	ECTS	CATS	Non-credit	HECOS codes
Credit value	10	20	N	
FHEQ level	Level 7			

Allocation of study hours

	Hours	
Lectures		
Group teaching	2	*Incl. seminars, tutorials, problem classes.*
Lab/ practical	2	*Inc. professional and research skills training*
Other scheduled		*Incl. project supervision, fieldwork, external visits.*
Independent study	246	*Incl. wider reading/ practice, follow-up work, completion of assessments*
Placement		*Incl. work-based learning and study that occurs overseas.*
Total hours	250	
ECTS ratio	25.00	

Project/placement activity

Is placement activity allowed? No

Module delivery

Delivery mode	Taught/ Campus	Other	
Delivery term	Term 2	Other	

Ownership

Primary department	Electrical and Electronic Engineering
Additional teaching departments	

Delivery campus	South Kensington

Collaborative delivery

Collaborative delivery?	N
External institution	
External department	
External campus	

Associated staff

Role	CID	Given name	Surname
Module Leader		Yunjie	Gu

Learning and teaching

Module description

Learning outcomes	By the end of this module you will be able to: - analyse the steady-state operation of autonomous (or islanded) microgrids - assess how the operation is affected by various parameters - show examples of control mechanisms that enable microgrids to withstand disturbances (eg disconnection of units, etc) - evaluate any discrepancy between the experimental or simulation findings and mathematical analysis
Module content	The module consists of the following: - steady-state analysis of an autonomous microgrid - experimental demonstration on a bench-scale microgrid prototype or detailed simulation of a microgrid - sensitivity analysis against the system parameters - validation of the experimental or simulation results against mathematical analysis - quantifying and reporting on observed discrepancies between results
Learning and Teaching Approach	You will be given a description of the study case at the beginning of the Spring term. For those study cases that involve a demonstration at the Maurice Hancock Smart Energy Lab, you will be asked to pick a suitable time slot to visit the lab in small groups (a 1-2 hour session typically held in March). A set of tasks to be completed before and after the demonstration will be given along with the description of the study case. The work is carried out in groups (for more than 50% of the activities).
Assessment Strategy	The module is assessed through an individual preliminary report and a final report that are due to be submitted in June. The module must be passed in order to graduate. However, this module carries no weight towards your degree classification. A self-reflection on the performance of the team and of the individual as part of the team will also be assessed in a written report. You will need to desribe team organisation, your role within the team, effectiveness of own contribution and reflection on team working skills acquired.
Feedback	Formative feedback will be given in-situ during a live discussion during the demonstrations in the Maurice Hancock Smart Energy Lab or a drop-in session for the study cases based on simulation. Written feedback in the form of in-line annotations and a feedback summary will be provided for the submitted reports.
Reading list	Power system analysis and design' by Glover, Sarma, Overbye; Stamford, Conn.: Cengage

	Learning

Quality assurance

Date of first approval	
Date of last revision	December 2025
Date of this approval	December 2025
Module leader	Yunjie Gu
Notes/ comments	

Office use only

QA Lead	
Department staff	
Date of collection	
Date exported	
Date imported	

Template version #####

Assessment details

Grading method	Pass/Fail	Pass mark	100%

Assessments

Assessment type	Assessment description	Weighting	Pass mark	Must pass?
Coursework	Final Report	90%	50%	N
Coursework	Preliminary Report	10%	50%	N
Coursework	Self-reflection on individual performance as part of the team	0%	50%	Y
		100%	50%	Y