

Basic details

UID		Cohorts covered	Earliest cohort	Latest c
Long title	Sustainable Electrical Systems			
New code	ELEC70076	New short title		
Brief description of module (approx. 600 chars.)	This module reviews the motivating factors and aspirations for transforming the electricity system to a more sustainable form and provides an overview of the enabling technologies and system-level considerations. Knowledge of the basic operation of the low carbon energy technologies (such as wind, solar, hydro, heat networks etc.) and their impact on the system is provided. The planning, policy, operational and technology challenges posed by decarbonisation of the electric power sector are described in terms of the network integration of low carbon sources.			
563 characters				
Available as a standalone module/ short course?	N			

Statutory details

Credit value	ECTS 5	CATS 10	Non-credit N	HECOS codes
FHEQ level	Level 7			

Allocation of study hours

	Hours	
Lectures	20	
Group teaching		<i>Incl. seminars, tutorials, problem classes.</i>
Lab/ practical		
Other scheduled		<i>Incl. project supervision, fieldwork, external visits.</i>
Independent study	105	<i>Incl. wider reading/ practice, follow-up work, completion of assessments</i>
Placement		<i>Incl. work-based learning and study that occurs overseas.</i>
Total hours	125	
ECTS ratio	25.00	

Project/placement activity

Is placement activity allowed?	No
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Module delivery

Delivery mode	Taught/ Campus	Other	
Delivery term	Term 1	Other	

Ownership

Primary department	Electrical and Electronic Engineering
Additional teaching departments	N/A
Delivery campus	South Kensington

Collaborative delivery

Collaborative delivery? **N**

External institution	N/A
External department	N/A
External campus	N/A

Associated staff

Role	CID	Given name	Surname
Module Leader		Elina	Spyrou
Lecturer		Goran	Strbac

Learning and teaching

Module description

Learning outcomes	On successfully completing this module you should be able to: 1) appraise the changes and challenges foreseen in a low to zero-carbon electric power system 2) recognise the limitations of current network planning and operation with high fractions of renewables 3) understand the basic operation of various low carbon technologies 4) analyse key features such as intermittency or resource dependency 5) calculate the energy yields from low-carbon sources
Module content	1. Context, drivers and policy 2. Sustainable energy technologies - Weather-dependent sustainable energy technologies (wind, solar, hydro) - Storage technologies and low carbon thermal technologies - Towards a decarbonized electric power system: Technology and policy challenges - Heat networks 3. Network integration issues - Intermittency study: modelling of capacity credit, reserve and balancing - Technical Issues for Distributed Generation: modelling of voltage rise and power loss issues - Network Planning for Distributed Generation - Smart Grids
Learning support	
Learning and Teaching Approach	The module will be delivered primarily through lectures introducing the key concepts and methods. Learning will be reinforced through non-assessed problem sheets and two assessed courseworks.
Assessment Strategy	This module presents opportunities for both formative and summative assessment. You will be summatively assessed by a written examination at the end of the module. The exam is specifically formulated to assess the learning outcomes for the module. You will be formatively assessed through the coursework component of the module. You will have additional opportunities to self-assess your learning via non-assessed problem sheets.

Feedback	You will receive feedback on examinations in the form of published model answers annotated to highlight the common mistakes, and alternate approaches to the solutions reflecting the performance of the entire cohort. You will receive feedback on your the two courseworks normally within three weeks of the respective submission.
Reading list	The reading list is available via the Library's Leganto system.

Quality assurance

Date of first approval	
Date of last revision	March 2024
Date of this approval	January 2024

Module leader	Elina Spyrou
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Notes/ comments	
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Office use only

QA Lead	
Department staff	
Date of collection	

Date exported	
Date imported	

Assessment details

Grading method

Numeric

Pass mark

50%

Assessments

[illegible]

100%