

Basic details

UID		Cohorts covered	Earliest cohort Latest c
Long title	Microwave Technology		
New code	ELEC70054	New short title	
Brief description of module (approx. 600 chars.)	This module will present you with fundamental principles behind practical microwave technologies used in modern applications. 125 characters		
Available as a standalone module/ short course?	No		

Statutory details

	ECTS	CATS	Non-credit	HECOS codes
Credit value	5	10	N	
FHEQ level	L7			

Allocation of study hours

	Hours	
Lectures	20	
Group teaching	9	<i>Incl. seminars, tutorials, problem classes.</i>
Lab/ practical	2	
Other scheduled	0	<i>Incl. project supervision, fieldwork, external visits.</i>
Independent study	94	<i>Incl. wider reading/ practice, follow-up work, completion of assessments</i>
Placement	0	<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	Department of Electrical and Electronic Engineering
Additional teaching departments	0
Delivery campus	South Kensington

Collaborative delivery

Collaborative delivery? **No**

External institution
External department
External campus

Associated staff

Role	CID	Given name	Surname
Module leader		Stepan	Lucyszyn
		0	0
		0	0
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Learning and teaching

Module description

Learning outcomes	Upon successful completion of this module, you will be able to: 1. Interpret electromagnetic wave propagation in various media; how guided-wave structures can be used as practical components, bridging the gap between radio and optical frequencies. 2. Apply scattering(S)-parameters and their use in simulations and experiments. 3. Analyse the fundamental physical limitations of materials and components. For example, why some materials are better than others and why surface mounted devices are generally not used at upper microwave frequencies. 4. Present aspects of commercial technologies in the design and manufacture of components and circuits. 5. Theoretical predictions and a practical demonstration of the microwave oven will be given at the end of the course to highlight a number of basic electromagnetic principle associated with cavity resonators.
Module content	Electromagnetic Spectrum; Applications of Microwaves and RF; S-parameters; Microwave Office; Vector Network Analyzer. Material Characterization; Metamaterials; Lumped Elements; RLC Resonators; Transmission Lines; Antennas and Propagation; Guided-waves and Cavity Resonators; Thermionic Valve Technologies and Heating Applications.
Learning and Teaching Approach	The module is taught through lectures and exercise classes.
Assessment Strategy	This module is assessed by a 3-hour open book written exam. In addition there are two coursework assignments (CAD simulation and technical paper).
Feedback	You will receive written comments on exam example answers and feedback in exercise classes.
Reading list	Supplementary Reading:

[1] D. M. Pozar, Microwave engineering, 4th ed. Hoboken, N.J.: Wiley, 2012.

Background Reading:

[1] S. Lucyszyn, RFIC and MMIC design and technology. London :: London : Institution of Electrical Engineers, 2001.

[2] S. Lucyszyn, Advanced RF MEMS. Cambridge :: Cambridge : Cambridge University Press, 2010.

Required
equipment/ software

Quality assurance

Date of first approval February 2022
Date of last revision May 2023
Date of this approval

Module leader Prof. Stepan Lucyszyn

Notes/ comments

Office use only

QA Lead
Department staff
Date of collection

Date exported
Date imported

Template version #####

Assessment details

Grading method	Numerical
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Pass mark

50%

Assessments

[illegible]

100%