ES9ZZ-15 Microwave Engineering and RF Circuits

24/25

Department
School of Engineering
Level
Taught Postgraduate Level
Module leader
Christos Mias
Credit value
15
Module duration
10 weeks
Assessment
40% coursework, 60% exam
Study location
University of Warwick main campus, Coventry

Description

Introductory description

ES3E6-15 Microwave Engineering and RF Circuits

Module web page

Module aims

By the end of the module students should be able to:

- To present specialist microwave engineering and RF circuit theory, enable students to perform microwave measurements and design microwave components and RF circuits.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Review of transmission line theory, Smith Chart, impedance matching, EM waves

General theory of waveguides
Microstrip line
Scattering parameters
Microwave resonators, power dividers and filters
RF Amplifier Design

Learning outcomes

By the end of the module, students should be able to:

- Consolidate specialised knowledge in RF circuit design. [M1,M2]
- Experimentally evaluate the performance of microwave components using microwave equipment. [M12]
- Design RF circuits. [M3,M4,M13]
- Perform complex analytical calculations in microwave engineering. [M1,M2,M6]
- Design Microwave devices [M4]
- Consolidate specialised knowledge in microwave engineering [M1,M2]

Indicative reading list

1. Microwave and Millimeter-Wave Design for Wireless Communications, N. Somjit, I. Robertson, M. Chongcheawchamnan, 2016, John Wiley and Sons.
2. Microwave Active Circuit Analysis and Design, Clive Poole and Izzat Darwazeh, 2016, Academic Press.
3. Passive and Active RF-Microwave Circuits, Pierre Jarry and Jacques N. Beneat, ISTE Press, Elsevier, 2015.
4. Microwave Engineering, David M. Pozar, Wiley, 2012.

Subject specific skills

Ability to apply relevant practical and laboratory skills
Ability to conceive, make and realise a component, product, system or process
Ability to be pragmatic, taking a systematic approach and the logical and practical steps necessary for, often complex, concepts to become reality

Transferable skills

Numeracy: apply mathematical and computational methods to communicate parameters, model and optimize solutions
Apply problem solving skills, information retrieval, and the effective use of general IT facilities
Plan self-learning and improve performance, as the foundation for lifelong learning/CPD
Exercise initiative and personal responsibility, including time management, which may be as a team member or leader

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Study

Study time

Type	Required
Lectures	30 sessions of 1 hour (20%)
Practical classes	1 session of 2 hours (1%)
Other activity	2 hours (1%)
Private study	116 hours (77%)
Total	150 hours

Private study description

Self-study 116 hours

Other activity description

2x1 hour Revision classes

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group D

	Weighting	Study time	Eligible for self-certification
Assessment component			
Assignment Assignment (2000 words)	40%		Yes (extension)
Reassessment component is the same			
Assessment component			
Online Examination	60%		No

	Weighting	Study time	Eligible for self-certification
QMP online examination ~Platforms - AEP,QMP			

- Online examination: No Answerbook required
- Students may use a calculator

Reassessment component is the same

Feedback on assessment

- Support through advice and feedback hours.
- Written feedback on marked assignment reports.
- Cohort-level feedback on final exam.

Past exam papers for ES9ZZ

Availability

Courses

This module is Optional for:

- Year 1 of TESA-H641 Postgraduate Taught Communications and Information Engineering

This module is Option list A for:

- Year 1 of TESA-H644 Postgraduate Taught Electrical and Electronic Engineering