Module Specification

Advanced Analogue Electronics

Version: 2023-24, v2.0, 14 Jun 2023

Contents

Part 1: Information

Module title: Advanced Analogue Electronics

Module code: UFMFVT-15-3

Level: Level 6

For implementation from: 2023-24

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Field: Engineering, Design and Mathematics

Module type: Module

Pre-requisites: Principles of Electrical Engineering 2021-22

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module builds upon the knowledge gained in Analogue Electronic Systems at level 5. Electronic systems can demonstrate complex characteristics due to high frequency signals as well as the non-linear behaviour and parameter variations of constituent passive and active components. Such behaviours will be discussed and analysed in this module. Standard design methodologies and practices will be covered. Furthermore, complex circuit topology such as differential and multi-stage amplifiers, and their cascaded operation will also be covered.

The material covered in this module is important because these devices are used in the design of communication and power systems amongst other common applications.

Features: Not applicable

Educational aims: This module equips the students with a clear understanding of the non-ideal behaviour of electronic components and their usage in complex electronic circuits that are used in many real-world applications

Outline syllabus: Typical course syllabus topics:

BJT Transistors as Amplifiers

Amplifier high frequency behaviour

Current-Mirrors and Active Loads

Differential Amplifiers

Multi-stage Amplifiers

Feedback and Stability

Component Sensitivity Analysis

Part 3: Teaching and learning methods

Teaching and learning methods: The delivery is intended to ensure that students have opportunity to develop practical lab-based skills alongside theoretical understanding of advanced analogue electronics concepts.

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Apply analytical methods and modelling techniques to the performance of electronic circuits in response to a range of externally applied stimuli

MO2 Use quantitative methods and appropriate computer software tools to solve engineering problems involving the analysis of electronic circuits

MO3 Explain and apply electronic principles and design guidelines to complex electronic systems and troubleshooting techniques

MO4 Analyse measured data from electronic circuits and correlate them against simulation/analytical formulae

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://rl.talis.com/3/uwe/lists/60B4B381-4C95-BCCC-783C-A47CCF48F16E.html?lang=en-GB&login=1

Part 4: Assessment

Assessment strategy: Assessment of this module consists of two major parts:

A coursework assessment (lab sessions) in regular intervals during the semester. This will be used to assess competency in the methods learned during the project-based work. Regular feedback and feed forward from the coursework is intended to assist students to prepare for the examination.

An examination at the end of the semester that assesses the student's understanding of design and analysis techniques learned during the lectures and tutorials, and their ability to apply them to real world problems or scenarios.

Resit strategy:

A coursework submission will be an individual report of an electronic system design and an experimental exercise that encompasses critical aspects of learning expected through the laboratory work.

An individual examination as described in the first sit assessment.

Assessment tasks:

Laboratory Report (First Sit)
Description: Coursework assessment (lab sessions) in regular intervals during the semester (max 1500 words)
Weighting: 50 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

Examination (First Sit)
Description: Written examination (2 hours)
Weighting: 50 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO3

Laboratory Report (Resit)
Description: Individual lab report (max 1500 words)
Weighting: 50 %
Final assessment: No
Group work: No
Learning outcomes tested: MO1, MO2, MO3, MO4

Examination (Resit)
Description: Written examination (2 hours)

Weighting: 50 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Electronic and Computer Engineering [Aug][FT][SHAPE][1yr] BEng (Hons) 2023-24

Electronic Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2021-22

Electronic and Computer Engineering [Sep][FT][Frenchay][3yrs] BEng (Hons) 2021-22

Electronic Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2020-21

Electronic Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2020-21

Electronic and Computer Engineering [Sep][SW][Frenchay][4yrs] BEng (Hons) 2020-21