ES2G4-15 Applied Electronics

21/22

Department
School of Engineering
Level
Undergraduate Level 2
Module leader
Christos Mias
Credit value
15
Assessment
40% coursework, 60% exam
Study location
University of Warwick main campus, Coventry

Description

Introductory description

Electronics find many applications in electromechanical engineering, such as in sensor interfacing and signal conditioning.

Module aims

The aim of this module is to provide learning in electronics, including the function of analogue electronic devices and common digital components. It will also provide the opportunity for students to design and develop electronic system through electronic circuit simulation, PCB layout and measurement tests with the aim to apply it at their place of work.

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.

Diodes, BJT's and FET's transistors and applications
Operational amplifiers. These will include instrumentation amplifiers and comparators
Basic digital electronics
Timers and oscillators
Sources of electrical noise, passive and active filters
CAD tools for electronic circuits
Voltage regulators

Learning outcomes

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

- Understand a range of different analogue electronic components and systems and basic digital components
- Combine different electronic components to create a system
- Appreciate specifications and design limitations and be able to design electronic systems to fulfil these
- Use CAD software to simulate electronic circuits and layout printed circuit board circuits

Indicative reading list

G. Rizzoni – Fundamentals of Electrical Engineering, McGraw-Hill, 2008.
Microelectronics Circuit Analysis and Design, Donald Neaman, 4e 2009.

Subject specific skills

Communicate technical information with others at all levels, including technical reports and the use of digital tools.
Follow a methodical approach to engineering problem-solving.
Produce electrical drawings using Computer-Aided Design(CAD).
Design functional electronic systems and circuits from the component level.
Plan, manage and lead engineering projects.
Perform risk management for engineering activities.
Comply with statutory and organisational safety requirements.
Communicate effectively with technical and non-technical audiences.

Transferable skills

Hold paramount the health and safety of themselves and others, and model health and safety-conscious behaviour.
Self-motivated, work independently and take responsibility for their actions. Set themselves challenging personal targets and make their own decisions.
Communicate confidently to create and maintain working relationships. Be respectful.
Prioritise quality. Follow rules, procedures and principles in ensuring work completed is fit for purpose, and pay attention to detail/error checks throughout activities.
Adjust to different conditions, technologies, situations and environments and to new and emerging technologies.
Exercise responsibilities in an ethical manner, with openness, fairness and honesty.
Commit to personal learning and professional development.

Study

Study time

Type	Required
Lectures	4 sessions of 1 hour (3%)
Tutorials	5 sessions of 1 hour (4%)
Demonstrations	3 sessions of 1 hour (3%)
Supervised practical classes	5 sessions of 3 hours (13%)
Work-based learning	80 sessions of 1 hour (70%)
Online learning (scheduled sessions)	8 sessions of 1 hour (7%)
Online learning (independent)	(0%)
Total	115 hours

Private study description

35 hours of guided independent learning (including VLE use)

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
Electronic Design Assignment	40%	
Specify, design, develop and test an electronic circuit at work place		
Online Examination	60%	
QMP		
~Platforms - AEP,QMP		

Feedback on assessment

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

Past exam papers for ES2G4

Availability

Courses

Course availability information is based on the current academic year, so it may change.
This module is Core for:

- Year 2 of DESA-H360 Undergraduate Electromechanical Engineering (Degree Apprenticeship)