ES2F5-15 Sensors

24/25

Department
School of Engineering
Level
Undergraduate Level 2
Module leader
Duncan Billson
Credit value
15
Module duration
10 weeks
Assessment
100% exam
Study location
University of Warwick main campus, Coventry

Description

Introductory description

Sensors

Module web page

Module aims

By the end of the module students should be able to understand basic theory relevant to sensors and their interfacing.

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.

Introduction to sensors and their performance characteristics
Temperature Sensors
Electric and Magnetic Sensors
Optical Sensors
Acoustic Sensors
Microwave Sensors

Mechanical Sensors
Sensor Interfacing (including wireless interfacing)
Transmission Lines and Time Domain Reflectometry
Introduction to Reliability

Learning outcomes

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

- Analyse signal propagation in transmission lines [C1, M1(D)]
- Consolidate knowledge of the theoretical/operational principles of sensors and sensor interfaces. [C2, M2(D), M4]]
- Solve problems, including design problems, involving sensors or sensor interfaces [M3, M4]
- Demonstrate knowledge of topics related to reliability [M14]

Indicative reading list

N. Ida, Sensors, Actuators, and Their Interfaces, 2nd edition, IET, 2020.
F.W. Ulaby and U. Ravaioli, Fundamentals of Applied Electromagnetics, 7th edition, Pearson, 2015.
P.D. O'Connor and A. Kleyner, Practical Reliability Engineering, 5th edition, Wiley, 2012.

View reading list on Talis Aspire

Subject specific skills

Ability to apply relevant practical and laboratory skills

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
Communicate (written and oral; to technical and non-technical audiences) and work with others
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

---

Study

Study time

Type	Required
Lectures	18 sessions of 1 hour (12%)
Seminars	6 sessions of 1 hour (4%)
Practical classes	3 sessions of 3 hours (6%)
Other activity	4 hours (3%)
Private study	113 hours (75%)
Total	150 hours

Private study description

113 hours of guided independent learning

Other activity description

Revision seminars

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group B1

	Weighting	Study time
Online Examination QMP online examination. ~Platforms - AEP,QMP	100%	

- Online examination: No Answerbook required

Feedback on assessment

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

Past exam papers for ES2F5

Availability

Courses

This module is Option list A for:

- Year 2 of UESA-H161 BEng Biomedical Systems Engineering
- Year 2 of UESA-H216 BEng Civil Engineering
- Year 2 of UESA-H63W BEng Electronic Engineering
- Year 2 of UESA-H113 BEng Engineering
- Year 2 of UESA-HH75 BEng Manufacturing and Mechanical Engineering
- Year 2 of UESA-HH35 BEng Systems Engineering
- UESA-H112 BSc Engineering
    - Year 2 of H112 Engineering
    - Year 2 of H112 Engineering
- Year 2 of UESA-H163 MEng Biomedical Systems Engineering
- Year 2 of UESA-H217 MEng Civil Engineering
- Year 2 of UESA-H63X MEng Electronic Engineering
- Year 2 of UESA-H114 MEng Engineering
- Year 2 of UESA-HH76 MEng Manufacturing and Mechanical Engineering
- UESA-HH31 MEng Systems Engineering
    - Year 2 of HH31 Systems Engineering
    - Year 2 of HH35 Systems Engineering
- Year 2 of UESA-H605 Undergraduate Electrical and Electronic Engineering
- Year 2 of UESA-H606 Undergraduate Electrical and Electronic Engineering MEng