

ES2F5-15 Sensors

22/23

Department

School of Engineering

Level

Undergraduate Level 2

Module leader

Duncan Billson

Credit value

15

Module duration

10 weeks

Assessment

30% coursework, 70% 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
- Point out underlying theoretical/operational principles of sensors and sensor interfaces.
- Solve problems, including basic design problems, involving sensors or sensor interfaces
- Demonstrate knowledge of topics related to reliability

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.

[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	20 sessions of 1 hour (13%)
Practical classes	3 sessions of 3 hours (6%)
Total	150 hours

Type	Required
Other activity	2 hours (1%)
Private study	119 hours (79%)
Total	150 hours

Private study description

122 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 D1

	Weighting	Study time
Assignment	30%	
Assignment (10 pages)		
Online Examination	70%	
QMP online examination.		
~Platforms - AEP,QMP		

- Online examination: No Answerbook required

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 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-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
- 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