

Module Title:	Mechatronic Applications	Level:	5	Credit Value:	20
----------------------	---------------------------------	---------------	---	----------------------	----

Module code:	ENG52E	Is this a new module?	Yes	Code of module being replaced:	
---------------------	--------	------------------------------	-----	---------------------------------------	--

Cost Centre:	GAME	JACS3 code:	H730
---------------------	------	--------------------	------

Trimester(s) in which to be offered:	1, 2 & 3	With effect from:	September 16
---------------------------------------------	----------	--------------------------	--------------

School:	Applied Science, Computing & Engineering	Module Leader:	Andrew Sharp
----------------	------------------------------------------	-----------------------	--------------

Scheduled learning and teaching hours	60 hrs
Guided independent study	140 hrs
Placement	0 hrs
Module duration (total hours)	200 hrs

Programme(s) in which to be offered	Core	Option
FdEng Industrial Engineering	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Pre-requisites
None

Derogations
A derogation from regulations has been approved for this module which means that whilst the pass mark is 40%, each element of assessment requires a minimum mark of 30% for the module to be passed overall.

Office use only

Initial approval June 16

APSC approval of modification *Enter date of approval*

Have any derogations received SQC approval?

Version 1

Yes No

Module Aims

To develop an in depth understanding of the synergistic combination of precision mechanical engineering, electronic control, software and embedded systems. Whilst utilising knowledge gained from other modules to appreciate their significance relative to mechatronics, e.g. PLCs

Intended Learning Outcomes

Key skills for employability

- KS1 Written, oral and media communication skills
- KS2 Leadership, team working and networking skills
- KS3 Opportunity, creativity and problem solving skills
- KS4 Information technology skills and digital literacy
- KS5 Information management skills
- KS6 Research skills
- KS7 Intercultural and sustainability skills
- KS8 Career management skills
- KS9 Learning to learn (managing personal and professional development, self-management)
- KS10 Numeracy

At the end of this module, students will be able to

Key Skills

At the end of this module, students will be able to		Key Skills	
1	Critically appraise the design of machines, devices and systems possessing a degree of computer based intelligence	KS1	
2	Develop knowledge the process of signal conditioning, data transfer and media types	KS5	
3	Develop knowledge relating to actuator devices	KS6	
		KS9	
4	Analyse mechatronic applications	KS3	
		KS5	

Assessment:

Both reports are to be based upon given 'technical problems' whereby the student is given details pertaining to a particular application. The student should (theoretically) produce a design solution to the given problem. This should include evidence of full consideration to the design possibilities and justification for the proposed stages involved with the solution.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)	Duration (if exam)	Word count (or equivalent if appropriate)
1	1 & 2	Report	50		2000
2	3 & 4	Report	50		2000

Learning and Teaching Strategies:

Lectures - presentation of theory, facts and concepts in order to convey critical information. Interaction or active learning should be implemented to develop an understanding of principles and concepts and stimulate discussion.

Case studies – examining systems and analysing the mechatronic aspects.

Laboratory work – A series of experiments embedding principles with practical considerations will be implemented.

Syllabus outline:

- Types and range of signals
- A-D and D-A converters
- Signal conditioning
- Data transfer and media types – including fibre optics
- Microprocessor systems
- Embedded systems
- Artificial Intelligence
- Concepts of software design methods
- Electromechanical devices
- Vision Systems
- Analysis of existing mechatronic systems

Bibliography:
Essential reading
AppuuKuttan. (2007) <i>Introduction to Mechatronics</i> , Oxford Higher Education W. Bolton (2011) <i>Mechatronics</i> , Prentice Hall
Other indicative reading
Dean Karnop (2012) <i>System Dynamics of Mechatronic Systems</i> , John Wiley & Sons