Module specification

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Refer to the module guidance notes for completion of each section of the specification.

Module code	ENG6AK
Module title	Mechatronics Applications
Level	6
Credit value	20
Faculty	FAST
Module Leader	Dr Mobayode Akinsolu
HECoS Code	100170
Cost Code	GAME

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
BEng (Hons) Mechatronics Engineering	Core

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	60 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	**0** hrs
Placement / work based learning	0 hrs
Guided independent study	140 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	24/09/2020
With effect from date	24/09/2020
Date and details of revision	
Version number	1

Module aims

This module aims to further develop the students understanding and concepts of mechanical/electrical control, by enhancing their knowledge of applications in mechatronic and industrial engineering so that they will be able to design a mechatronic system to meet an industrial specification.

Module Learning Outcomes - at the end of this module, students will be able to:

1	Apply knowledge and understanding gained from theoretical work and investigative work to solve mechatronic problems.
2	Demonstrate an understanding of mechatronic engineering and concepts.
3	Evaluate components and instruments, from manufacturers' data and principles of operation, in order to determine the most appropriate technology for a given application.
4	Plan, design and test a mechatronic system; mechatronics systems for industrial product inspecting, quality control and improvement.

Assessment

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Indicative Assessment Tasks:

The assessment is 100% in-course.

Assessment 1 - Portfolio of work relating to practical activities inclusive of log-book/diary. An appropriate technical level should be achieved and demonstrated through hardware design of a mechatronics system.

Assessment 2 - Presentation: to use pre-recorded presentation to provide a clear overview of the topic investigated including explanations and summary of results together with an analysis of their relevance, limitations and how the results relate to the objectives of the engineering design.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1, 2, 3, 4	Portfolio	80%
2	1, 2, 3, 4	Presentation	20%

Derogations

A derogation from regulations has been approved for this programme which means that whilst the pass mark is 40% overall, each element of assessment (where there is more than one assessment) requires a minimum mark of 30%.

Learning and Teaching Strategies

The module will be delivered through practical investigation/demonstrations and Computer Simulations in support of formal lectures and tutorials. Also there will be extensive use of VLE (Moodle) for additional support and formative work outside of timetabled contact periods.

Indicative Syllabus Outline

Modelling and simulation of dynamic processes: Different types of mathematical models for an industrial dynamic process; Mechanical/Electrical analysis-based modelling; Empirical databased modelling; Linear time invariant models; Model structure selection; Model parameter identification/estimation.
Analysis and simulation of a range of mechanical/electrical transducers and actuators for analogue/ digital interfaces such as; pressure/ heat/ chemical/ electromechanical/ optical.

Electronic interface design between the digital controller and the analogue/digital mechatronic processes to maximize the speed, efficiency and reliability of their operation.

Mechatronic systems design implementation using High level software industry standards, such as VEE /LabView and Matlab, and lower level control using Embedded micro controller functions. Use of PIC's, dedicated industrial microprocessors and PLC interfaces.

Design mechatronics systems for industrial automation, process quality control and improvement.

Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads

Shetty, D,; Richard, K.; (2012); Mechatronics System Design; CL Engineering.

Other indicative reading

Alciatore D.; (2012); Introduction to Mechatronics and Measurement Systems; McGraw-Hill.

Bagad V.S.; (2010) Mechatronics; Technical Publications Pune Bishop R.H.; (2002) Mechatronics handbook : CRC Press.

Web Links http://mechatronics.colostate.edu/book/video_demos.html

Employability skills – the Glyndŵr Graduate

Each module and programme is designed to cover core Glyndŵr Graduate Attributes with the aim that each Graduate will leave Glyndŵr having achieved key employability skills as part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas. Click here to read more about the Glyndwr Graduate attributes

Core Attributes
Creative
Ethical

Practical Skillsets
Digital Fluency
Critical Thinking
Communication