Module Definition Form (MDF)

Module code: MOD010260	**Version:** 1 **Date Amended:** 17/Apr/2024

1. Module Title
Mechatronic Design Project

2a. Module Leader
Mohammed Khan

2b. School
School of Engineering and the Built Environment

2c. Faculty
Faculty of Science and Engineering

3a. Level
4

3b. Module Type
Standard (fine graded)

4a. Credits
30

4b. Study Hours
300

5. Restrictions

Type	Module Code	Module Name	Condition
Pre-requisites:	None		
Co-requisites:	None		
Exclusions:	None		
Courses to which this module is restricted:	None		

LEARNING, TEACHING AND ASSESSMENT INFORMATION

6a. Module Description

Apply your learning through project based learning, where you will have both individual work and group work where you will be in a multidisciplinary range of students from the engineering group. This module is designed to provide you with a basic understanding of electrical and electronic engineering, from the in-class theoretical briefings to hands on practical activities. You will gain insight on the need of selecting the most appropriate electronic components, designing and building of basic mechatronic product. You will be introduced to modern programming software and simulation package.

6b. Outline Content

Building electronic circuits.
Analogue and digital transducers for mechanical and electronic interfacing.
Basic electronic principles
Operational amplifiers
DC and Stepper Motors
Pulse Width Modulation
Circuit simulation using suitable mechanical and electronic software packages
Practical integration of software and hardware.

6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

6d. Specialist Learning Resources

Mechanical/ electronic Workshop and Electronic simulation package.

7. Learning Outcomes (threshold standards)

No.	Type	On successful completion of this module the student will be expected to be able to:
1	Knowledge and Understanding	Understand basic knowledge of electronic principles
2	Knowledge and Understanding	Understand basic knowledge of electric motors and devices
3	Intellectual, practical, affective and transferrable skills	Analyse and design simple analogue and digital electronic circuits using mathematics and engineering principles
4	Intellectual, practical, affective and transferrable skills	Apply an integrated approach to solve complex mechatronics problems defined in a project
5	Intellectual, practical, affective and transferrable skills	Communicate complex engineering matters to a technical and non-technical audience

8a. Module Occurrence to which this MDF Refers				
Year	**Occurrence**	**Period**	**Location**	**Mode of Delivery**
2025/6	ZZF	Template For Face To Face Learning Delivery		Face to Face

8b. Learning Activities for the above Module Occurrence			
Learning Activities	**Hours**	**Learning Outcomes**	**Details of Duration, frequency and other comments**
Lectures	24	1-5	WKs 1- 7, 3 hours per week WKs 8-10, 1 hour per week WKs 8-10, 1 hour per week
Other teacher managed learning	28	1-5	WKs 1-7, 3 hours per week WKs 8-10, 5 hours per week WKs 11-12, 6 hours per week
Student managed learning	228	1-4	Self-directed learning
TOTAL:	280		

9. Assessment for the above Module Occurrence					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
010	Coursework	1-5	70 (%)	Fine Grade	30 (%)
Group electronic (hardware and integrated software) model building and logbook + Individual report (Equivalent to max 4500 words)					
Assessment No.	**Assessment Method**	**Learning Outcomes**	**Weighting (%)**	**Fine Grade or Pass/Fail**	**Qualifying Mark (%)**
011	Coursework	1,3,5	30 (%)	Fine Grade	30 (%)
1.5 Hour In-Class test (equivalent to 1500 words)					

In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).

In addition, students are required to:
(a) achieve the qualifying mark for each element of fine graded assessment as specified above
(b) pass any pass/fail elements

[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]