

## **BEng (Hons) Mechatronics Engineering - E441**

### **1. Objectives**

The Mechatronics course combines mechanical, electrical/electronic and computer modules in an attempt to demonstrate the close integration of these disciplines in product design. The Programme offers both theory and laboratory work designed to enable the students to understand the principles underlying the application of intelligent controllers in the control of machine components. The knowledge and skills gained will be useful to deal with a broad range of engineering products such as robotics, automated production systems, consumer goods and so on. The scheme of study also offers adequate background for further studies/research at graduate level and beyond both locally and abroad.

### **2. General Entry Requirements**

As per General Entry Requirements for admission to the University for Undergraduate Degrees.

### **3. Programme Requirements**

2 GCE 'A' Level Passes in Mathematics and one of the following subjects: Physics, Physical Science, Engineering Science, Physics with Chemistry, Design & Technology (Technology).

### **4. (i) Minimum Requirements for Degree Award – 133 Credits**

- For the degree award all core modules prescribed by the Department must be completed.
- Vacation Training & Industrial training must be completed satisfactorily for the award of the degree.

### **(ii) Minimum Requirements for Diploma Award**

A student may opt for a Diploma in Mechatronics provided s/he satisfies the following minimum requirements.

<b>MODULES</b>	<b>CREDITS</b>
Modules from Levels 1 & 2	54
Diploma Project	6
<b>TOTAL</b>	<b>60</b>

The Diploma project would normally be of 8 weeks duration for an input of at least 90 hours.

### **5. Programme Duration:**

Degree:	<b>Normal</b> 4 years	<b>Maximum</b> 7 years
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6. **Credits per Year:** Minimum 18, Maximum 48 subject to Regulation 5 above.

7. **Assessment**

Assessment will be based on a written examination of 2 to 3-hour duration (normally a paper of 2 hour duration for modules carrying less or equal to 3.5 credits and 3 hour paper for modules carrying four-six credits) and on continuous assessment done during the semester or year.

Written examinations for all modules, whether taught in semester 1 or in semester 2 or both, will be carried out at the end of the academic year (unless otherwise stated). The continuous assessment will count for **20% to 30%** of the overall percentage mark of the module(s), except for the module: Module MECH 1009Y(1) Engineering Graphics and Computer Aided Drafting

Module	Continuous Assessment	Exams
MECH 1009Y(1) Engineering Graphics and Computer Aided Drafting	50%	50%

Continuous assessment may be based on laboratory work, seminars and/or assignments and **should include at least two (2) assignments/ tests per semester/year per module.**

There will be at least one compulsory class test for all modules taught in semester 1 at the end of semester 1 of the given academic year unless stated otherwise in the Programme Structure.

An overall total of **40%** for combined assessment and written examination components would be required to pass the module, without minimum thresholds within the individual continuous assessment and written examination.

Special examinations (e.g. class tests) will be arranged at the end of semester 1 or semester 2 for exchange students who have registered only for one semester. In case of yearly modules, credits will be assigned on a pro-rata basis.

8. **Programme Plan – BEng (Hons) Mechatronics Engineering**

**YEAR/LEVEL 1**

Code	Module Name	Hrs/Wk L+P	Credits
<b>CORE</b>			
MECH 1001Y(1)	Mechanics of Materials & Machines I	2+1	5
MECH 1009Y(1)	Engineering Graphics and Computer Aided Drafting	2+2	6
CSE 1010e(1)	Introduction to Information Technology	O.E.	3
COMS 1010(1)	Communication Skills	D.E.	3
MATHS 1111(1)	Mathematics 1	D.E.	3
MATHS 1211(1)	Mathematics 2	D.E.	3
ELEC 1033Y(1)	Electrical Technology	3+1	7
ELEC 1031Y(1)	Electronics	2+1	5
ELEC 1032Y(1)	Basics of Computer Programming	1+2	4
MECH 1000	Vacation Training*	-	0 (I or S)

**YEAR/LEVEL 2**

Code	Module Name	Hrs/Wk		Credits
		L	P	
<b>CORE</b>				
MECH 2002Y(3)	Mechanics of Materials & Machines II	2	1	5
MECH 2005Y(1)	Thermofluids	2	1	5
MECH 2006Y(3)	Mechanical Processing of Materials	3	1	7
ELEC 2001Y(3)	Analytical Techniques	3	0	6
ELEC 3001Y(5)	Microprocessors	2	2	6

**SEMESTER CORE MODULES**

MECH 2019(3)	Project Appraisal Techniques	2	0	2
ELEC 2034(3)	Signals and Systems	3	0	3
ELEC 2032(3)	Electromechanical Systems	3	1	3.5
ELEC 2033(3)	Electrical Energy Systems	2	0	2

**YEAR/LEVEL 3**

Code	Module Name	Hrs/Wk		Credits
		L	P	
MECH 3003Y(5)	Drives and Controls	3	1	7

**SEMESTER CORE MODULES**

MECH 3062(5)	Engineering Management 1	3	0	3
MECH 3060(5)	Factory Automation	3	0	3
MECH 3064(5)	Engineering Design*	1	2	2
ELEC 3031(5)	Power Electronic Devices & Converters	3	1	3.5
ELEC 3032(5)	Control Engineering 1	3	0	3

**SEMESTER 2**

MECH 3000 Industrial Training will be done in Semester 2 of Level 3

\*To be assessed by continuous assessment only

**YEAR/LEVEL 4**

Code	Module Name	Hrs/Wk		Credits
		L	P	
MECH 4000Y(5)	Project	-	-	12
MECH 4007Y(5)	Robotics & Machine Intelligence	2	0	4
ELEC 4037Y(5)	Measurement & Control	2	0	4
ELEC 4012Y(5)	Digital Signal Processing	2	0	4

**SEMESTER 2 CORE MODULE**

MECH 4205(5)	Engineering Management II	3	0	3
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**ELECTIVES CHOOSE TWO, ONE FROM EACH DEPT****Mechanical**

MECH 4003(5)	Reliability & Safety Engineering	3	0	3
MECH 4008(5)	Automotive Electronics Systems	3	0	3
MECH 4014(5)	Mechanical Vibration	3	0	3

**Electrical**

ELEC 4002Y(5)	Power Electronic Drives	2+0	4
ELEC 4238(5)	Power Systems	3+0	3
ELEC 4239(5)	Control Engineering 2	3+0	3