

Liverpool John Moores University

Title: Mechatronics for Manufacturing A
Status: Definitive
Code: **4500MTC** (125781)
Version Start Date: 01-08-2019

Owning School/Faculty: Maritime and Mechanical Engineering
Teaching School/Faculty: Maritime and Mechanical Engineering

Team	Leader
Frederic Bezombes	Y

Academic Level: FHEQ4 **Credit Value:** 20 **Total Delivered Hours:** 39
Total Learning Hours: 200 **Private Study:** 161

Delivery Options

Course typically offered: Summer

Component	Contact Hours
Online	24
Practical	6
Tutorial	9

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Test	ASS1	VLE test	25	
Practice	ASS2	Laboratory activity	25	
Report	ASS3	Work based learning project	50	

Aims

This module provides an applied introduction to electronics, sensors, actuators, and programmable controllers and their integration into a programmable control system.

Learning Outcomes

After completing the module the student should be able to:

- 1 Analyse fundamental electrical circuits which include passive and active components
- 2 Apply a knowledge of sensors and actuators to correctly select them for a manufacturing application.
- 3 Program a simple micro-controller to execute a simple measurement and control task.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

VLE test	1
Laboratory activity	3
WBL project report	2

Outline Syllabus

Circuit analysis applying the fundamentals of current, voltage and resistance

- *Ohms Law, Conductivity & Resistance, Capacitance; Power & Dissipation of Losses, Magnetism & Inductance; Motor and generator effects, Power supplies*
- *Fundamentals of AC, Kirchhoff's Voltage and Current Laws; Resistive circuits in series and parallel;*
- *Active electrical circuits incorporating transistors and diodes*

Characteristics and application of sensors and actuators;

- *Temperature, Proximity, Pressure, Level and flow rate, Position (displacement), Force and inertia, Vision, Electro-mechanical actuators*

Micro-controllers

- *Microcontroller systems architecture, interfacing, fundamental programming*

Learning Activities

On-line lectures and tutorials, campus based tutorials and practicals, work based learning

Notes

This module covers the essential elements of electrical circuits, and electronics, programmable control systems relevant to mechanical and manufacturing engineering. Knowledge will be further developed by application to a work based learning project.

