Introduction to Electronics and Control

Module Information

2022.01, Approved

Summary Information

Module Code	4174CSD
Formal Module Title	Introduction to Electronics and Control
Owning School	Engineering
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 4
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Engineering

Learning Methods

Learning Method Type	Hours
Practical	33
Workshop	11

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-CTY	CTY	January	12 Weeks

Aims and Outcomes

Aims	This module introduces the fundamental concepts of electronics and control, through theory and practical applications in the laboratory. The concepts of simple program design, as an essential tool for modern device development, will be outlined. Work will be undertaken individually and will also be developed within teams.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Apply fundamental knowledge of analogue and digital electronics
MLO2	2	Demonstrate knowledge of mathematics and electrical engineering theory to the selection of electronic components
MLO3	3	Create a program to operate embedded intelligent controllers
MLO4	4	Design basic control algorithms and circuits

Module Content

Outline Syllabus	SI Units Ohms law, measurement of voltage, current and resistance. Basic components (Resistors, Capacitors, LED's), Basic Transistor operation (NPN transistors as switches), Operational amplifiers (inverting, non-inverting amplifiers, voltage follower).Logic Gates and Implementation: DeMorgan's Theorems. Combinational logic and Boolean algebra expression from logic diagrams and truth tables. Truth tables from logic diagrams and Boolean expressions. Commutative, associative and distributive properties. K-Map from truth table and Boolean expression.Embedded Controllers: Digital I/O, Analog I/O, PWM, Program designHigh level language constructs: variables, conditional statements, loops, string handling, input-output, data structures, functions
Module Overview	
Additional Information	This module introduces the fundamentals of applied mathematics and electronics, both theoretically and through practical application, building circuits in laboratories. You will also learn to write simple code as a tool for engineering.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Presentation	Interim Presentation & Design	30	0	MLO1, MLO2, MLO4
Presentation	Final Presentation & Demo.	70	0	MLO2, MLO3, MLO4

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Qian Zhang	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings