Liverpool John Moores University

Title:	Introduction to Electronics and Control
Status:	Definitive
Code:	**4164PDE** (121696)
Version Start Date:	01-08-2021
Owning School/Faculty:	Engineering
Teaching School/Faculty:	Engineering

Team	Leader
Qian Zhang	Y
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Academic Level:	FHEQ4	**Credit Value:**	20	**Total Delivered Hours:**	44
Total Learning Hours:	200	**Private Study:**	156		

Delivery Options
Course typically offered: Semester 2

Component	Contact Hours
Practical	33
Workshop	11

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Presentation	Design	Interim Presentation and Design	30	
Technology	Demo	Final Presentation and Demonstration	70	

Aims

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. You will work both individually and as part of a group during this module.

Learning Outcomes

After completing the module the student should be able to:

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

Learning Outcomes of Assessments

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

Idea design and plan	1	2	4
Final demonstration	2	3	4

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 design
High level language constructs: variables, conditional statements, loops, string handling, input-output, data structures, functions

Learning Activities

Lectures, tutorial, Demonstration and practical activities

Notes

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