**Liverpool** John Moores University

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|---|---|
| Title: | Electrical and Electronic Engineering |
| Status: | Definitive |
| Code: | **4107SBC** (124859) |
| Version Start Date: | 01-08-2021 |
| Owning School/Faculty: | Engineering |
| Teaching School/Faculty: | The Sino-British College |

| Team | Leader |
|---|---|
| Michael Shaw | Y |

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| **Academic Level:** | FHEQ4 | **Credit Value:** | 20 | **Total Delivered Hours:** | 68 |
| **Total Learning Hours:** | 200 | **Private Study:** | 132 | | |

**Delivery Options**
Course typically offered: Semester 2

| Component | Contact Hours |
|---|---|
| Lecture | 44 |
| Tutorial | 22 |

**Grading Basis:** 40 %

**Assessment Details**

| Category | Short Description | Description | Weighting (%) | Exam Duration |
|---|---|---|---|---|
| Exam | AS2 | Examination | 60 | 2 |
| Test | AS1 | Tests | 40 | |

**Aims**

*To enable students to develop an understanding of the physical principles of electrical and electronic systems, and to analyse simple circuits which incorporate passive and active components.*

**Learning Outcomes**

After completing the module the student should be able to:

1 Describe and model the physical principles of electrical and electronic systems.
2 Analyse circuits which include passive electrical components.
3 Analyse circuits which include active electronic components.

**Learning Outcomes of Assessments**

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

| | | | |
|---|---|---|---|
| Examination | 1 | 2 | 3 |
| Test | 1 | 2 | 3 |

**Outline Syllabus**

*Physical Principles of Electrical & Electronic Systems*

- *Charge, Current and Voltage*
  - *Ohms Law*
- *Conductivity & Resistance*
- *Power & Dissipation of Losses*
- *Capacitance*
- *Magnetism & Inductance*
- *Motor and generator effects*
- *Electrochemical & Batteries (increasingly important given hybrid systems)*
- *Semi-conductors*
  - *P-type, N-type*
  - *Diodes and Transistors*
- *Basic Operational Amplifiers*
- *Fundamentals of A.C. (Sinusoids, Phasors etc)*

*Electrical Circuits*

- *Kirchhoff's Voltage and Current Laws (LO1 & LO2)*
- *Resistive circuits in series and parallel (LO2)*
- *Simple inductive and capacitive circuits (LO2)*
  - *RC, RL and RLC circuits*
  - *Complex representation*
- *Active Electrical Circuits (LO3)*
  - *Transistor and diode circuits.*
  - *Inverting & Non-Inverting Amplifiers*
  - *Summing, Integrating and Differentiating Circuits.*
- *Useful engineering circuits (LO2 & LO3)*
- *Instrumentation, sensors and measurement (LO1, LO2 & LO3)*

## Learning Activities

Lectures and tutorials

## Notes

This module is designed to provide an introduction to Electrical and Electronic Engineering relevant to the fields of Mechanical, Automotive and Marine Engineering. The module covers the essential concepts associated with DC and AC circuits, electromechanical systems and instrumentation