

Liverpool John Moores University

Title: ELECTRICAL SYSTEMS ENGINEERING
Status: Definitive
Code: **3004ENG** (105563)
Version Start Date: 01-08-2016

Owning School/Faculty: Electronics and Electrical Engineering
Teaching School/Faculty: Electronics and Electrical Engineering

Team	Leader
Mahamoud Ahmed	Y

Academic Level: FHEQ3 **Credit Value:** 12 **Total Delivered Hours:** 38
Total Learning Hours: 120 **Private Study:** 82

Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	24
Tutorial	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Test	AS1	CW1	20	
Test	AS2	CW2	20	
Test	AS3	In-class test	10	
Exam	AS4	Examination	50	2

Aims

To extend and enhance the electrical science/technology elements studied in 3000ENG, to include capacitance, magnetic fields, electromagnetic induction, semiconductors and digital and analogue signals and to focus on how electrical/electronic technology underpins real world applications.

Learning Outcomes

After completing the module the student should be able to:

- 1 Calculate the capacitance, energy and charge stored in simple capacitors and combinations of capacitors.
- 2 Analyse electrical and magnetic fields in basic systems
- 3 Describe circumstances in which electromagnetic induction will occur and carry out simple calculations in electromagnetic induction.
- 4 Explain what is meant by digital and analogue signals and what kind of data they can represent.
- 5 Describe the behaviour of intrinsic and extrinsic semiconductors and fundamental semiconductor devices

Learning Outcomes of Assessments

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

problem solving exercise 1	1				
problem solving exercise 2	4	5			
in-class test	1	2			
EXAM	1	2	3	4	5

Outline Syllabus

Electric fields and potential gradients.

Capacitance, capacitors in parallel and series, energy storage on capacitors.

Magnetic fields and magnetic forces on current carrying conductors.

Electromagnetic induction including Faraday's and Lenz's laws.

Analogue and digital signals and number systems.

Semiconductors: intrinsic and extrinsic semiconductors; p and n type materials

Diodes, field effect and bipolar transistors.

Learning Activities

Full lecture and tutorial programme focused on real world examples

Notes

This module looks at basic electrical science/technology elements including capacitance, magnetic fields, electromagnetic induction, semiconductors and digital and analogue signals and focuses on how electrical/electronic technology underpins real world applications.

