

## Liverpool John Moores University

Title: ELECTRICAL SYSTEMS ENGINEERING  
Status: Definitive  
Code: **3004ENGPT** (119544)  
Version Start Date: 01-08-2016

Owning School/Faculty: General Engineering Research Institute  
Teaching School/Faculty: General Engineering Research Institute

Team	Leader
David Harvey	Y

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

### Delivery Options

Course typically offered: Semester 1

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.

