

# Engineering Principles

## Module Information

2022.01, Approved

### Summary Information

Module Code	4301ELE
Formal Module Title	Engineering Principles
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
Lecture	44
Tutorial	22

### Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-CTY	CTY	September	12 Weeks

### Aims and Outcomes

Aims	This module is intended to provide students with a good appreciation of - the physical properties and behaviours that influence electrical systems, - how parameters are measured-communications systems
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**After completing the module the student should be able to:**

**Learning Outcomes**

Code	Number	Description
MLO1	1	Identify appropriate sensors and apply basic measurement principles
MLO2	2	Describe basic physical parameters such as heat, temperature, stress and strain and their impact on electrical systems
MLO3	3	Discuss the principles of communications systems and networks
MLO4	4	Solve simple problems in communications systems and networks

**Module Content**

Outline Syllabus	Units, precision, accuracy Measurement systems, transducers and sensors Error analysis Heat, temperature Forces, stress, strain Sensors for mechanical parameters Gyroscopes, position and orientation The effect of the physical environment on electrical systems Sine Waves – Frequency, Phase, Amplitude; Time and frequency domain representation; Spectrum – Bandwidth and Frequency response Propagation – fibre, copper, radio; Signal Strength; power and energy; dB Noise and Interference; SNR Baseband– binary line coding, detection, timing, differential codes, block codes, Passband –modulation, AM, FM Digital and Analogue– comparison, uses, conversion, sampling
Module Overview	This module is intended to provide you with a good appreciation of:  <ul style="list-style-type: none"> <li>• the physical properties and behaviours that influence electrical systems</li> <li>• how parameters are measured</li> <li>• communications systems.</li> </ul>
Additional Information	This module will introduce students to fundamental mechanical parameters, their measurement, and their impact on electrical circuits, and the principles behind the communication of data. Where this module is part of a Degree Apprenticeship programme, the knowledge learning outcomes is K5.

**Assessments**

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Centralised Exam	Exam	60	2	MLO1, MLO2, MLO3, MLO4
Test	Online exercises	40	0	MLO1, MLO2, MLO3, MLO4

**Module Contacts**

**Module Leader**

Contact Name	Applies to all offerings	Offerings
Yongqiang Qiu	Yes	N/A

**Partner Module Team**

Contact Name	Applies to all offerings	Offerings
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