Foundation Physics - Particles, Fields and Electricity

Module Information

2022.01, Approved

Summary Information

Module Code	3505USST
Formal Module Title	Foundation Physics - Particles, Fields and Electricity
Owning School	Engineering
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 3
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

Partner Teaching Institution

Institution Name
University of Shanghai For Science and Technology

Learning Methods

Learning Method Type	Hours
Lecture	33
Tutorial	22

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
JAN-PAR	PAR	January	12 Weeks

Aims and Outcomes

Aims	The aim of this module is to provide students who may not have studied A-level physics with the prerequisite knowledge regarding particles, fields, electricity and electronics which is required to go on to study for an engineering or technology degree.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Characterise the constituent parts of the atom, their charge and mass, how they determine the size of the nucleus and the forces that govern their behaviour.
MLO2	2	Explain the behaviour of simple resistive circuits and apply the equations which characterise them.
MLO3	3	Illustrate basic techniques to determine the behaviour of digital components and systems.
MLO4	4	Describe simple fields and their applications mathematically.
MLO5	5	Model the behaviour of semiconductors

Module Content

Outline Syllabus	The list below provides an indicative list of topics which may be covered in this module:Essential Knowledge• Base units • SI Units• Prefixes describing size or quantity• Converting between equivalent unitsElectric Circuits• Charge, current and potential difference• Electromotive force (e.m.f.), and internal resistance• Current-voltage characteristics• Resistivity• Electromotive force• Alternating currentsElectronic Principles• Standard circuit symbols in circuit diagrams; • Measuring instruments; • lumped parameter abstraction to analyse circuits; • Passive and active components to generate, process and display signals; • Truth tables, Boolean algebra and graphs to represent the transfer characteristics of components and systems. • The concepts of conductors and insulators in terms of the mobility of charge; • Semiconductors• Electrical Power • The conversion of energy from electrical to other forms as charge moves round a circuit; • The behaviour of currents at a junction, KIL; • The voltage across a series circuit is the sum of the voltage across the components, KVL; • The current in a series circuit is the same in all the components. Particles• Constituent parts of the atomFields• Electric fields, Coulomb's law, electric field strength and electric potential• Magnetic fields, magnetic flux, charge moving in a magnetic field.• Capacitance• Electromagnetic induction
Module Overview	
Additional Information	This module looks at the fundamentals of particles, fields, electricity and electronics, using the maths developed during the Foundation Mathematics modules.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Exam	End of year examination	50	2	MLO1, MLO2, MLO3, MLO4, MLO5
Essay	On-line tests	50	0	MLO1, MLO2

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
John Marsland	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings