IMPERIAL

Module Specification

Basic details

UID		Cohorts covered	Earliest cohort: La:
Long title	Mathematics 1A		
New code	ELEC40013	New short title	
Brief description of module *(approx. 600 chars.)*	Mathematics is the foundation of all engineering practices and therefore this mathematics module is the umbrella onto which many engineering modules are attached. The approach to the material comes in two ways. On the one hand, lectures cover rigorous mathematical principles to ensure depth of knowledge that is, on the other hand, closely related to the engineering applications where the fundamental mathematical principles are brought to life in an engineering context. These		
	772 characters		
Available as a standalone module/ short course?	N		

Statutory details

	ECTS	CATS	Non-credit		
Credit value	7.5	15	N	HECOS codes	
FHEQ level	Level 4				

Allocation of study hours

	Hours	
Lectures	36	
Group teaching	18	*Incl. seminars, tutorials, problem classes.*
Lab/ practical	0	
Other scheduled		*Incl. project supervision, fieldwork, external visits.*
Independent study	133.5	*Incl. wider reading/ practice, follow-up work, completion of assessments,*
Placement		*Incl. work-based learning and study that occurs overseas.*
Total hours	187.5	
ECTS ratio	25.00	

Project/placement activity

Is placement activity allowed?	No

Module delivery

Delivery mode	Taught/ Campus	Other	
Delivery term	Term 1	Other	

Ownership

Primary department	Electical and Electronic Engineering
Additional teaching departments	
Delivery campus	South Kensington

Collaborative delivery

Collaborative delivery?	N

External institution	N/A
External department	N/A
External campus	N/A

Associated staff

Role	CID	Given name	Surname
Module Leader		Daniel	Nucinkis

Learning and teaching

Module description

Learning outcomes	Upon successful completion of both parts of this module you will be able to: 1. apply the techniques of single-variable calculus to obtain solutions to a wide variety of applications of differentiation and integration. 2. utilize the concepts of complex number, functions, limits and series to unify the topics of the term. 3. identify and apply the correct approach to solving different types of first- and second-order ordinary differential equations. 4. explain and apply the concepts and techniques of multivariable calculus and tackle problems in their appropriate context. 5. explain where and how the mathematical concepts are applied in engineering problems in electromagnetism, signal processing and communications.
Module content	Part A: Complex Numbers, Functions, Limits, Differentiation, Integration, Series, First- and Second-order Differential Equations, Multivariable Calculus, part 1. Where appropriate, maths examples will be linked to engineering applications and further reading is available on blackboard to extend insight and knowledge. The applications of several topics will be further explored in Topics in Electrical Engineering.
Learning and Teaching Approach	The lectures will be taught in a large lecture theatre to the whole year group using a classical blackboard and chalk approach and the visualiser. These lectures will be recorded for revision purposes. There will be two problem classes per week: one will be held in medium groups, with lecturer and TAs answering questions one-to-one; in the other, the year group meets in a large lecture theatre and questions are answered by the lecturer at the board. The focus in problem classes will be on applying the techniques seen in lectures to a variety of problems ranging from the easy to the difficult, with the chance to ask questions and get one-to-one help. In tutorial groups of 3-4 students you will have the opportunity to solve a selection of problems with your personal tutor.
Assessment Strategy	There will be a low-stake half-term test in November. Areas where a larger number of students show a weakness in understanding of concepts will be identified and discussed during the drop-in sessions. The exam will be held in the first week after the Christmas break. Before the Spring term exam takes place, problem solving classes and drop-in sessions will give you an opportunity to resolve any remaining questions.

Feedback	Feedback will be given after half-term test. General problems will be discussed during the problem classes. The feedback on the exam will be made available as written comments on the exam example answer sheets after the September examiners' meeting.
Reading list	G. James: Modern Engineering Mathematics; Riley/Hobson/Bence: Mathematical Methods for Physics and Engineering; K Stroud: Engineering Mathematics.
Required equipment/ software	NA

Quality assurance

Date of first approval	
Date of last revision	January 2025
Date of this approval	
Module leader	Daniel Nucinkis
Notes/ comments	

Office use only

QA Lead	
Department staff	
Date of collection	
Date exported	
Date imported	

Template version ##

Assessment details

Grading method	Numeric	Pass mark	40%

Assessments

Assessment type	Assessment description	Weighting	Pass mark	Must pass?
Practical	Mid term test in Autumn (Maths1A)	10%	40%	N
Examination	Start of Spring term exam (Maths1A)	90%	40%	N
		100%		