

MODULE TITLE	Foundations	CREDIT VALUE	0
MODULE CODE	MTH1000	MODULE CONVENER	Dr John Bruun (Coordinator)
DURATION: TERM	1	2	3
DURATION: WEEKS	11	11	0
Number of Students Taking Module (anticipated)		300	

DESCRIPTION - summary of the module content

University level mathematics differs from that taught in schools not only in the difficulty of the topics and higher abstraction, but also in the style of teaching. This module aims to ease the transition to university level mathematics by bridging the gap between mathematics taught prior to university level, and the material covered in the first year of our mathematics degree, including the programming languages which will be taught in depth in other modules. The module eases you into a university teaching and learning environment and helps revise material from A-level. You will revisit essential skills in algebra, coordinate geometry, vectors, series and sequences, as well as some topics which are covered in Further Mathematics A-level such as complex numbers, matrix algebra, differential equations, and Maclaurin series. In this module, you will go over the theory and see many solved examples, as well as practice many examples to master these essential topics. Attending the lectures of this module is highly recommended to those students who do not have an A-level in Further Mathematics or equivalent, but those who do can also utilise these sessions to review the material and gain more practise experience. This module will also provide the skills needed to communicate mathematics which is a vital skill in all modules to be taken throughout a mathematics course.

AIMS - intentions of the module

This module aims to support the transition to year 1 undergraduate mathematics with elements of revision and self-study.

INTENDED LEARNING OUTCOMES (ILOs) (see assessment section below for how ILOs will be assessed)

On successful completion of this module, you should be able to:

Module Specific Skills and Knowledge:

- 1 manipulate algebraic and numerical expressions accurately and with confidence;
- 2 compute with vectors, matrices and complex numbers;
- 3 perform accurate calculus manipulations using a variety of standard techniques;
- 4 sketch the graphs of a variety of functions of one variable;
- 5 recognise and solve equations involving logarithmic, exponential, trigonometric and hyperbolic functions;
- 6 find the general term of a sequence or series.

Discipline Specific Skills and Knowledge:

- 7 manipulate basic mathematical objects necessary in order to progress to successful studies in the mathematical sciences;
 - 8 communicate mathematics effectively and clearly
- Personal and Key Transferable/ Employment Skills and Knowledge:
- 9 formulate and solve problems and communicate reasoning and solutions effectively in writing; 9 use learning resources appropriately;
 - 10 exhibit self management and time management skills.
 - 11 understand the foundations of coding using MATLAB and R
 - 12 communicate ideas and plans in a clear and concise way

SYLLABUS PLAN - summary of the structure and academic content of the module

Functions: logarithmic; exponential; trigonometric; hyperbolic. Partial fractions; binomial theorem.
 Basic vector arithmetic; coordinates in plane; basic matrix arithmetic. Complex numbers: definitions & arithmetic; representations.
 Differentiation & integration.
 Graph sketching.
 Sequences and series: sigma notation; recursion formula.
 Polar coordinates.
 The basics of coding using MATLAB and R.
 Notation and convention in mathematical statements.
 Patterns of mathematical statements and how to convey them.

LEARNING AND TEACHING

LEARNING ACTIVITIES AND TEACHING METHODS (given in hours of study time)

Scheduled Learning & Teaching Activities	84.00	Guided Independent Study	36.00	Placement / Study Abroad
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DETAILS OF LEARNING ACTIVITIES AND TEACHING METHODS

Category	Hours of study time	Description
Lectures	30	6 x 2-hour lectures
Scheduled learning and teaching activities	12	Tutorials
Scheduled learning and teaching activities	6	Tutorials
Scheduled learning and teaching activities	66	Drop-in mathematics surgeries
Guided independent study	36	Self-study using online learning resources and quizzes

ASSESSMENT

FORMATIVE ASSESSMENT - for feedback and development purposes; does not count towards module grade

Form of Assessment	Size of Assessment (e.g. duration/length)	ILOs Assessed	Feedback Method
Online quizzes	6 x 1 hour	All	Electronic
Exercise sheets	6 x 3 hours	All	Tutor feedback

SUMMATIVE ASSESSMENT (% of credit)

Coursework	0	Written Exams	0	Practical Exams	0
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DETAILS OF SUMMATIVE ASSESSMENT

Form of Assessment	% of Credit	Size of Assessment (e.g. duration/length)	ILOs Assessed	Feedback Method
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Form of Assessment	% of Credit	Size of Assessment (e.g. duration/length)	ILOs Assessed	Feedback Method
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DETAILS OF RE-ASSESSMENT (where required by referral or deferral)

Original Form of Assessment	Form of Re-assessment	ILOs Re-assessed	Time Scale for Re-reassessment
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RE-ASSESSMENT NOTES

This module is not formally assessed and is to support the transition to year 1 only.

RESOURCES

INDICATIVE LEARNING RESOURCES - The following list is offered as an indication of the type & level of information that you are expected to consult. Further guidance will be provided by the Module Convener

Basic reading: Any A-level texts on mathematics and further mathematics

ELE: <http://vle.exeter.ac.uk>

Reading list for this module:

Type	Author	Title	Edition	Publisher	Year	ISBN	Search
Set	McGregor, C., Nimmo, J. & Stothers, W.	Fundamentals of University Mathematics	2nd	Horwood, Chichester	2000	000-1-898-56310-1	[Library]

CREDIT VALUE	0	ECTS VALUE	0
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PRE-REQUISITE MODULES	None
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CO-REQUISITE MODULES	None
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NQF LEVEL (FHEQ)	4	AVAILABLE AS DISTANCE LEARNING	No
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ORIGIN DATE	Tuesday 10 July 2018	LAST REVISION DATE	Thursday 26 January 2023
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KEY WORDS SEARCH	Partial fractions; binomial; calculus; differentiation; integration; complex numbers; vectors; matrices; series; sequences, coding basics, communicating mathematics.
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