

# MA142-10 Calculus 1

**23/24**

**Department**

Warwick Mathematics Institute

**Level**

Undergraduate Level 1

**Module leader**

Roger Tribe

**Credit value**

10

**Module duration**

10 weeks

**Assessment**

Multiple

**Study location**

University of Warwick main campus, Coventry

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## Description

### Introductory description

Mathematical Analysis is the heart of modern Mathematics. Calculus usually stands for Analysis, focused on calculations rather than proving theorems. This module is the first in a series of modules where the subject of Analysis is developed with a focus on calculations.

### Module aims

The principal aim is to develop Analysis in dimension 1, with much greater precision and rigour than the students had at school. While the high-school Analysis is focusing on problem solving methods, the university-level Analysis is switching the focus to the mathematical concepts and clarity of thought.

### Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

- Real numbers
- Limits
- Series
- Continuity

- Uniform continuity

## Learning outcomes

By the end of the module, students should be able to:

- develop deep understanding of the real numbers and the symbol 'infinity'
- develop working knowledge of sequences and series, including limits, conditional and absolute convergence
- learn the properties of continuous and absolutely continuous functions

## Indicative reading list

M. Hart, Guide to Analysis, Macmillan.

M. Spivak, Calculus, Benjamin. R.G Bartle and D.R Sherbert, Introduction to Real Analysis (4th Edition), Wiley (2011)

L. Alcock, How to think about Analysis, Oxford University Press (2014)

[View reading list on Talis Aspire](#)

## Subject specific skills

Calculus gives first-year undergraduates a first excursion in to pure mathematics. The students will gain a new perspective and a deeper understanding of familiar mathematics which they have seen in school (e.g. real numbers, functions and differentiation). In Calculus, these concepts are developed with mathematical rigour, which characterises much of university mathematics to follow.

## Transferable skills

Students will acquire key reasoning and problem solving skills, empower them to address new problems with confidence.

## Study

### Study time

Type	Required
Lectures	20 sessions of 1 hour (48%)
Online learning (independent)	9 sessions of 1 hour (21%)
Placement	13 hours (31%)
Total	42 hours

## Private study description

No private study requirements defined for this module.

## Costs

No further costs have been identified for this module.

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## Assessment

You do not need to pass all assessment components to pass the module.

### Assessment group D

	Weighting	Study time
Assignments	15%	20 hours
In-person Examination	85%	38 hours

- Answerbook Pink (12 page)

### Assessment group R

	Weighting	Study time
In-person Examination - Resit	100%	

- Answerbook Pink (12 page)

## Feedback on assessment

Marked homework (both assessed and formative) is returned and discussed in smaller classes. Exam feedback is given.

[Past exam papers for MA142](#)

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## Availability

## Courses

This module is Core for:

- USTA-G302 Undergraduate Data Science
  - Year 1 of G302 Data Science
  - Year 1 of G302 Data Science

- Year 1 of USTA-G304 Undergraduate Data Science (MSci)
- UCSA-G4G1 Undergraduate Discrete Mathematics
  - Year 1 of G4G1 Discrete Mathematics
  - Year 1 of G4G1 Discrete Mathematics
- Year 1 of UCSA-G4G3 Undergraduate Discrete Mathematics
- Year 1 of USTA-G300 Undergraduate Master of Mathematics, Operational Research, Statistics and Economics
- USTA-Y602 Undergraduate Mathematics, Operational Research, Statistics and Economics
  - Year 1 of Y602 Mathematics, Operational Research, Stats, Economics
  - Year 1 of Y602 Mathematics, Operational Research, Stats, Economics