MA141-10 Analysis 1

23/24

Department
 Warwick Mathematics Institute
Level
 Undergraduate Level 1
Module leader
 James Robinson
Credit value
 10
Module duration
 10 weeks
Assessment
 Multiple
Study location
 University of Warwick main campus, Coventry

Description

Introductory description

Mathematical Analysis is the heart of modern Mathematics. This module is the first in a series of modules where the subject of Analysis is rigorously developed.

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.

- Inequalities
- Real numbers
- Sequences of 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

Analysis 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 Analysis, 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%)
Private study	13 hours (31%)
Total	42 hours

Private study description

Working on assignments, going over lecture notes, text books, exam revision.

Costs

No further costs have been identified for this module.

Assessment

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

Assessment group D

	Weighting	Study time	Eligible for self-certification
Assignments	15%	20 hours	No
In-person Examination	85%	38 hours	No

- Answerbook Pink (12 page)

Assessment group R

	Weighting	Study time	Eligible for self-certification
In-person Examination - Resit	100%		No

- Answerbook Gold (24 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 MA141](#)

Availability

Courses

This module is Core for:

- Year 1 of UMAA-G105 Undergraduate Master of Mathematics (with Intercalated Year)
- Year 1 of UMAA-G100 Undergraduate Mathematics (BSc)
- UMAA-G103 Undergraduate Mathematics (MMath)
  - Year 1 of G100 Mathematics
  - Year 1 of G103 Mathematics (MMath)
- Year 1 of UMAA-G106 Undergraduate Mathematics (MMath) with Study in Europe
- Year 1 of UMAA-G1NC Undergraduate Mathematics and Business Studies
- Year 1 of UMAA-G1N2 Undergraduate Mathematics and Business Studies (with Intercalated Year)
- Year 1 of UMAA-GL11 Undergraduate Mathematics and Economics
- Year 1 of UECA-GL12 Undergraduate Mathematics and Economics (with Intercalated Year)
- Year 1 of UMAA-G101 Undergraduate Mathematics with Intercalated Year