Course information 2026-27

MT2116 Abstract Mathematics

General information

MODULE LEVEL: 5

CREDIT: 30

NOTIONAL STUDY TIME: 300 hours

MODE: Locally Taught, Independent Learner Route and Online Taught

Summary

This course is an introduction to formal mathematical reasoning, in which proof is central. It introduces fundamental concepts and constructions of mathematics and looks at how to formulate mathematical statements in precise terms. It then shows how such statements can be proved or disproved. It provides students with the skills required for more advanced courses in mathematics.

Conditions

Please refer to the relevant programme structure in the EMFSS Programme Regulations to check:
- where this course can be placed on your degree structure; and
- details of prerequisites and corequisites for this course.

You should also refer to the Exclusions list in the EMFSS Programme Regulations to check if any exclusions apply for this course.

Aims and objectives

This course is designed to enable students to:

- develop their ability to think in a critical manner
- formulate and develop mathematical arguments in a logical manner
- improve their skill in acquiring new understanding and expertise
- acquire an understanding of basic pure mathematics and the role of logical argument in mathematics.

Learning outcomes

At the end of the course and having completed the essential reading and activities students should be able to:

- use mathematical notation to formulate mathematical concepts and statements precisely.
- recall key important definitions and results.
- use logical argument and various proof techniques to prove or disprove mathematical statements.
- use techniques learned in the course to solve a variety of standard problems in discrete mathematics, analysis and algebra.
- approach and solve new, unseen, problems in an analytical and logically precise way.

Employability skills

Below are the three most relevant employability skills that students acquire by undertaking this course which can be conveyed to future prospective employers:

1. Complex problem solving
2. Adaptability and resilience
3. Communication

Essential reading

For full details, please refer to the reading list

Biggs, Norman L. Discrete Mathematics. (Oxford: Clarendon Press, 2003) second edition [ISBN 978-0198507178]

Eccles, P.J. An Introduction to Mathematical Reasoning; numbers, sets and functions. (Cambridge University Press, 1997) [ISBN 978-0521597180]

Bryant, Victor. Yet Another Introduction to Analysis. (Cambridge University Press, 1990) [ISBN 978-0521388351]

Assessment

This course is assessed by a three-hour and fifteen-minute closed-book written examination.

Syllabus

This course is an introduction to mathematical reasoning. Students are introduced to the fundamental concepts and constructions of mathematics. They are taught how to formulate mathematical statements in precise terms, and how such statements can be proved or disproved.

The course is designed to enable students to:
- develop their ability to think in a critical manner
- formulate and develop mathematical arguments in a logical manner
- improve their skill in acquiring new understanding and expertise
- acquire an understanding of basic pure mathematics, and the role of logical argument in mathematics.

Topics covered are: Logic, integers, sets and functions, prime numbers, relations, real and complex numbers, greatest common divisor and modular arithmetic, infimum and supremum, sequences, limits of sequences, functions and limits of functions, continuity, groups.