THE UNIVERSITY of ADELAIDE COLLEGE

Mathematical Methods

Foundation Studies Program

Aims

The aim of the Mathematical Methods course is to prepare students for university courses that require significant ability and knowledge of mathematics. It is relevant for students entering degree programs with an emphasis on mathematical skills such as Mathematics, Engineering, Computer Science, and some science courses, such as Chemistry and Physics that have mathematical content. Mathematical Methods is also advantageous for students embarking on courses such as Economics, Finance, Design Science, Architecture, Medicine and Dentistry.

Mathematical Methods introduces the students to calculus and statistics and then develops an increasingly complex and sophisticated understanding of these topics. By using functions and their derivatives and integrals, and by mathematically modelling physical processes, students develop an understanding of the physical world through a knowledge of relationships involving rates of change. Students use statistics to describe and analyse phenomena that involve uncertainty and variation.

Mathematical Methods provides the foundation for further study in mathematics, economics, computer sciences, and the sciences. It prepares students for courses and careers that may involve the use of statistics, such as health or social sciences. When studied together with Specialist Mathematics, this subject can be a pathway to engineering, physical science and laser physics.

Learning outcomes

After successfully completing this subject students should be able to:

- Have knowledge of content and an understanding of mathematical concepts and relationships.
- Use mathematical algorithms and techniques (implemented electronically where appropriate) to find solutions to routine and complex questions.
- Apply knowledge and skills to answer questions in applied and theoretical contexts, including some attempts at proof.
- Develop solutions to mathematical problems set in applied and theoretical contexts.
- Interpret mathematical results in the context of the problem.
- Understand the reasonableness and possible limitations of the interpreted results, and recognise any assumptions made.
- Communicate mathematical ideas and reasoning to develop logical arguments, including some attempt at proof in applied and/or theoretical contexts.
- Use appropriate mathematical notation, representations, and terminology.

Assessment

General weightings for each assessment item are outlined below.

ASSESSMENT ITEM	WEIGHTING
Tests	40%
Assignments	7%
Projects (2)	8%
Mid-year examination	15%
Final examination	30%

Prerequisites and assumed knowledge

Mathematics to an Australian Year 11 standard.

Subject content

WEEK	TOPIC AND ASSESSMENT SCHEDULE
1	Orientation week
2 - 4	Algebraic preliminaries, introduction to graphics calculator, exponents and logarithms
5 - 7	Relations and functions and their graphs
8 - 11	Differential calculus
12 - 17	Applications of differential calculus
18 - 19	Exam revision
20	Exams
21 - 22	Introductory Statistics
23 - 26	Integration
27 - 28	Applications of integration
29 - 30	Discrete random variables
31 - 33	Continuous random variables and the normal distribution
34	Sampling distributions
35 - 36	Confidence intervals for the mean
37	Exam revision
38 - 39	SWOTVAC/Exams
40	Graduation

Further enquiries

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