F17GA Problem Solving

COURSE DETAILS

Course Code: F17GA
Full Course Title: Problem Solving
SCQF Level: 7
SCAF Credits: 15
Available as Elective: No

DELIVERY LEVEL

Undergraduate: Yes  Postgraduate Taught: No  Postgraduate Research: No

Additional Information:

COURSE AIMS

The main module aims are to give the students the opportunity to

- to tackle a variety of problems involving elementary mathematics
- to work as a member of a team
- to produce written reports
- to make presentations

In addition to the above the students will use Maple to develop skills in using modern algebraic manipulation systems as a tool for applying mathematics and performing mathematical experiments.

LEARNING OUTCOMES – SUBJECT MASTERY

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

- be familiar with basic solution strategies for mathematical problems, e.g. consideration of examples, numerical experimentation or generalisation
- evaluate the information contained in a problem and adopt a suitable solution strategy
- translate a problem into a form that allows for a mathematical formulation and, if possible, (partial) solution
- present mathematical arguments in a clear and precise way
- work in a small team
- discuss mathematical problems in a small group
- apply analytical and numeracy skills to real-life problems
- prepare and give a presentation in a team, using a computer
- use Maple as a calculator
- use Maple to solve equations and for matrix manipulations
- use Maple to compute limits, to differentiate and integrate
- use Maple to solve ODEs
F17GA Problem Solving

- use Maple to perform mathematical experiments

### LEARNING OUTCOMES – PERSONAL ABILITIES

- Demonstrate the ability to learn independently
- Demonstrate knowledge of an area of mathematics.
- Manage time, work to deadlines and prioritise workloads

### SYLLABUS

Problem solving: students will be given regular assignments on which they will work in small groups. The purpose of the assignments is to develop problem solving skills in mathematics via a series of examples taken from pure and applied mathematics.

Career planning: students will have an introduction into career opportunities for mathematics students.

The computer part of the course is divided into three sections

3. Calculus. Limits, differentiation and integration. Solving ordinary differential equations (ODEs) and recurrence relations.

### COURSE RELATIONSHIPS

N/A

### LOCATION AND ASSESSMENT METHODS

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