



MATH10002 - 2008/2009

General Information

- Title: Mathematical Workshop
- Unit code: MATH10002
- Credits: 10
- Prerequisites: A-Level Mathematics, MATH10141 *Probability and Statistics 1*
- Co-requisite units: None
- School responsible: Mathematics
- Members of staff responsible: Dr. [Louise Walker](#) and Dr. [Peter Foster](#)

Specification

Aims

The aims of this course unit are to help students

- use Matlab to solve mathematical problems;
- reinforce and develop statistics ideas taught in MATH10141;
- develop practical statistical skills.

Brief Description of the unit

The first five weeks of the course will give an introduction to the mathematical software package Matlab. In the second half of the course students will study introductory statistics and use Minitab to work on practical applications of statistical theory.

Learning Outcomes

On successful completion of this course unit students will be able to

- use Matlab to solve equations, plot functions and perform matrix calculations;
- understand introductory statistics;
- use Minitab to analyse statistical data.

Future topics requiring this course unit

The approaches to problem solving will be beneficial in later Mathematical study. The statistics content is required for MATH20802 *Statistical Methods* and MATH20812 *Practical Statistics 1*.

Content

- Week 01: Introduction to Matlab.
- Week 02: Using Matlab to plot functions and solve equations.
- Week 03: Using Matlab to work with matrices.
- Week 04: Simple programming in Matlab.
- Week 05: Matlab project.
- Weeks 06 to 11: Statistics lectures and laboratory:
 - Population and samples, sample statistics;
 - Sampling distributions, how good are sample statistics as estimators of population parameters?
 - Likelihood and maximum likelihood estimators for discrete variables;
 - Confidence intervals;

- Hypothesis testing.

Textbooks

- Desmond J. Higham and Nicholas J. Higham, *MATLAB Guide*, Society for Industrial and Applied Mathematics, Philadelphia, PA, USA, Second edition 2005.

Teaching and learning methods

One lecture per week in weeks 1-5 and two lectures per week in weeks 6-11. One hour workshop per week. In addition students are expected to do at least five hours private study each week on this course unit.

Assessment

Weeks 1-5 (MATLAB): continuous assessment (30%).

Weeks 6-11 (Statistics): two projects (worth 35% of the marks for the Statistics component), an in-class test (worth 25% of the marks) and attendance and work at the computing laboratories (worth 10% of the marks).

Arrangements