Design and Computing 1

Introduction to Scientific Computing

Daniel Poole
Department of Aerospace Engineering
University of Bristol
d.j.poole@bristol.ac.uk

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COURSE OUTLINE

Lectures

One lecture (Monday 10-11am) a week for TB1, broken down as follows:

- Wk 1-7: Intro to programming in C
- Wk 8: Study week (no lecture)
- Wk 9-10: Intro to programming in MATLAB
- Wk 11-12: Scientific documents and other loose ends

Labs and Assessment (TB1)

Programming forms 25% of Design and Computing 1. There are 25 total marks available for the programming exercises and are assessed in class. One computer lab (Tuesday 2-4pm or 4-6pm) a week for TB1. **Groups alternate every week**.

- Wk 2-7: 5 simple examples (in C) based on lectures
  - Each pass/fail – 1 mark per exercise – Completed **by the end of lab in week 7**.
- Wk 8: Study week (no lab)
- Wk 9-10: 2 simple examples (in MATLAB) based on lectures
  - Each pass/fail – 1 mark per exercise – Completed **by the end of lab in week 12**.
- Wk 11-12: 1 more in-depth example (in MATLAB)
  - 3 marks – Completed **by the end of lab in week 12**.

Labs and Assessment (TB2)

TB2 forms a more major programming exercise, but is slightly more complicated (details will be given closer to the time):

- Will assess your ability to be given a problem and split this down into a programmable solution
- Have two consecutive lab sessions (the timetable for this will be released closer to the time)
- The assignment is worth a total of 15 marks

Extra Reading - C

This course is entirely self-contained, but for another point of view on C programming, try:

- Kernighan, B. W. and Ritchie, D. M. "The C Programming Language". Prentice Hall, 1988.

There are also a myriad of online self-teach courses and materials:

- Good all-rounder: `http://c.learncodethehardway.org/book/`
- Easy to use GUI: `http://www.learn-c.org/`
- MIT open courses: `http://ocw.mit.edu/courses/intro-programming/`
- etc.

Extra Reading - MATLAB

This course is entirely self-contained, but for further examples of MATLAB programming try:

- Hahn, B. D. and Valentine, D. T. "Essential MATLAB for engineers and scientists". Butterworth-Heinemann, 2007.

Also the official MATLAB tutorial (you will have to create a Mathworks account to access this)

- `https://uk.mathworks.com/support/learn-with-matlab-tutorials.html`