

MS4101

Mathematics Laboratory

September 4, 2017

Material for this course is freely available via the Web at
<http://jkcray.maths.ul.ie/ms4101.html>.

Purpose of Course

- Introduce the Matlab numerical programming language
- Introduce the L^AT_EX document preparation language
- Apply Matlab to the solution of simple numerical models
- Brief introduction to the Maple symbolic algebra package

1 Introduction

1.1 Timetable

- Lectures: Tuesday 11:00 S1–14 & Wednesday 09:00 EM–010.
- Labs: (from Week 2) Monday 14:00 & Tuesday 09:00 C2–062.
- From Week 3, a “catch-up” class will be held in C1–062 at 09:00 on Mondays when needed.

1.2 Structure of Course

- The course is based on the document “Introduction to Matlab” in <http://jkcray.maths.ul.ie/ms4101/IntroMatlabGriffiths.pdf>
- This material is made freely available by its author, David Griffiths.
- It may be copied freely provided the author’s rights are preserved.
- You should print a copy for your own use.
- You should buy a USB stick/flash memory drive for use in this & other modules.

- In the two lectures every week, new material from the “Introduction to Matlab” will be covered.
- The class is divided into two Groups (2A & 2B) for lab purposes.
- You must attend your assigned lab class each week (from Week 2) in C2-062 where each student will work with Matlab on a PC with help from the lecturer.
- In Week 2, a visiting lecturer will give an introduction to L^AT_EX, a free software package for mathematical document preparation.
- See <https://www.overleaf.com/> for a free cloud-based version of L^AT_EX (it doesn't need to be installed, just used from a web browser) and <http://jkcray.maths.ul.ie/ms4101/LaTeX-Files/> for the introductory L^AT_EX material for Week 2.
- At the end of Week 2 you will have a free Overleaf account configured and will be able to use it to prepare documents that just contain text (like this) or mathematics like this:

$$\int_0^{\infty} e^{-x} dx = 1.$$

- Without familiarity with L^AT_EX, you will not be able to complete your project.
- A copy of the Matlab software package will be made available to you free of charge for use on your laptop — details to be announced.
- In the meantime
 - The Octave software package is a free implementation of most of the features of Matlab.
 - It may be downloaded from <https://www.gnu.org/software/octave/download.html>

1.3 Assessment

- A Matlab project will be assigned midway through the semester for at least 30% of your grade for the module.
- A PC-based end-of-semester assessment will determine the remainder of your grade.
- An attendance record will be kept.