CS3081

Computational Mathematics

Introduction

Timetable:

Lectures: Fridays 10.00-12.00 in LB01

Lectures/Tutorial: Fridays 2.00-3.00 in LB01

Assessment:

Assessment is 100% by exam.

Students are strongly encouraged to do the problems in the text in preparation for this exam. The exam will also require that students are highly proficient in MATLAB.

Summary:

In this course we will cover the fundamentals of Computational Mathematics. It is understood that that you study the MATLAB language yourselves and become highly proficient at it. You will be examined on it in conjunction with the Computational Mathematics material covered in the course.

Text:

1. Numerical Methods for Engineers and Scientists – 3rd Edition by Amos Gilat and Vish Subramaniam
2. Matlab – An Introduction with Applications – 5th Edition by Amos Gilat

Text 1. is absolutely essential. We will be following this text very closely (Ch. 1-6, Ch. 8-9). Text 2. is also essential though we will not be following this book *per se* in lectures.

Examinable Material:

1. All material covered in lectures and tutorials is examinable The MATLAB language is also examinable. Students are expected to become highly proficient at this.

2. A very good introduction to the MATLAB language can be found in the appendix to the main text. The supplementary MATLAB text is also very helpful. Also, MATLAB learning resources are available on the website: http://uk.mathworks.com/

3. All material (including problems – though there will be a subset of recommended problems to solve) in Chapters 1-6 and Chapters 8-9 of Numerical Methods for Engineers and Scientists 5th Edition).

4. Any additional notes/material given.

Course Outline:

Chapter 1. Introduction
Chapter 2. Mathematical Background
Chapter 3. Solving Nonlinear Equations
Chapter 4. Solving a System of Linear Equations
Chapter 5. Eigenvalues and Eigenvectors
Chapter 6. Curve Fitting and Interpolation
Chapter 8. Numerical Differentiation
Chapter 9. Numerical Integration