

KMA254

Differential Equations, Linear Algebra and Applications 2

Lectures

This subject will be taught by Prof Larry Forbes in 2012. There are 3 lectures per week as follows:

Tuesday 10 am	Phys. Lecture Theatre 3 – note the change of venue
Wednesday 11 am	Phys. Lecture Theatre 2
Thursday 11 am	Phys. Lecture Theatre 2

Tutorials and Labs

There will be one tutorial each week, as follows:

Tuesday 12 noon Maths Computer Annex 254.

The tutorials will involve some regular problem solving on the whiteboard, and we will also use the computer package *MATLAB*. This enables us to draw lovely graphs, which is helpful in visualizing curves and surfaces. It can also help us do quite sophisticated tasks in matrix algebra, and it removes a lot of the tedium of matrix work, so that we can concentrate on the ideas. We will also use *MATLAB* to solve some differential equations and graph their solutions. This is a really good way of gaining a visual understanding of how differential equations work, and it is also an important part of the toolbox of a modern scientist. I won't examine *MATLAB* in the final exam, but packages like this are now a part of the tool-kit of a modern scientist or engineer, and you really ought to know your way around some of them. Besides, playing with *MATLAB* is fun.

Assessment

The assessment for this subject consists of a 2 hour exam that counts for 70% of the grade. The remaining 30% will be come from assessment during the semester. The assessment during the semester will consist of the weekly assignments in linear algebra and differential equations. Some of these assignments are expected to involve *MATLAB*.

Reference Texts

A good reference text for this unit is

E. Kreyszig, *Advanced Engineering Mathematics*, 9th edition, Wiley (2006), New York.

There are many other excellent books on differential equations, and some of these will be available in the library.

Some useful references for the linear algebra material in this unit are

Introduction to Linear Algebra, 2nd edition, G. Strang (Wellesley-Cambridge Press 1998)

Elementary Linear Algebra, 3rd edition, R.E. Larson and B.H. Edwards (D.C. Heath and Co. 1996).

Perhaps a slightly tougher book is

Linear Algebra and Differential Equations using MATLAB, M. Golubitsky and M. Dellnitz (Brooks/Cole Publishers 1999).

These will be on my website, at

<http://www.maths.utas.edu.au/People/Forbes/KMA254.html>