DEPARTMENT OF MATHEMATICS AND STATISTICS

SEMESTER 1 2005

620-151 Introduction to Biomedical Mathematics

Course Information

1. Is this the correct Mathematics subject for me?

The subject 620-151 Introduction to Biomedical Mathematics is intended primarily for students who are enrolled in the first year of the Bachelor of Biomedical Science degree. Such students normally would take

620-151 Introduction to Biomedical Mathematics (sem 1); and
620-152 Introduction to Biomedical Statistics (sem 2).

The assumed background is a good result in VCE Mathematical Methods 3/4.

If you are a Bachelor of Biomedical Science student who has obtained a good result in VCE Specialist Mathematics (e.g. Study Score over 40) then you *may* prefer to attempt 620-121 Mathematics A (Advanced), in order to keep open the option of major studies in Mathematics and Statistics. Nonetheless, please be assured that you are very welcome to take 620-151, and you will find challenges within it.

2. Lecture Classes

The subject 620-151 Introduction to Biomedical Mathematics has three weekly lecture classes: Monday 9-10, Wednesday 9-10, and Friday 9-10.

The first lecture is on Monday February 28th, and the last is on Friday May 27th. Lectures are to be held in the Laby Theatre.

3. Tutorial Classes

Each student will attend one tutorial class each week, at a time and place to be arranged: tutorial class lists and locations will appear on the Mathematical Sciences Notice Board on Wednesday March 2nd.

In the first tutorial, the tutors will explain the purpose of tutorials in the teaching program. Each student is expected to submit a number of homework assignments to his/her tutor throughout the semester.

4. Assessment

There are three items of assessment for 620-151:

(i) a mid-semester test held during a regular lecture time (9-10) Friday 22nd April. (15%);

(ii) homework assignments marked by your tutor during the semester (10%);

(iii) a three-hour written examination in June (75%).

The final mark for 620-151 will be compiled as follows:

Suppose your mid-semester test mark is T (maximum 15), your assignment mark is A (maximum 10) and your examination mark is E (maximum 75).
Then your final mark for 620-151 is either (T + A + E) or (A + 6E/5) , whichever is the greater. Thus, if your mid-semester test is a disaster then it need not count in your assessment, and your June examination result will be scaled to a mark out of 90 instead of 75.

Please note that it is University policy that students sign a statement concerning plagiarism for all non-exam assessment. The assignments in 620-151 are such non-exam assessment. You will be asked to sign such a statement at the beginning of semester that will cover all your assignment work in 620-151.

5. Calculator

Students in 620-151 will require a scientific calculator, especially for the calculation of values of trigonometric, logarithmic and exponential functions. As most students will be also enrolled in 620-152 in second semester it is advised that students should obtain a calculator with basic statistics functions.

Some students may own a graphics calculator (such as a CASIO 9850G or TI82). Students who have become proficient in the use of a graphics calculator during their years in secondary school are encouraged to use it during the semester in 620-151. For instance, the arithmetic associated with row operations on matrices is easily and accurately done on a graphics calculator. However, graphic calculators will NOT be allowed in the mid-semester test or the end-of-semester examination.

So as far as the assessment in 620-151 is concerned, a scientific calculator will be allowed in the mid-semester test and the end-of-semester examination.

6. Textbook

The textbook for 620-151 is APPLIED MATHEMATICS FOR BUSINESS, ECONOMICS, LIFE SCIENCES AND SOCIAL SCIENCES (seventh or eighth edition) by Raymond A Barnett, Michael R Ziegler and Karl E Byleen (B Z & B), published by Prentice-Hall. The text will often be referred to in lectures, and all students in 620-151 are *strongly urged* to acquire their own copy. The lecturer will sometimes set reading from particular sections of the text. There is some trade in second-hand copies of the sixth edition of this book (authored by Barnett and Ziegler only). There are only minor differences between the sixth, seventh and eighth editions, so if you can acquire a copy of the sixth edition, that will be quite satisfactory.

In the following example sheets, the "suggested extra practice examples" refer to pages in the seventh edition of the text. At the end of this booklet there is an equivalent listing of "suggested extra practice examples" with sixth and eighth edition references.

7. Example Sheets

There are eleven Example Sheets (see following pages). You are strongly advised to attempt all the questions on the Example Sheets, and also to do as many of the suggested Extra Questions from the text book as time allows: your tutor will advise which examples are crucial.

The material of each lecture should be reviewed briefly (perhaps only requiring 10 minutes) on the day it is given, because this action raises long term retention of concepts and techniques and reduces the need for later revision. You should also refer to the relevant sections of the text soon after meeting material in lectures, and occasionally before lectures. The problems on the Example Sheets should be attempted within a week of the material being given in lectures. Please do not get behind with the problem sheets.

8. Course Plan

Example Sheet/Topic		*Reading*
1.	Linear equations	B Z & B 4-1, 4-2, 4-3.
2.	Matrices	B Z & B 4-4, 4-5, 4-6.
3.	Linear Programming (graphs)	B Z & B 5-1, 5-2.
4.	Linear Programming (simplex)	B Z & B 5-3, 5-4, 5-5.
5.	Differentiation	B Z & B Chapter 8, Chapter 10
6.	Rate Problems	B Z & B Chapter 8, Chapter 10.
7.	Differential Equations (DE)	B Z & B 14-1.
8.	Taylor Series	Calculus by Thomas and Finney (p 672-78 in 9th ed)
9.	Integration	B Z & B Chapter 11, Chapter 12.
10.	Linear and Separable DE	B Z & B 14-2, 14-3.
11.	Single population models	B Z & B 14-2, Calculus by Hughes-Hallett Ch 10 in 2nd or 3rd eds, Differential equations in Mathematical Biology by D. S. Jones and B. D. Sleeman early chapters.

Other reading material may be suggested from time to time. Depending on the time available an advanced topic on competing populations may be introduced but will NOT be examinable.

9. Help

The first source of help is the person beside you in lectures and tutorials, who is doing the same problems as you are and having similar but perhaps not exactly the same difficulties. Remember though, that fellow students have no obligation to help you, nor you to help them. Forming a small study group of two to four people is a preferred mode for "trading secrets" for many students.

The next source is your tutor: students are expected to attend all tutorials. Keep a list of problems and conceptual difficulties which you have, and ask your tutor for help with them at the tutorials.

There is a tutor-duty roster for students who want help between tutorials: attendance is purely voluntary, and the schedule for this service is on the Notice Board in the First Year Learning Centre. Your own tutor may or may not be one of the rostered tutors.

Finally, after reviewing your lectures and reading your textbook and talking with your fellow students and your tutor, what do you do if you still have a problem? You may particularly want to approach your lecturer if you have problems with concepts presented in a lecture. The hours when your lecturer is available will be listed on a notice on the door of Room 198 or on the subject website (links from the department's undergraduate web pages will be available – see http://www.ms.unimelb.edu.au).

If something major goes wrong, and you need to be absent for more than a couple of days, inform your lecturer or your tutor or the tutor coordinator – Sally Kuhlmann. If the matter is serious enough, you should apply for "Special Consideration" at your Faculty Office.

Andrew Rechnitzer (Room 198)
(620-151 lecturer and subject coordinator)

Sally Kuhlmann (Room G43)
(Tutor coordinator for 620-151)

Karen Baker (Room G41)
(Director of First Year Studies in Mathematics and Statistics)

February 7th, 2005.