



MACQUARIE  
UNIVERSITY ~ SYDNEY

Student Resource Centre  
Division of Economic & Financial Studies  
MACQUARIE UNIVERSITY

## STAT401/890 STOCHASTIC FINANCE

### COURSE INFORMATION: SEMESTER 2, 2004

#### LECTURER

Professor Barry Quinn

Room: C5C 466

Email: [bquinn@efs.mq.edu.au](mailto:bquinn@efs.mq.edu.au)

Phone: +61 2 9850 6475

Fax: +61 2 9850 7669

#### Aims

This unit aims to integrate a basic understanding of how financial markets work with the analytic tools for modelling their time-dependent structures. Since these structures are based on random ("stochastic") processes, stochastic models underpin the methods. Where feasible, analytical methods are developed. From the text book: The aim is to present as much financial theory about securities markets as possible without requiring the advanced mathematics that is associated with continuous time models.

*Target Audience:* Students with a major in Actuarial Studies, Statistics, or Finance.

*Prerequisite:* Basic probability theory (Stat272 or equivalent)

Text: Stanley R. Pliska, Introduction to Mathematical Finance: Discrete Time Models, Blackwell Publishing, 1997. [webpage](#)

Lecture notes, assignments and associated material will be available via WebCT. Login at <http://online.mq.edu.au>.

Time and Place: Thursday 6-9 in C5A 307

NOTE: Some examination questions in a related course in the UK are located at <http://www.maths.lse.ac.uk/Courses/ma310.html#exams>

#### WEBCT

We'll be using WebCT for discussions and information dissemination. I'll regularly post updates/corrections of lecture notes and assignments, etc. Please don't email me using WebCT – use my departmental email address.

## **DISTANCE MODE**

Distance students will receive lecture notes and assignments by mail. Please contact Leslie Mooney, the postgraduate administrator, if you feel the notes have gone astray. Her phone number is +61 2 9850 8550 and email address is [lmooney@efs.mq.edu.au](mailto:lmooney@efs.mq.edu.au).

Please send your assignment solutions to  
Professor B.G. Quinn  
Statistics Dept, EFS, Building C5C  
Macquarie University  
Sydney NSW 2109  
Australia.

## **COURSE WEBSITE**

There is a course website at  
<http://www.stat.mq.edu.au/units/stat401>

The login button will take you to the WebCT login screen.

## **PROGRAM**

Week 1: Introduction (Tim Kyng)  
Weeks 2, 3: Single Period Securities Markets  
Weeks 4, 5, 6, 7: Single Period Consumption and Investment  
Weeks 8, 9: Multiperiod Securities Markets  
Week 10: Binomial Option Pricing (Tim Kyng)  
Week 11: Credit risk modelling applications (Dr John Jarratt, head of Group Portfolio Unit, Westpac Banking Corporation)  
Weeks 12, 13: Binomial Option Pricing (ctd), Reverse Engineering (Tim Kyng)

## **ASSESSMENT**

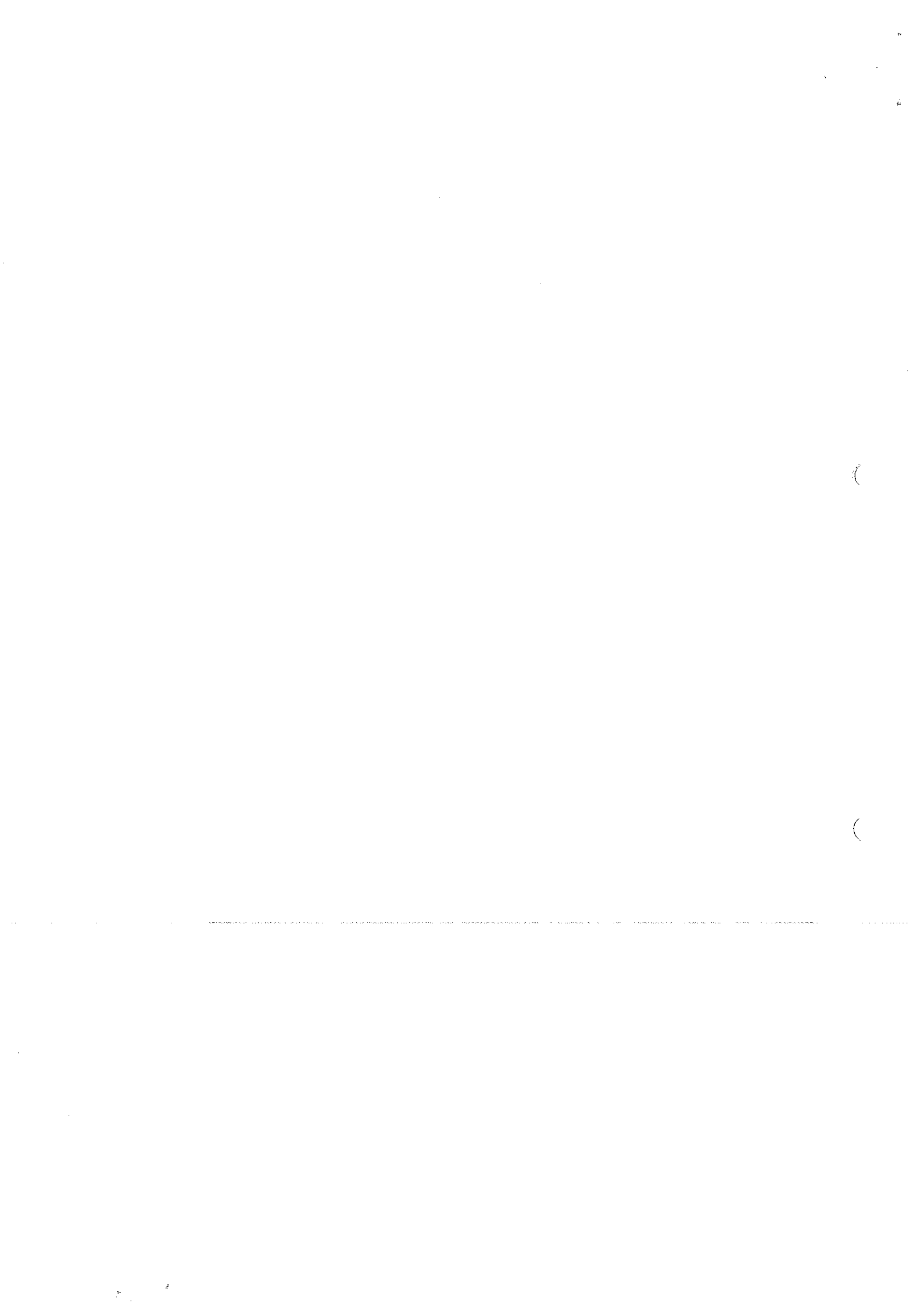
Assessment consists of:

Final exam	70%
3 Assignments	30%

Satisfactory performance is required in all aspects of the unit. Students who have not performed satisfactorily in the assignments will not be permitted to sit the examination.

A calculator and one (1) A4 sheet of summary notes written on one or both sides in the student's own handwriting may be taken into the final examination.





### Lectures :

You are required to attend three lectures per week, held at the following times :

Tuesday 9-10 (E7B-T2)      Wednesday 9-10 (E7B-T5)      Friday 9-10 (E7B-T4)

### Tutorials :

You are required to attend one tutorial per week. They will begin in the **second** week of semester. The tutorials will all be held in the C5C computer laboratories C5C-213 or C5C-217.

Wed 12-1      Wed 2-3      Thurs 10-11      Fri 12-1

The tutorials will be largely devoted to the use of the statistical package Minitab.

The work will not be required to be handed in but attendance will be recorded. **Solutions will not be made available.**

### Assignments :

You will be required to submit two assignments during the semester. Each will be worth 4 marks towards your final grade.

The assignments will be due **by 10 am** on the due date and should be left in the BIOL235 Assignment Box in ERIC (C5C-244). Marks will be deducted for work handed in late.

The due dates are:

Assignment 1      Friday, 10th September (Week 6)  
Assignment 2      Tuesday, 26th October (Week 11)

### Project :

Due Monday 8th November (beginning Week 13)      at 5pm in ERIC

The project requires you to collect data and analyse it yourself, using the methods of this course. The project is to be word-processed and should be in report form. Your data may have been collected in another biology unit or may be from an experiment that you have designed and set up yourself. **In either case, it is necessary that you have been involved in some way in the collection of the data.** More details will be given later.

### For assignments and the project :

Whilst you are encouraged to discuss the work extensively with your peers, it will be expected that the final work handed in will be your **own** work. Any work that is copied from another student may result in disciplinary action for **all** students involved. You should read the section headed "Plagiarism".

The assignments and project will not be marked unless it is accompanied, in each case, by a cover sheet which clearly shows your name, your tutor's name and your tutorial time and makes a declaration that the work is your own work.



**Assessment :**

The total mark will be made up as follows:

Assignments 1 and 2	8
Mid-semester test	8
Project	14
Final examination	70

In order to pass the course students must exhibit a satisfactory performance in all sections of the course.

**The assignments and the project are compulsory.**

**To pass the course, you must pass the final exam.**

For both the mid-semester exam and the final examination, you may bring into the examination one (1) sheet of A4 paper written on both sides in your own handwriting. No formulae will be provided, however all necessary statistical tables will be provided.

The Mid-semester exam will be held during one of the lectures in Week 7.

**Web Page :**

<http://www.stat.mq.edu.au/units/biol235>

**Course Schedule :**

One and two sample tests and confidence intervals - one and two tailed

Error rates

Normal plots, residuals and fitted values

Analysis of Variance - one factor

Multiple Comparisons l.s.d. procedure, Tukey's h.s.d., Bonferroni procedure, Dunnett etc

Two Factor Analysis of Variance

Interaction and Additivity

Two way Analysis of Variance without interaction

Transformations

Experimental design

Calculation of Power and Sample Size

Simple Linear Regression and Correlation

Multiple regression

Stepwise Regression

Logistic Regression





**DEPARTMENT OF BIOLOGICAL SCIENCES  
DIVISION OF ENVIRONMENTAL AND LIFE SCIENCES  
MACQUARIE UNIVERSITY**

**PLEASE NOTE THAT AN ADEQUATE PERFORMANCE IN ALL COMPONENTS OF A UNIT  
IS REQUIRED IN ORDER TO PASS.**

**EXAMINATIONS**

Students are directed to consult the "University Calendar" at the beginning of the year to determine the commencement and finishing dates of both University examination periods in order to ensure their availability to attend compulsory examinations. Failure to attend an examination can only be explained within the definition of 'unavoidable disruption' which can be found in the "University Calendar".

**SPECIAL CONSIDERATION REQUESTS**

**During Semester:**

All requests for special consideration should be submitted through the Student Centre, Registrar and Vice-Principal's Office. You must also provide your Lecturer with a copy of the documentation lodged at the Student Centre when submitting assignments. We strongly recommend that you see your Lecturer or Tutor on all such occasions to discuss the matter with her/him.

**During Examination Period:**

All requests for special consideration during the examination period must be submitted to the Registrar and Vice-Principal, through either the Student Centre or the Academic Program Section. These offices will provide the appropriate forms and advice. Copies of submissions are forwarded to the Department by these offices.

As well as submitting the appropriate documentation through the Registrar and Vice-Principal's Office, if you miss an examination, **YOU MUST CONTACT YOUR LECTURER WITHIN 72 HOURS OF THE DATE OF THE EXAMINATION** so that alternative examination arrangements may be made without delay. Failure to do so will result in the award of an "F" grade.

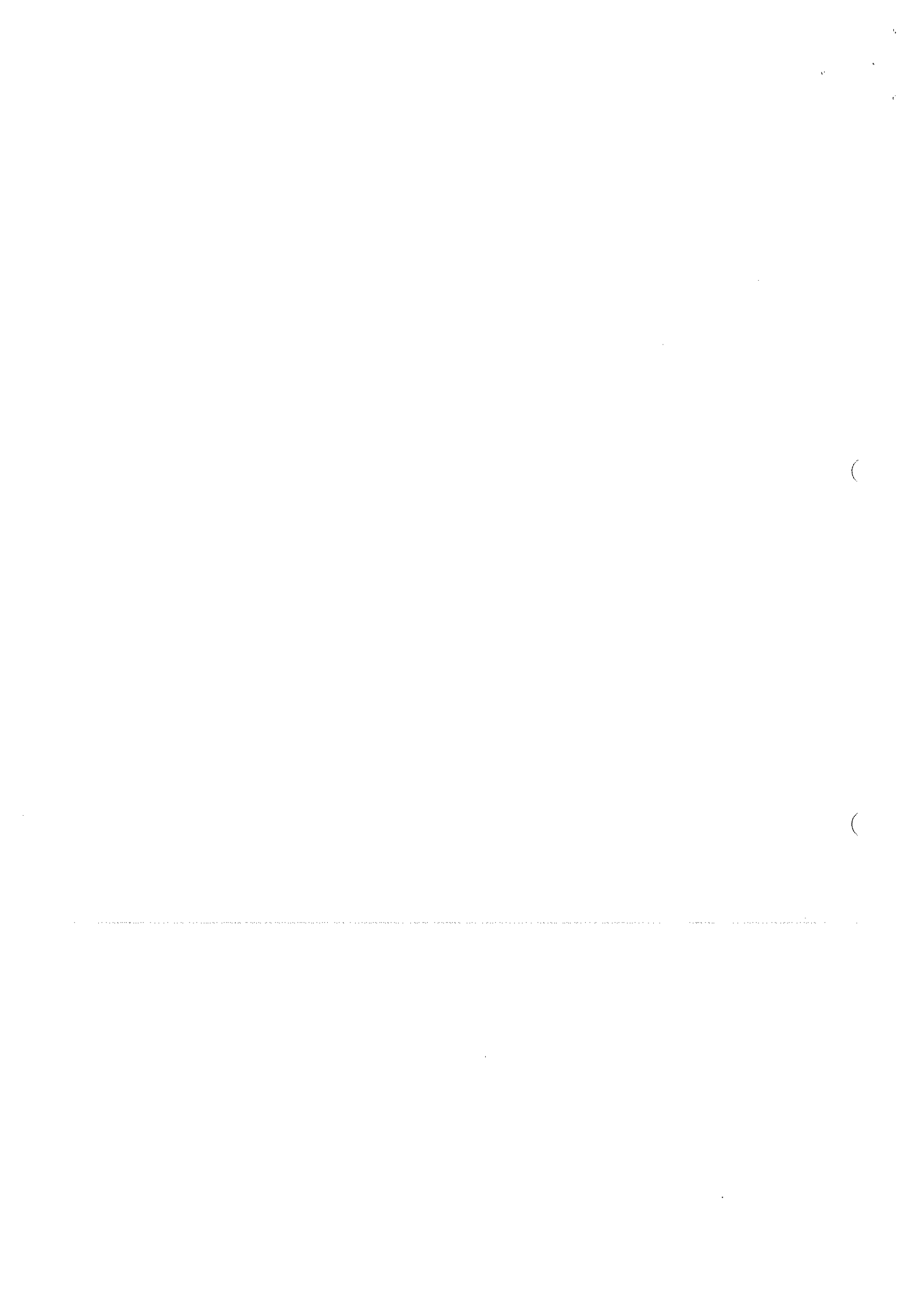
Please note that the submission of requests for special consideration is monitored by the Department. Repeated requests will result in referral of the student to the Dean of Students for discussion and advice.

**PLAGIARISM**

The definition of plagiarism is reproduced overleaf. ALL students are requested to read the definition. If you are still unsure about this issue, please see your Lecturer for further advice. Students submitting assignments through the Department's Student Assignment Office are required to read the definition of plagiarism on the back of the Student Assignment Cover Sheet. You must also sign the statement verifying that you have read the statement and that the assignment is entirely your own work except where referenced and the work has not been previously submitted in any formal course of study.

In the event that a Lecturer identifies a case of plagiarism, the student will be advised, either on the submitted work or by separate letter, and a record kept in the office of the Head of Department. Students will always have the opportunity to discuss each case with their Lecturer if they indicate they wish to do so by either contacting the Lecturer or the Head of Department. Proven cases of plagiarism may result in the award of an "F" grade.

***IF YOU HAVE ANY QUERIES RELATING TO THESE ISSUES,  
PLEASE CONTACT YOUR LECTURER OR THE HEAD OF DEPARTMENT OF BIOLOGICAL  
SCIENCES.***



## PLAGIARISM

Academic Senate in September, 1992 adopted the following definition of plagiarism.

Plagiarism involves using the work of another person and presenting it as one's own. Any of the following acts constitutes plagiarism unless the source of each quotation or piece of borrowed material is clearly acknowledged:

- (a) copying out part(s) of any document or audio-visual material (including computer-based material);
- (b) using or extracting another person's concepts, experimental results, or conclusions;
- (c) summarising another person's work;
- (d) in an assignment where there was collaborative preparatory work, submitting substantially the same final version of any material as another student.

Encouraging or assisting another person to commit plagiarism is a form of improper collusion and may attract the same penalties.

Senate also approved a document entitled *The Dangers of Plagiarism and How to Avoid it*. The text of the statement is as follows:

### *The Dangers of Plagiarism and How to Avoid it*

The integrity of learning and scholarship depends on a code of conduct governing good practice and acceptable academic behaviour. One of the most important elements of good practice involves acknowledging carefully the people whose ideas we have used, borrowed, or developed. All students and scholars are bound by these rules because all scholarly work depends in one way or another on the work of others.

Therefore, there is nothing wrong in using the work of others as a basis for your own work, nor is it evidence of inadequacy on your part, **provided you do not attempt to pass off someone else's work as your own.**

To maintain good academic practice, so that you may be given credit for your own efforts, and so that your own contribution can be properly appreciated and evaluated, you should acknowledge your sources and you should **ALWAYS**:

- (i) state clearly in the appropriate form where you found the material on which you have based your work, using the system of reference specified by the School in which your assignment was set;
- (ii) acknowledge the people whose concepts, experiments, or results you have extracted, developed, or summarised, even if you put these ideas into your own words;
- (iii) avoid excessive copying of passages by another author, even where the source is acknowledged. Find another form of words to show that you have thought about the material and understood it, but remember to state clearly where you found the ideas.

If you take and use the work of another person without clearly stating or acknowledging your source, you are falsely claiming that material as your own work and committing an act of **PLAGIARISM**. This is a very serious violation of good practice and an offence for which you will be penalised.

**YOU WILL BE GUILTY OF PLAGIARISM** if you do any of the following in an assignment, or in any piece of work which is to be assessed, **without clearly acknowledging your source(s) for each quotation or piece of borrowed material:**

- (a) Copy out part(s) of any document or audio-visual material, including computer-based material;
- (b) Use or extract someone else's concepts or experimental results or conclusions, even if you put them in your own words;
- (c) Copy out or take ideas from the work of another student, even if you put the borrowed material in your own words;
- (d) Submit substantially the same final version of any material as a fellow student. On occasions, you may be encouraged to prepare your work with someone else, but the final form of the assignment you hand in must be your own independent endeavour.

(Macquarie University Academic Manual 2000, pp 33-34)

Assignments are to be your own work. Using someone else's words (either another student's or from a book or journal article or a web site) without clear acknowledgement is **plagiarism** and can incur serious penalties. If it is ever necessary to use someone else's words for a phrase or sentence, they should be placed in quotation marks and acknowledged at the end of the sentence. If you use or modify a diagram or figure from another author, that must be acknowledged underneath (e.g. Figure 3 from Brown *et al*, 1995; figure modified from Green, 1997). Lecturers want to read your own words and ideas.

