



The University of Southern Queensland

## Course specification

### Description: Cell Biology

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
BIO	2209	50821	1, 2006	ONC	1.00	Toowoomba

<b>Academic group:</b>	FOSCI
<b>Academic org:</b>	FOS002
<b>Student contribution band:</b>	2
<b>ASCED code:</b>	010901

### STAFFING

Examiner: Mark Sutherland

Moderator: Grant Daggard

### REQUISITES

Pre-requisite: BIO2103 Co-requisite: BIO2201

### RATIONALE

The course will provide the student with practical and theoretical experience in basic molecular biology and cell biology. Students will gain hands on experience in molecular techniques. During the course students will study the nature of cellular substructure, communication and control of the cell cycle.

### SYNOPSIS

An understanding of the theory and techniques of cell and molecular biology are now becoming essential to many diverse areas of study in biology, ranging from biodiversity and evolutionary relationships to genetic engineering of microbes, plants and animals. Drawing on this knowledge base, the course examines cellular ultra structure, organisation and function and introduces the nature of gene organisation, replication and expression in both prokaryotic and eukaryotic systems. Potential applications of this technology in a number of areas of Biology are discussed. Laboratory sessions introduce a range of fundamental techniques in molecular biology.

### OBJECTIVES

On completion of this course students will be able to:

1. demonstrate an understanding of the current concepts of DNA structure maintenance and repair;
2. explain the basic processes involved in gene replication, transcription and translation in both procaryotic and eucaryotic systems;
3. demonstrate an understanding of basic tools used in recombinant DNA technology including: enzymes, plasmids and techniques for cloning and characterisation;
4. demonstrate the practical use of a range of basic molecular biological techniques;

5. demonstrate a basic understanding of postranslational protein modification;
6. demonstrate an understanding of the cytoskeleton and the structure and function of cell organelles;
7. demonstrate an understanding of cellular communication, cell cycle control mechanisms and apoptosis.

## TOPICS

	Description	Weighting (%)
1.	DNA structure	6.00
2.	Genome organisation in procaryotic and eucaryotic cells	6.00
3.	DNA replication and repair	7.00
4.	Translation	7.00
5.	Gene expression in procaryotes	10.00
6.	Gene expression in eucaryotes	10.00
7.	Recombinant DNA techniques	14.00
8.	Postranslational protein modification	6.00
9.	Protein sorting and targeting	10.00
10.	Intracellular compartmentalisation	8.00
11.	Cellular cytoskeleton	8.00
12.	Cell cycle control and apoptosis	8.00

## TEXT and MATERIALS required to be PURCHASED or ACCESSED

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at <http://bookshop.usq.edu.au> click 'Semester', then enter your 'Course Code' (no spaces).

Alberts, B et al 2004, *Essential cell biology*, 2nd edn, Garland Publishing Inc, New York.

Sutherland, M & Daggard, G 2006, *Cell biology practical notes and exercises*, USQ Publication, Toowoomba.

## REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

Alberts, B et al 2002, *Molecular biology of the cell*, 4th edn, Garrand Publishing Co, (ISBN 0815332181)

Bolsover, SR et al 2004, *Cell biology a short course*, 2nd edn, John Wiley & Sons, New Jersey. (ISBN 0 471 26393 1)

- Brown, TA ed 2000, *Essential molecular biology: a practical approach*, 2nd edn, IRL Press, Oxford, Vol 1&2.
- Brown, TA ed 1991, *Molecular biology labfax*, BIOS, Oxford.
- Karp, G 2005, *Cell and molecular biology*, 4th edn, Wiley, New York.  
(ISBN 0 471 19279 1)
- Nelson, DL & Cox, MM 2005, *Lehninger principles of biochemistry*, 4th edn, Worth Publisher, (ISBN 1 57259 156 6)
- Newton, CR & Graham, A 1994, *PCR: an introduction to biotechniques*, BIOS Scientific Publishers, Oxford.
- Nicholl, D 2002, *Introduction to genetic engineering*, Cambridge University Press, Cambridge.  
(ISBN 0-521- 43054-2HC)
- Sambrook, J, Fritsch, EF & Maniatis, T 1989, *Molecular cloning*, 2nd edn, Cold Spring Harbor Laboratory Press, New York.
- Weissensteiner, T, Griffin, HG & Griffin, A 2003, *PCR technology: current innovations*, CRC Press,  
(0-8493-1184-5)
- Wheater, PR, Burkitt, HG & Daniels, PJ 2000, *Wheater's functional histology*, 4th edn, Churchill Livingstone, Edinburgh.  
(ESBN 0-443-04691)
- Wu, W, Welsh, MJ & Zhang, HH 2003, *Gene biotechnology*, 2nd edn, CRC Press,  
(ISBN 0-8493-1288-4)

## STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Examinations	2.00
Laboratory or Practical Classes	27.00
Lectures	24.00
Private Study	112.00
Test	1.00

## ASSESSMENT DETAILS

Description	Marks out of	Wtg(%)	Due date
PRAC. ASSESSMENTS & PROBLEMS	25.00	25.00	07 Mar 2006 (see note 1)
1 HR MID SEM CLOSED TEST	60.00	25.00	07 Mar 2006 (see note 2)
2 HR CLOSED EXAM	120.00	50.00	END S1 (see note 3)

### NOTES

1. Examiner will advise due dates for practical assessments

2. Examiner will advise details regarding the mid-semester test.
3. Examination dates will be available during the Semester. Please refer to the examination timetable when published.

## **IMPORTANT ASSESSMENT INFORMATION**

- 1 Attendance requirements:  
It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration. To maximize their chances of satisfying the objectives of the practical component of the course, students should attend and actively participate in the laboratory sessions in the course.
- 2 Requirements for students to complete each assessment item satisfactorily:  
To complete the assignment satisfactorily, students must obtain at least 50% of the marks available for the assignment. To complete the examination and test satisfactorily, students must obtain at least 50% of the marks available for the examination and test. To complete the practical component satisfactorily, students must submit all the nominated practical reports and obtain at least 50% of the marks available.
- 3 Penalties for late submission of required work:  
If students submit assignments after the due date without prior approval then a penalty of up to 20% of the total marks available for the assignment will apply for each working day late.
- 4 Requirements for student to be awarded a passing grade in the course:  
To be assured of receiving a passing grade a student must achieve at least 50% of the available weighted marks for the summative assessment items.
- 5 Method used to combine assessment results to attain final grade:  
The final grades for students will be assigned on the basis of the weighted aggregate of the marks (or grades) obtained for each of the summative assessment items in the course.
- 6 Examination information:  
In a Closed Examination, candidates are allowed to bring only writing and drawing instruments into the examination.
- 7 Examination period when Deferred/Supplementary examinations will be held:  
Any Deferred or Supplementary examinations for this course will be held in the fourth week of the semester following this course offering and the examiner will advise students involved in writing of the date time and location of any such examination.
- 8 University Regulations:  
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL <http://www.usq.edu.au/corporateservices/calendar/part5.htm> or in the current USQ Handbook.

## **ASSESSMENT NOTES**

- 9 Students who obtain an overall passing mark, but who do not perform satisfactorily in an examination, may, at the discretion of the Examiner, be granted a supplementary

examination. Students will be granted a deferred examination only if they perform satisfactorily in all other assessment items.

- 10 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if request by the Examiner. Students must retain a copy of each item submitted for assessment. This must be produced within five days if required by the Examiner.
- 11 In order to attend laboratory classes, students must provide and wear appropriate personal protective equipment. This shall include a laboratory coat, closed in shoes, and safety glasses. Such equipment must be approved by supervising staff. Failure to provide and wear the appropriate safety equipment will result in students being excluded from classes.