



The University of Southern Queensland

## Course specification

This version produced 20 Dec 2007.

The current and official versions of the course specifications are available on the web at  
<<http://www.usq.edu.au/coursespecification/current>>.

Please consult the web for updates that may occur during the year.

### Description: Biology 1

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
BIO	1101	62219	1, 2007	EXT	1.00	Toowoomba

<b>Academic group:</b>	FOSCI
<b>Academic org:</b>	FOS002
<b>Student contribution band:</b>	2
<b>ASCED code:</b>	010999

### STAFFING

Examiner: John Dearnaley

Moderator: Andrew Le Brocque

### RATIONALE

This course aims at providing students with a basic grounding in the fundamental concepts of biology and the application of scientific method in solving problems. It provides a theoretical and practical foundation for science and non-science students.

### SYNOPSIS

This course provides a brief history to life on earth, introduces the characteristics and diversity of organisms and provides a comprehensive foundation in cell structure and function, introductory genetics, energy transformations (photosynthesis and respiration), the evolution and classification of plants, introduction to morphology, anatomy and physiology of flowering plants, principles of ecology and an introduction to the evolution of animals and the tissue and organ systems of animals. The scientific method is used to design, perform and interpret the results of experiments in biology. The residential school is a compulsory component of the external offering of this course.

### OBJECTIVES

On completion of this course students will be able to:

1. outline the principles of biological classification and binomial nomenclature (Mid Semester Test);
2. demonstrate an understanding of the evolutionary history of life on earth (Mid Semester Test);
3. examine and describe the structure and function of cells and their organelles (Mid Semester Test, Practical Report 1);
4. describe the structure of cell membranes and outline the principles governing dialysis, osmosis and membrane transport systems (Mid Semester Test, Practical Report 1);
5. demonstrate an understanding of cell reproduction, DNA structure and protein synthesis and basic Mendelian genetics (Mid Semester Test);

6. discuss the laws governing energy transformations and the role of enzymes in biological systems (End Semester Exam);
7. outline the processes of photosynthesis, glycolysis, aerobic and anaerobic respiration (End Semester Exam, Practical Report 2);
8. outline the evolution of plants and identify the basic characteristics of some major plant groups (End Semester Exam);
9. demonstrate familiarity with the basic anatomy, morphology and physiology of flowering plants (End Semester Exam);
10. outline the evolution and diversity of animals (End Semester Exam);
11. differentiate between the main groups of vertebrates and invertebrates and classify organisms into these groups (End Semester Exam);
12. describe basic animal structure in terms of tissues and organ systems (End Semester Exam);
13. outline the ways in which animals acquire nutrients and describe the structure and function of organs associated with this process (End Semester Exam);
14. give an overview of ecological principles and processes at the ecosystem level (End Semester Exam);
15. demonstrate appreciation of the impact of humans and their activities on the environment (End Semester Exam);
16. plan, conduct and report simple scientific experiments in biology (Practical Report 1, Report Practical 2).

## TOPICS

	Description	Weighting (%)
1.	Biodiversity and Classification: Unity and diversity of life: biological organization, basic life processes, origins and diversity of life; Classification and Naming Organisms: principles and problems of classification, taxonomic hierarchy, species concept, binomial nomenclature, 5 kingdom system of classification.	16.00
2.	Cell Structure and Function: Cell Structure and Function - An Overview: cell theory, basic cell structure and function, procaryotic and eucaryotic cells, cell organelles; Membrane Structure and Function: basic models of membrane structure, diffusion, osmosis, dialysis, membrane transport: facilitated diffusion, active transport, endocytosis, exocytosis. Meiosis and mitosis, DNA structure: genes to proteins, simple Mendelian genetics.	22.00
3.	Energy Transformations: Metabolism: Ground Rules and Main Principles: laws governing energy transformations, metabolic reactions and pathways, enzymes, coupling and ATP; Energy - Acquiring Metabolism: photosynthesis and chemosynthesis; Energy - Releasing Metabolism: glycolysis, aerobic and anaerobic pathways, energy yields.	14.00
4.	Plants 1: The diversity of plants, plant evolution, lower plants, gymnosperms, angiosperms, angiosperm morphology, angiosperm anatomy, angiosperm physiology.	16.00

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| 5. | Animals I: Overview - invertebrates and the origin of animal diversity, the vertebrate genealogy, an introduction to animal structure and function, animal nutrition. | 16.00 |
| 6. | Introductory Ecology - what is ecology? ecosystem components, flow of energy, biogeochemical cycles, systems ecology, human impact on the environment.                | 16.00 |

### **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).

Laboratory Coat.

Dissection Kit.

Campbell, NA, Reece, JB & Meyers, N 2006, *Biology*, 7th edn, Pearson, Benjamin Cummings, San Francisco, California.

(Australian Version)

Taylor, MR 2005, *Student study guide for Biology*, 7th edn, Benjamin/Cummings, California.

### **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.

Pechenik, JA 2004, *A short guide to writing about Biology*, 5th edn, Pearson Longman, Boston. (ISBN 0 321 15981 0)

### **STUDENT WORKLOAD REQUIREMENTS**

ACTIVITY	HOURS
Assessment	30.00
Directed Study	40.00
Examinations	3.00
Private Study	78.00
Residential Schools	18.00

## ASSESSMENT DETAILS

Description	Marks out of	Wtg(%)	Due date
PRACTICAL REPORT 1	100.00	15.00	13 Apr 2007
PTAOF1HR CLSD THEORY TEST M/C	40.00	15.00	18 Apr 2007
PTBOF1HR CLSD THEORY TEST S/A	20.00	5.00	18 Apr 2007
PRACTICAL REPORT 2	100.00	25.00	18 May 2007
PTAOF2HR CLSD THEORY EXAM M/C	80.00	25.00	END S1 (see note 1)
PTBOF2HR CLSD THEORY EXAM S/A	40.00	15.00	END S1

### NOTES

1. 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 satisfactorily complete an assessment item a student must achieve at least 50% of the marks or a grade of at least C-. Students do not have to satisfactorily complete each assessment item to be awarded a passing grade in this course. Refer to Statement 4 below for the requirements to receive a passing grade in this course.
- 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 10% 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 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 during the next examination period.

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 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.