COURSE OUTLINE

BIO101 Molecular and Cell Biology

School: School of Health - Biomedicine

2027 | Trimester 2

UniSC Sunshine Coast
UniSC Moreton Bay

BLENDED LEARNING

Most of your course is on campus but you may be able to do some components of this course online.

Please go to unisc.edu.au for up to date information on the teaching sessions and campuses where this course is usually offered.

1. What is this course about?

1.1. Description

This course introduces you to core concepts in cell biology, with a focus on molecular biology. You will learn how DNA is structured, replicated, and repaired, along with principles of RNA biology, and how genetic and epigenetic mechanisms influence gene expression, inheritance and disease. You will develop skill in biology laboratory techniques and learn how to analyse and interpret biological data and communicate findings according to scientific conventions. This course provides essential preparation for further studies in biomedical science.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Online learning materials in a recorded format with interactive modules and formative revision quizzes.	2hrs	Week 1	12 times
Tutorial/Workshop 1 – Weekly online sessions allowing you to engage with course academics. You will be guided through revision activities, the development of core skills for application in workshops and laboratory classes, and also work through problems related to theory learnt across the course. There is also 'open' time provided in these sessions for questions regarding all aspects of the course.	1hr	Week 1	12 times
Tutorial/Workshop 2 – Interactive small class workshops with skill development and collaborative learning	3hrs	Week 1	6 times
Laboratory 1 – Science laboratory (wet lab) for collaborative learning and practical skill development.	3hrs	Week 2	6 times

1.3. Course Topics

- Topic 1. DNA structure, replication and maintenance
- Topic 2. Transcription and RNA processing
- Topic 3. Translation and protein targeting
- Topic 4. Experimental design and data analysis in molecular biology
- Topic 5. Gene regulation and epigenetics
- Topic 6. Cell signalling
- Topic 7. Cell cycle and cancer
- Topic 8. Scientific communication in biomedical science
- Topic 9. Molecular basis of inheritance
- Topic 10. Introduction to molecular technologies and gene editing
- Topic 11. Genome structure and evolution

2. What level is this course?

100 Level (Introductory)

Engaging with discipline knowledge and skills at foundational level, broad application of knowledge and skills in familiar contexts and with support. Limited or no prerequisites. Normally, associated with the first full-time study year of an undergraduate program.

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

COURSE LEARNING OUTCOMES On successful completion of this course, you should be able to...	GRADUATE QUALITIES MAPPING Completing these tasks successfully will contribute to you becoming...	PROFESSIONAL STANDARD MAPPING * Australian Institute of Medical and Clinical Scientists
1 Demonstrate foundational knowledge in cells, genes and molecular biology.	Knowledgeable	6.2
2 Apply knowledge of cells, genes and molecular biology to solve problems.	Knowledgeable Problem solving	7.2.1
3 Conduct experiments to collect, analyse and interpret biological data.	Creative and critical thinker Problem solving	1.5, 1.6, 2.1, 2.2
4 Communicate findings from experiments according to scientific conventions.	Creative and critical thinker Communication	10.3.3, 10.4.2
5 Demonstrate competency in skills relevant to the foundational study of cells, genes and molecular biology.	Empowered	6.2, 6.4

* Competencies by Professional Body

CODE	COMPETENCY
AUSTRALIAN INSTITUTE OF MEDICAL AND CLINICAL SCIENTISTS	
1.5	Collection, preparation and analysis of clinical material: Process specimen utilising appropriate techniques
1.6	Collection, preparation and analysis of clinical material: Read and validate results
2.1	Correlation and validation of results of investigations using knowledge of method(s) including analytical principles and clinical information: Assess validity of data/results against possible range of outcomes
2.2	Correlation and validation of results of investigations using knowledge of method(s) including analytical principles and clinical information: Validation of results
6.2	Professional accountability and participation in continuing professional development: Maintain and update scientific/technical knowledge and skills

CODE	COMPETENCY
6.4	Professional accountability and participation in continuing professional development: Recognises own abilities and level of professional competence
7.2.1	Makes independent, professional judgements: Problems are solved using sound judgement based upon knowledge and practical experience.
10.3.3	Evaluate results and the need for further experimental work: Requirements are determined for further experimental work in consultation with collaborators.
10.4.2	Prepare and deliver report: Preparation of verbal and/or written reports or article (including for publication) is undertaken.

5. Am I eligible to enrol in this course?

Refer to the UniSC Glossary of terms for definitions of "pre-requisites, co-requisites and anti-requisites".

5.1. Pre-requisites

Not applicable

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

Not applicable

5.4. Specific assumed prior knowledge and skills (where applicable)

It is recommended that students have some prerequisite knowledge in core mathematics, basic biology and chemistry.

5.5. Microcredential Information

Not applicable

6. How am I going to be assessed?

6.1. Grading Scale

Standard Grading (GRD)

High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL).

6.2. Details of early feedback on progress

This course will provide you with early feedback on your learning of cell and molecular biology topics and scientific skills, This feedback is provided in the form of formative online quizzes and subsequent in class feedback on summative tasks from week 2 onwards.

6.3. Assessment tasks

DELIVERY MODE	TASK NO.	ASSESSMENT PRODUCT	INDIVIDUAL OR GROUP	WEIGHTING %	WHAT IS THE DURATION / LENGTH?	WHEN SHOULD I SUBMIT?	WHERE SHOULD I SUBMIT IT?
All	1	Portfolio	Individual	10%	Multiple elements, approximately 2-3 hours weekly.	Throughout teaching period (refer to Format)	In Class
All	2	Artefact - Technical and Scientific, and Written Piece	Individual	40%	Multiple elements equivalent to approx. 1500 words total	Throughout teaching period (refer to Format)	Online Assignment Submission with plagiarism check and in class
All	3	Quiz/zes	Individual	50%	Task dependent, 30-45 minutes per quiz.	Throughout teaching period (refer to Format)	In Class

All - Assessment Task 1: Preparation and Participation Portfolio

GOAL:	For you to regularly engage in the theoretical and practical components of the course to facilitate your learning and skill development.
PRODUCT:	Portfolio
AUTHORSHIP STATEMENT:	
FORMAT:	This portfolio will involves preparation and participation in labs/workshops across the Trimester, which may include the completion of activities prior to, and within class.
CRITERIA:	

No.		Learning Outcome assessed
1	Participation in workshops and practical classes to learn about cells, genes and molecular biology.	1 2 3
2	Application of cell and molecular biology knowledge to solve problems	2

GENERIC SKILLS:	Communication, Collaboration, Problem solving

All - Assessment Task 2: Experimental and data analysis reports

GOAL:	To link theoretical knowledge in cell and molecular biology with practical application, developing your practical, analytical and communication skills.
PRODUCT:	Artefact - Technical and Scientific, and Written Piece
AUTHORSHIP STATEMENT:	
FORMAT:	Two written reports demonstrating application of experimental design and data analysis skills, to topics 5-7 (due in Week 8) and 9-12 (due in week 12).
CRITERIA:	

No.		Learning Outcome assessed
1	Application of knowledge in cell and molecular biology to solve problems	2
2	Demonstration of practical skills in cell and molecular biology	3 5
3	Presentation and communication of data in a standard scientific format	4

GENERIC SKILLS:	Communication, Problem solving, Applying technologies

All - Assessment Task 3: Checkpoint quizzes

GOAL:	To assess your understanding of, and ability to apply knowledge of cell and molecular biology presented in this course.
PRODUCT:	Quiz/zes
AUTHORSHIP STATEMENT:	
FORMAT:	Limited open-book quizzes consisting of various question types including multiple choice, fill-in-the blank and short answer style questions across both theory and practical elements of the course content. Checkpoint quiz 1 (10%): Covers topics 1-3, due week 4. Checkpoint quiz 2 (20%): Covers topics 4-7, due week 8. Checkpoint quiz 3 (20%): Covers topics 8-11, due week 12. Further details will be provided in Canvas.
CRITERIA:	**No.** / **Learning Outcome assessed** 1 Description of the structure and function of cells, genes and molecular biology. — 1 2 Demonstrate understanding of the connection between cells, genes and molecular biology. — 1 3 Application of knowledge of cell and molecular biology theory to solve problems. — 2
GENERIC SKILLS:	Communication, Problem solving

7. Directed study hours

A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Student workload is calculated at 12.5 learning hours per one unit.

8. What resources do I need to undertake this course?

Please note: Course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Canvas site– Please log in as soon as possible.

8.1. Prescribed text(s) or course reader

You need regular access to the resource(s) below. Many texts are available as ebooks through the Library at no additional cost.

REQUIRED?	AUTHOR	YEAR	TITLE	EDITION	PUBLISHER
Required	Lisa A. Urry,Noel Meyers,Michael Lee Cain,Steven Alexander Wasserman,Peter V. Minorsky,Rebecca B. Orr,Karen Burke da Silva,Ann Parkinson,Lesley Lluka,Prasad Chunduri	0	Campbell Biology	n/a	n/a

8.2. Specific requirements

To successfully complete the UB001 Bachelor of Medical Laboratory Science (Pathology) and meet accreditation requirements of AIMS, UB001 students enrolled in BIO101 are expected to attend and participate in laboratory practical classes, and attendance will be recorded.

You must wear a lab coat, enclosed shoes, and safety glasses during laboratory classes. You must bring your own copy of the BIO101 Workshop and Laboratory Manual to both laboratory and workshop classes. A bound copy of the workbook will be available for purchase from the UniSC MyPrint Shop, or alternatively, you may download a PDF copy from the Canvas course site, print the manual and bind it yourself.

9. How are risks managed in this course?

Risk assessments have been performed for all laboratory classes and a moderate level of health and safety risk exists. Moderate risks are those associated with laboratory work such as working with chemicals and hazardous substances. You will be required to undertake laboratory induction training and it is also your responsibility to review course material, search online, discuss with lecturers and peers and understand the health and safety risks associated with your specific course of study and to familiarise yourself with the University's general health and safety principles by reviewing the online induction training for students, and following the instructions of the University staff

10. What administrative information is relevant to this course?

10.1. Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Canvas, are electronically checked through Turnitin. This software allows for text comparisons to be made between your submitted assessment item and all other work to which Turnitin has access.

10.2. Assessment: Additional Requirements

Eligibility for Supplementary Assessment

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:
(a) The final mark is in the percentage range 47% to 49.4%; and
(b) The course is graded using the Standard Grading scale

10.3. Assessment: Submission penalties

Late submissions may be penalised up to and including the following maximum percentage of the assessment task's identified value, with weekdays and weekends included in the calculation of days late:
(a) One day: deduct 5%;
(b) Two days: deduct 10%;
(c) Three days: deduct 20%;
(d) Four days: deduct 40%;
(e) Five days: deduct 60%;
(f) Six days: deduct 80%;
(g) Seven days: A result of zero is awarded for the assessment task.

The following penalties will apply for a late submission for an online examination:
Less than 15 minutes: No penalty
From 15 minutes to 30 minutes: 20% penalty
More than 30 minutes: 100% penalty

10.4. Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Central Examinations
- Deferred Examinations
- Student Conduct
- Students with a Disability

For more information, visit https://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching

10.5. Student Charter

UniSC is committed to excellence in teaching, research and engagement in an environment that is inclusive, inspiring, safe and respectful. The Student Charter sets out what students can expect from the University, and what in turn is expected of students, to achieve these outcomes.

10.6. General Enquiries

For course-specific questions, contact your teaching staff or Course Coordinator.

For other enquiries or to access support, please contact Student Central:

- UniSC Student Central
- UniSC Adelaide Student Central