COURSE OUTLINE

MBT352 Molecular Biotechnology

School: School of Science, Technology and Engineering

2025 | Semester 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

MBT352 been designed to provide students with knowledge of the scientific principles and techniques that underpin molecular biotechnology, and how these techniques are applied using real world examples. Topics covered include manipulation of DNA, cloning DNA into bacteria, plants and animals, expression of recombinant proteins, and modification of genomes. The ethics of molecular biotechnology are also covered.

1.2. How will this course be delivered?

ACTIVITY	HOURS	BEGINNING WEEK	FREQUENCY
BLENDED LEARNING			
Learning materials – Asynchronous learning material	2hrs	Week 1	13 times
Laboratory 1 – Laboratories will be used to demonstrate key concepts in Molecular biotechnology. Each laboratory will be two hours in length. The preferred format for these laboratories is face to face. However COVID-19 restrictions may result in an altered delivery format and schedule.	3hrs	Week 2	6 times
Tutorial/Workshop 1 – Computer based tutorials will be used for students to learn how to design and analyse and utilise bioinformatic data.	2hrs	Week 1	7 times
Tutorial/Workshop 2 – Online live lectorial sessions will be used to reinforce key concepts and applications described in other parts of the course.	1hr	Week 1	2 times

1.3. Course Topics

Major themes that will be covered include:
•genetic manipulation of bacteria, plants and animals, including humans
•protein biotechnology
•medical biotechnology
•plant and animal biotechnology
•ethical and social implications of molecular biotechnology

The laboratory component of the course will equip students will technical and analytical skills used in this discipline. These will include:
•PCR, nucleotide sequencing and analysis
•Protein expression and purification
•Forensic biology
•Molecular diagnostics
•Advanced Microscopy
•Aquacultural biotechnology

2. What level is this course?

300 Level (Graduate)

Demonstrating coherence and breadth or depth of knowledge and skills. Independent application of knowledge and skills in unfamiliar contexts. Meeting professional requirements and AQF descriptors for the degree. May require pre-requisites where discipline specific introductory or developing knowledge or skills is necessary. Normally undertaken in the third or fourth 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 Completing these tasks successfully will contribute to you becoming...
1	Design, describe and critically review strategies for cloning DNA, the production of genetically modified organisms, and expression and purification of recombinant proteins.	Knowledgeable Creative and critical thinker
2	Describe and analyse how molecular biotechnology is applied in different settings, using real world examples.	Knowledgeable Creative and critical thinker
3	Synthesise, discuss and critically analyse ethical and societal issues surrounding biotechnology.	Creative and critical thinker Empowered Ethical
4	Demonstrate practical and analytical skills in relation to laboratory and bioinformatical techniques.	Knowledgeable Creative and critical thinker

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

(LFS252 or BIM202) or enrolled in Biotechnology Minor

5.2. Co-requisites

Not applicable

5.3. Anti-requisites

Not applicable

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

Understanding of basic concepts in molecular biology and biochemistry as taught in prerequisite units

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

You will sit a formative multiple choice exam in week 4. This exam will cover content covered in the course that point. Feedback on the correct answers, with relevance to the final exam, will be provided.

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	Oral	Individual or Group	10%	7-15 min	Refer to Format	In Class
All	2	Report	Individual	50%	3000 words	Week 13	Online Submission
All	3	Examination - Centrally Scheduled	Individual	40%	2 hours	Exam Period	Exam Venue

All - Assessment Task 1: Oral Seminar presentation

GOAL:	Describe how biotechnology is or can be used to address contemporary issue or challenge in science, medicine, agricultural or any other industry.
PRODUCT:	Oral
AUTHORSHIP STATEMENT:	
FORMAT:	You will work as a group or individual to prepare and deliver an oral presentation with accompanying figures to describe how biotechnology is or can be applied to address a current issue or challenge. Detailed instruction for the presentation will be provided in course materials (eg CANVAS). Visual materials will be submitted prior to commencement of oral presentations.
CRITERIA:	**No.** / **Learning Outcome assessed** 1 Mastery of the subject matter presented — 1 2 2 Ability to answer questions that demonstrate a higher order understanding of key concepts covered in the seminar — 1 2 3 3 Oral presentation skills — 1 2 4 Quality and appropriateness of visual aids — 1
GENERIC SKILLS:	Communication, Collaboration, Problem solving, Applying technologies, Information literacy

All - Assessment Task 2: Research proposal

GOAL:	Prepare and submit a research proposal that describes a current issue or problem and the application of biotechnological technique to solve or provide insight or to this issue.
PRODUCT:	Report
AUTHORSHIP STATEMENT:	
FORMAT:	The research proposal will be written as a cohesive 3000 word document, containing the following sections: Project Title, Project Summary, Background. Research Aims. Research Plan, Expected or actual Outcomes, Significance of the Research, Potential limitations and/or alternatives, References. Full details will be provided in course materials.
CRITERIA:	**No.** / **Learning Outcome assessed** 1 Mastery of the subject matter presented — 1 2 2 Ability to interpret, synthesise and present information from multiple sources — 2 3 3 Overall report presentation — 1 2
GENERIC SKILLS:	Communication, Problem solving, Organisation, Applying technologies, Information literacy

All - Assessment Task 3: Final exam

GOAL:	You will demonstrate and apply knowledge, analyse relationships and solve problems in molecular biotechnology
PRODUCT:	Examination - Centrally Scheduled
AUTHORSHIP STATEMENT:	
FORMAT:	Multiple choice, short answer and medium answer format
CRITERIA:	**No.** / **Learning Outcome assessed** 1 Your knowledge and explanation of scientific and biotechnological principles and applications covered in the course — 1 2 4 2 Your ability to apply concepts covered in the course — 1 2 3 3 Your knowledge and capacity to discuss ethical and societal impacts of molecular biotechnology — 3
GENERIC SKILLS:	Problem solving, Applying technologies

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
Recommended	Bernard R. Glick,Cheryl L. Patten	2017	Molecular Biotechnology	Fifth edition	ASM Press

8.2. Specific requirements

Students are required to comply with laboratory safety rules.

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

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying: The final mark is in the percentage range 47% to 49.4% The course is graded using the Standard Grading scale You have not failed an assessment task in the course due to academic misconduct

10.3. Assessment: Submission penalties

Late submission of assessment tasks may be penalised at the following maximum rate (the rates are cumulative): - 5% (of the assessment task's identified value) per day for the first two days from the date identified as the due date for the assessment task. - 10% (of the assessment task's identified value) for the third day - 20% (of the assessment task's identified value) for the fourth day and subsequent days up to and including seven days from the date identified as the due date for the assessment task. - A result of zero is awarded for an assessment task submitted after seven days from the date identified as the due date for the assessment task. Weekdays and weekends are included in the calculation of days late. To request an extension you must contact your course coordinator to negotiate an outcome.

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

In person:

- **UniSC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **UniSC Moreton Bay** - Service Centre, Ground Floor, Foundation Building, Gympie Road, Petrie
- **UniSC SouthBank** - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- **UniSC Gympie** - Student Central, 71 Cartwright Road, Gympie
- **UniSC Fraser Coast** - Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay
- **UniSC Caboolture** - Student Central, Level 1 Building J, Cnr Manley and Tallon Street, Caboolture

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