



# BIOL12106 *Molecular Biology*

## Term 1 - 2017

Profile information current as at 27/04/2024 02:37 am

All details in this unit profile for BIOL12106 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

## General Information

### Overview

This unit focuses on developing an understanding of how genomes are organised, how they function within the cell, how molecular medical treatments can be developed, ways in which we can manipulate genomes and utilise their components for a range of purposes including medical, agricultural, and commercial.

### Details

Career Level: *Undergraduate*

Unit Level: *Level 2*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

### Pre-requisites or Co-requisites

Prerequisites ZOOL11005 Foundation Animal Biology or BIOL11100 Functional Biology or BMSC11003 Introduction to Medical Sciences or BMSC11004 Introduction to Biochemistry or BMSC11005 Foundations of Biochemistry or BMED19010 Macromolecules and Cell Function

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

### Offerings For Term 1 - 2017

- Distance
- Rockhampton

### Attendance Requirements

All on-campus students are expected to attend scheduled classes - in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

### Residential Schools

This unit has a Compulsory Residential School for distance mode students and the details are:

Click here to see your [Residential School Timetable](#).

### Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

## Class and Assessment Overview

### Recommended Student Time Commitment

Each 6-credit Undergraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

### Class Timetable

#### [Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

#### [Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

### Assessment Overview

#### 1. **Written Assessment**

Weighting: 20%

#### 2. **Practical and Written Assessment**

Weighting: 20%

#### 3. **Examination**

Weighting: 60%

### Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

## CQUniversity Policies

**All University policies are available on the [CQUniversity Policy site](#).**

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

## Previous Student Feedback

### Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

#### Feedback from Course Evaluation

##### Feedback

One suggestion was to have a few more links to articles and youtube videos for extra material to support learning objectives each week.

##### Recommendation

The Course Coordinator will aim to include these at the next offering by including a link to additional online material on each set of lecture slides.

##### Action

Links to videos and relevant sites were provided for each week's materials, available from the time of publishing the Moodle site.

## Unit Learning Outcomes

### On successful completion of this unit, you will be able to:

1. Demonstrate a clear understanding of the structure, organisation, utility and isolation of nucleic acids
2. Demonstrate a clear understanding of the principles of gene cloning and sequencing
3. Accurately review and evaluate the strategies associated with the transformation of micro-organisms, plants and animals
4. Demonstrate safe and efficient laboratory skills in molecular biology
5. Demonstrate knowledge on the applications of molecular biology skills to medical molecular biology

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes				
	1	2	3	4	5
1 - Written Assessment - 20%					•
2 - Practical and Written Assessment - 20%	•			•	
3 - Examination - 60%	•	•	•		•

### Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes				
	1	2	3	4	5
1 - Communication	•	•			•



## Textbooks and Resources

### Textbooks

BIOL12106

#### Prescribed

#### Fundamental Molecular Biology

Edition: 2 (2012)

Authors: Allison LA

Wiley

Hoboken , NJ , USA

ISBN: 9781118059814

Binding: Hardcover

[View textbooks at the CQUniversity Bookshop](#)

### IT Resources

**You will need access to the following IT resources:**

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

## Referencing Style

All submissions for this unit must use the referencing style: [Harvard \(author-date\)](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**William Aspden** Unit Coordinator

[w.aspden@cqu.edu.au](mailto:w.aspden@cqu.edu.au)

## Schedule

### Week 1 - 06 Mar 2017

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to molecular biology (Ch1, p1-15)	Online slides & text as indicated	

### Week 2 - 13 Mar 2017

Module/Topic	Chapter	Events and Submissions/Topic
DNA structure (Ch2 p17-31); replication (Ch6 p121-123); PCR (Ch8 p205-206; Ch9 p245)	Online slides & text as indicated	

### Week 3 - 20 Mar 2017

Module/Topic	Chapter	Events and Submissions/Topic
RNA (Ch3 p39-45) transcription/translation (Fig 11.2 p294)	Online slides & text as indicated	

### Week 4 - 27 Mar 2017

Module/Topic	Chapter	Events and Submissions/Topic
Genome organisation (Ch 5 p91-108)	Online slides & text as indicated	

**Week 5 - 03 Apr 2017**

Module/Topic	Chapter	Events and Submissions/Topic
Nucleotide isolation & characterisation, electrophoresis (Ch 8 p215-216)	Online slides & text as indicated	

**Vacation Week - 10 Apr 2017**

Module/Topic	Chapter	Events and Submissions/Topic
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**Week 6 - 17 Apr 2017**

Module/Topic	Chapter	Events and Submissions/Topic
Sequencing DNA (Chap 8 p220-223)	Online slides & text as indicated	

**Week 7 - 24 Apr 2017**

Module/Topic	Chapter	Events and Submissions/Topic
Molecular cloning of DNA (Ch8 p190-199)	Online slides and text as indicated	

**Week 8 - 01 May 2017**

Module/Topic	Chapter	Events and Submissions/Topic
Genetically modified organisms (Ch15 p479-509)	Online slides and text as indicated	<b>Essay</b> Due: Week 8 Friday (5 May 2017) 4:00 pm AEST

**Week 9 - 08 May 2017**

Module/Topic	Chapter	Events and Submissions/Topic
Gene therapies (Ch17 p566-579)	Online slides and text as indicated	

**Week 10 - 15 May 2017**

Module/Topic	Chapter	Events and Submissions/Topic
High throughput analyses (Ch 16 p529-533)	Online slides and text as indicated	

**Week 11 - 22 May 2017**

Module/Topic	Chapter	Events and Submissions/Topic
Epigenetics (Ch 12 Summary, P398-400)	Online slides and text as indicated	

**Week 12 - 29 May 2017**

Module/Topic	Chapter	Events and Submissions/Topic
Human Microbiome Project	Online slides and web searches.	

**Review/Exam Week - 05 Jun 2017**

Module/Topic	Chapter	Events and Submissions/Topic
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**Exam Week - 12 Jun 2017**

Module/Topic	Chapter	Events and Submissions/Topic
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## Term Specific Information

The Residential School is compulsory to attend, for all enrolled students.

## Assessment Tasks

1 Essay

**Assessment Type**

Written Assessment

**Task Description**

**Gene Therapy** seems to be an important area in modern medical research. Choose one clinical area of gene therapy research for your essay and undertake literature searches for information on the developments, status and challenges on your chosen topic. If you wish you may compare the gene therapy approaches with other treatment modalities. You may either cover a broad area in a category (e.g. gene therapy research for cancers) or be more specific in your approach (e.g. gene therapy research for a specific type of cancer).

Using secondary (review articles, text books) and at least **five recent** (last 10 years) **primary** literature articles, investigate and report on this topic.

Length 1000-1500 words (not including reference list ) 12 point, 1 1/2 line spacing.

**Assessment Due Date**

Week 8 Friday (5 May 2017) 4:00 pm AEST

**Return Date to Students**

Week 10 Friday (19 May 2017)

**Weighting**

20%

**Minimum mark or grade**

50% (10/20)

**Assessment Criteria****Assessment criteria**

**Title:** Write a descriptive, scientific title for the essay. Try and give your work a title that is appropriate to what your final work represents. (1 mark)

**Introduction:** A one paragraph lead-in to immediately capture attention and indicate the material you will cover. (2 marks)

**Discussion:** Thorough review of literature on your topic area written in your own words. Logically organised. (10 marks)

**Conclusions:** In one paragraph summarise the status of the research you have reviewed in this area and any future research directions. (2 marks)

**References:** Cite and list all references referred to in your essay. Marks will be awarded for reference quality, citing within the report and listing references correctly at the end of the report. (2 marks)

**Spelling, Grammar, Style:** Accuracy. (3 marks)

**Referencing Style**

- [Harvard \(author-date\)](#)

**Submission**

Online

**Submission Instructions**

via Assessment Block in Course Moodle Site

**Learning Outcomes Assessed**

- Demonstrate knowledge on the applications of molecular biology skills to medical molecular biology

**Graduate Attributes**

- Critical Thinking
- Information Literacy

## 2 Practical Report

**Assessment Type**

Practical and Written Assessment

**Task Description**

Undertake and show Residential School experimental calculations, report experimental results and answer questions provided. Answers to be succinct. Students may submit one such report per pair (2) of students. Clearly label report with student names and student numbers.

**Assessment Due Date**

Submit at the end of the Residential School.

**Return Date to Students**

Week 9 Friday (12 May 2017)

**Weighting**

20%

**Minimum mark or grade**

50% (10/20)

**Assessment Criteria**

Assessment will be based on the accuracy of calculations and correctness of answers to questions.

**Referencing Style**

- [Harvard \(author-date\)](#)

**Submission**

Offline Group

**Submission Instructions**

Hand in at end of Residential School

**Learning Outcomes Assessed**

- Demonstrate a clear understanding of the structure, organisation, utility and isolation of nucleic acids
- Demonstrate safe and efficient laboratory skills in molecular biology

**Graduate Attributes**

- Communication
- Critical Thinking
- Team Work

## Examination

**Outline**

Complete an invigilated examination.

**Date**

During the examination period at a CQUniversity examination centre.

**Weighting**

60%

**Length**

120 minutes

**Exam Conditions**

Closed Book.

**Materials**

Calculator - non-programmable, no text retrieval, silent only

Dictionary - non-electronic, concise, direct translation only (dictionary must not contain any notes or comments).



## Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

### What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

### Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

### Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

### What can you do to act with integrity?



#### Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



#### Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



#### Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem