



# BIOL12107 Genomes, Genetics & Evolution

## Term 3 - 2024

Profile information current as at 13/07/2025 05:28 pm

All details in this unit profile for BIOL12107 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

In this unit, your study will focus on the role of the genome in adaptive change in living organisms, particularly animals. This will help you bring together recent advances in our understanding of the genome and the impact of these on the traditional areas of zoology, particularly those involving evolutionary processes. This unit will provide you with a link between molecular biology and other areas of biology including genetics, evolution, taxonomy, embryology and behaviour. In the latter part of the unit, you will focus on various aspects of human evolution.

#### 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 Any one of the following: BIOH11005 Introductory Anatomy and Physiology BIOL11102 Life Science Laboratory BMSC11002 Human Body Systems 2 BMSC11008 Medical Anatomy and Physiology 2 BMSC11011 Human Anatomy and Physiology 2

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 3 - 2024

- Online

#### 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).

#### 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: 30%

#### 2. **Online Quiz(zes)**

Weighting: 20%

#### 3. **Online Quiz(zes)**

Weighting: 50%

### 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 SUTE Unit Comment Report

**Feedback**

Future pathway information was useful for student's career planning.

**Recommendation**

Make a video about the career pathways related to genetics/genomics.

#### Feedback from SUTE Unit Comment Report

**Feedback**

The Practical Bioinformatics presentation was a well received addition to this unit.

**Recommendation**

Create a video covering the laboratory side of genomics.

#### Feedback from SUTE Unit Comment Report

**Feedback**

More content/examples are required to explain how this unit relates to students studying agriculture.

**Recommendation**

Prepare material covering genomics applications in the veterinarian and agricultural sciences.

## Unit Learning Outcomes

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

1. Use correct terminology to describe genetics, genomes and evolution
2. Discuss the concepts of heritability, mutation, development, Mendelian genetics, extranuclear and multi-allelic inheritance, the Hardy-Weinberg Law and related topics in quantitative genetics
3. Explain the mechanisms of change in the genome including the concepts of genetic disorders adaptation and speciation
4. Discuss behavioral and population genetics, socio-biology and ethics.

## Alignment of Learning Outcomes, Assessment and Graduate Attributes

 N/A Level	 Introductory Level	 Intermediate Level	 Graduate Level	 Professional Level	 Advanced Level
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### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Written Assessment - 30%	•	•	•	•
2 - Online Quiz(zes) - 20%	•			
3 - Online Quiz(zes) - 50%	•	•	•	•

### Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Communication	•	•	•	•
2 - Problem Solving				
3 - Critical Thinking		•		•
4 - Information Literacy	•		•	•
5 - Team Work				
6 - Information Technology Competence		•		
7 - Cross Cultural Competence				•
8 - Ethical practice				•
9 - Social Innovation				
10 - Aboriginal and Torres Strait Islander Cultures				

## Textbooks and Resources

### Textbooks

**There are no required textbooks.**

#### Additional Textbook Information

All information needed to complete this unit with the highest grade is provided on the Moodle page. Most of the lectures follow the structure and content of the Concepts of Genetics, by William S. Klug, Michael Cummings, Charlotte A. Spencer, Michael A. Palladino and Darrell Killian.

### 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 styles below:**

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**Dana Stanley** Unit Coordinator  
[d.stanley@cqu.edu.au](mailto:d.stanley@cqu.edu.au)

## Schedule

### Cells and organelles - 04 Nov 2024

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to cells, organelles and genetics		

### Introduction to genomics - 11 Nov 2024

Module/Topic	Chapter	Events and Submissions/Topic
Mutation, DNA repair and transposition		

### Mendelian genetics - 18 Nov 2024

Module/Topic	Chapter	Events and Submissions/Topic
Mendelian genetics		

### Non-Mendelian inheritance - 25 Nov 2024

Module/Topic	Chapter	Events and Submissions/Topic
Non-Mendelian genetics		

### Chromosomes - 02 Dec 2024

Module/Topic	Chapter	Events and Submissions/Topic
Chromosome mapping, sequencing methodologies		

**Extranuclear inheritance - 09 Dec 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Extranuclear inheritance		

**Multi-omics - 16 Dec 2024**

Module/Topic	Chapter	Events and Submissions/Topic
Microbiota, metagenomics, metabolomics, transcriptomics, metatranscriptomics		

**Vacation Week - 23 Dec 2024**

Module/Topic	Chapter	Events and Submissions/Topic
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**Vacation Week - 30 Dec 2024**

Module/Topic	Chapter	Events and Submissions/Topic
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**Genetics of behaviour; population and sociobiology - 06 Jan 2025**

Module/Topic	Chapter	Events and Submissions/Topic
Genetics of behaviour; population and sociobiology		

**Ethics and genetics - 13 Jan 2025**

Module/Topic	Chapter	Events and Submissions/Topic
Genes meet social science - ethics and genetics		

**Evolutionary and conservation genetics - 20 Jan 2025**

Module/Topic	Chapter	Events and Submissions/Topic
Evolutionary and conservation genetics		<b>Essay on artificial intelligence in genetics</b> Due: Week 10 Monday (20 Jan 2025) 11:45 pm AEST

**Genomics, proteomics and bioinformatics - 27 Jan 2025**

Module/Topic	Chapter	Events and Submissions/Topic
Genomics, proteomics and bioinformatics		

**Current research in genetics - 03 Feb 2025**

Module/Topic	Chapter	Events and Submissions/Topic
Current research in genetics		<b>Multiple Choice Quiz</b> Due: Week 12 Monday (3 Feb 2025) 11:45 pm AEST

**Exam Week - 10 Feb 2025**

Module/Topic	Chapter	Events and Submissions/Topic
		<b>Final Quiz</b> Due: Exam Week Monday (10 Feb 2025) 11:45 pm AEST

## Assessment Tasks

### 1 Essay on artificial intelligence in genetics

**Assessment Type**

Written Assessment

**Task Description**

Write an essay on the future role of artificial intelligence in genetics.

AI is making a big entrance into all aspects of our lives, and it will have a major impact on genetic research, including medical, veterinary, environmental, agricultural, plant, and all other areas of genetic research and application. Start by summarising areas of genetics and the current use of AI, and add your views on how AI can be used to improve them.

Make sure you discuss both sides of the issue, including benefits and possible drawbacks. You can review the general use of AI in all major genetics research and application areas, or pick only one narrow area of your choice. Lectures in multi-omics and bioinformatics will give you many ideas, and a separate video discussing this assessment will be prepared as a guideline. The AI topic does not allow or justify the use of AI in writing this essay! Try to choose an innovative and informative title. The first part of the essay is an Abstract (~200-500 words) where you will summarise the purpose of your essay. Make sure you do not overly rely on online references, although it may be tempting. Cover the topic with peer-reviewed published scientific literature. You have complete freedom in choosing the direction of your essay.

Recommended word length is 2000-3000 words, excluding references.

You will be given an opportunity to email a draft to the unit coordinator for feedback before you submit it. No marks will be given at the feedback stage, but you will get advice on improving your work.

Multiple videos on how to prepare this assignment are available on Moodle. The videos cover every aspect of essay writing, such as what to cover, the structure, referencing, and getting the most out of MS Word in terms of formatting and revisions. Additional support provided during assignment writing is also outlined on Moodle. Zoom sessions can be booked with the unit coordinator to discuss the assignment topic and get additional writing feedback.

As per previous student Moodle feedback, the due date is set later in the term; however, it is advised that you aim to submit this assignment earlier if possible. You will get your marks within approximately two weeks from submission, whenever you choose to submit.

### **Assessment Due Date**

Week 10 Monday (20 Jan 2025) 11:45 pm AEST

Submit the essay before due date.

### **Return Date to Students**

Exam Week Monday (10 Feb 2025)

We will aim to return the marked assessment to students in 2 weeks.

### **Weighting**

30%

### **Minimum mark or grade**

50%

### **Assessment Criteria**

Details of assessment criteria will be provided in week 4 tutorial on Moodle. The criteria will include:

- Quality of the literature discussed (40%)
- Complexity of the content (20%)
- Presentation (20%)
- Clarity of expression (10%)
- Referencing (10%)

Additional details on each assessment criterion and the rubric are available on Moodle.

### **Referencing Style**

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

### **Submission**

Online

### **Submission Instructions**

All submissions must be done in Moodle. Upload MS Word documents only, not PDF.

### **Learning Outcomes Assessed**

- Use correct terminology to describe genetics, genomes and evolution
- Discuss the concepts of heritability, mutation, development, Mendelian genetics, extranuclear and multi-allelic inheritance, the Hardy-Weinberg Law and related topics in quantitative genetics
- Explain the mechanisms of change in the genome including the concepts of genetic disorders adaptation and speciation
- Discuss behavioral and population genetics, socio-biology and ethics.

## **2 Multiple Choice Quiz**

**Assessment Type**

Online Quiz(zes)

**Task Description**

Your second assessment is a 50 questions online multiple-choice quiz.

The questions in the quiz are randomly chosen from the weekly quizzes. You will have ONE practice attempt on each weekly quiz.

An additional practice quiz will be provided one week before the online quiz assessment opens. This practice quiz will have the same 50 mock questions for all students and is intended to prepare you for the quiz timing and structure.

Online Quiz Key Information:

- You will have ONE attempt
- You will have 60 minutes to finish the quiz. This is a bit over 1 minute per question.
- This quiz will be open for one day ONLY. The quiz will be open all day, 03/02/2025 (Monday, Week 12), from 12:05 AM until 11:55 PM.
- You must finish the quiz before the closing time, or all of your entries will be lost when the quiz closes.
- In the absence of an approved extension (through Moodle, with documentary evidence), there will be no late submissions for this assessment.

More information on quizzes will be in the Moodle welcome video.

**Number of Quizzes**

1

**Frequency of Quizzes**

Other

**Assessment Due Date**

Week 12 Monday (3 Feb 2025) 11:45 pm AEST

The quiz will be open all day on Monday of week 12

**Return Date to Students**

The results will be immediately visible to students.

**Weighting**

20%

**Minimum mark or grade**

50%

**Assessment Criteria**

Each correct question will score one mark.

**Referencing Style**

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

**Submission**

Online

**Learning Outcomes Assessed**

- Use correct terminology to describe genetics, genomes and evolution

### 3 Final Quiz

**Assessment Type**

Online Quiz(zes)

**Task Description**

The final assessment will be conducted online as a Moodle Quiz.

A detailed video description of the quiz will be provided on Moodle.

The Assessment 3 Final Quiz will be open all day Monday 10/02/2025. You will have one attempt and 2 hours to complete the quiz.

The quiz structure is divided into 3 sections:

- Section A: The aim of the first section is to assess your understanding of terminology. Your answers here should be short and to the point.
- Section B has two genetic problems. These can be provided in the form of pedigrees, genomes or a problem that



requires critical thinking to provide a solution to a particular genetic issue, like diagnosing a genetic disease for example.

- Section C contains two mini essays where you will be discussing some of the current burning issues in genetics. The essays should be around 500 words in length.

A video with more details on each section will be available on the Assessment tile in Moodle.

Important information:

- **Copying and pasting is not allowed**
- Moodle can detect everything copy-pasted in this quiz, including making hyperlinks visible to the unit coordinator.
- Additionally, your quiz will be placed through TURNITIN, and scores will be taken into account when marking. Excessively relying on online plagiarism will result in Academic Misconduct action.
- There is a clear distinction between the online Multiple Choice Quiz (Assessment 2) and The Final Quiz (Assessment 3), even though they are both given in the form of online quizzes. The Multiple Choice Quiz (Assessment 2) is more terminology-focused and in the form of multiple-choice questions. The Final Quiz will contain genetic problems, pedigrees, and mini-essay questions, which are more complex and require thorough preparation.
- Please note that studying from PowerPoint slides alone is unlikely to get you through the final quiz. PowerPoint slides are a simplified guide through the lecture and cannot cover the complexity of complex genetic concepts described in detail in video lectures.

### Number of Quizzes

1

### Frequency of Quizzes

Other

### Assessment Due Date

Exam Week Monday (10 Feb 2025) 11:45 pm AEST

The final quiz will be open all day Monday 10/02/2025

### Return Date to Students

Marks will be available at Certification of Grades

### Weighting

50%

### Minimum mark or grade

50%

### Assessment Criteria

You are expected to demonstrate a solid knowledge of genetics covered in lectures.

Your answers will be marked on correctness and completeness of answers, however, in section B focused on problem solving, even if your answer is not correct (like solving a pedigree) your logical thinking and approach to problem solving will be awarded some marks.

The detailed walk through quiz video is available on the Assessment tile in Moodle. The video takes you through the mock quiz to present the structure and examples of how different answers are marked for each section of the quiz. This video also aims to help you organise your timing for each section and strategies for achieving maximum marks on the quiz.

### Referencing Style

- [Harvard \(author-date\)](#)
- [American Psychological Association 7th Edition \(APA 7th edition\)](#)

### Submission

Online

### Submission Instructions

Moodle quiz

### Learning Outcomes Assessed

- Use correct terminology to describe genetics, genomes and evolution
- Discuss the concepts of heritability, mutation, development, Mendelian genetics, extranuclear and multi-allelic inheritance, the Hardy-Weinberg Law and related topics in quantitative genetics
- Explain the mechanisms of change in the genome including the concepts of genetic disorders adaptation and

- speciation
- Discuss behavioral and population genetics, socio-biology and ethics.

## 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