



BIOL2110

Genetics

Session 1, In person-scheduled-weekday, North Ryde 2024

School of Natural Sciences

Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	2
<u>General Assessment Information</u>	3
<u>Assessment Tasks</u>	4
<u>Delivery and Resources</u>	7
<u>Unit Schedule</u>	7
<u>Policies and Procedures</u>	8
<u>Changes since First Published</u>	10

Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff

Jessica O'Hare

jessica.ohare@mq.edu.au

Credit points

10

Prerequisites

(BIOL1110 or BIOL115) and ((BIOL1310 or BIOL114) or (BIOL1210 or BIOL108) or (BIOL1610 or BIOL116) or (BIOL1620))

Corequisites

(STAT1170 or STAT170) or (STAT1371 or STAT171) or FOSE1015

Co-badged status

BIOL2110/BIOX2110/BIOL6110

Unit description

Genetics occupies a central role in modern sciences, with profound implications for basic and applied research in biology, medicine and agriculture, as well as for a number of philosophical issues in human affairs. This unit offers a balanced approach to teach introductory principles of genetics. It combines sections on classical, molecular and population genetics presented in an integrative way. The practical sessions offer students the possibility of learning essential techniques and skills in modern molecular genetics.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

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

ULO1: Describe how genetic processes apply to agriculture, human health, society, and the environment

ULO2: Apply numeracy and basic principles of genetics to solve problems and draw conclusions from genetic data

ULO3: Describe routine techniques used to assay genetic variation in populations

ULO4: Demonstrate proficiency in the use of genetic research tools (pipettes, gel

electrophoresis, sequence analysis)

ULO5: Analyse genetic data using some common population genetic software and bioinformatic tools

ULO6: Source, synthesise and critically evaluate information from the literature in written and oral formats

General Assessment Information

Requirements to Pass this Unit

To pass this unit you must:

- Achieve a total mark equal to or greater than 50%, and
- Achieve at least 45% in the final examination

Late Assessment Submission Penalty

All assessments are due by **11:55 pm** on the date specified (except Test and Exam). Please see iLearn for more details.

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark of the task) will be applied for each day a written report or presentation assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. The submission time for all uploaded assessments is **11:55 pm**. A 1-hour grace period will be provided to students who experience a technical concern. For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, please apply for [Special Consideration](#).

Assessments where Late Submissions will be accepted

- Practical Report – YES, Standard Late Penalty applies
- Seminar Poster – YES, Standard Late Penalty applies
- Problem Sets – NO, unless Special Consideration is Granted
- Test – NO, unless Special Consideration is Granted
- Final Exam – NO, unless Special Consideration is Granted

Special Consideration

The [Special Consideration Policy](#) aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable and significantly disruptive, and which may affect their performance in assessment. If you experience circumstances or events that affect your ability to complete the assessments in this unit on time, please inform the

convenor and submit a Special Consideration request through ask.mq.edu.au.

Assessment Tasks

Name	Weighting	Hurdle	Due
Problem Sets	5%	No	Wednesday Weeks 3, 5, 7, 9, 11
Practical Report	25%	No	11/04/2024
Seminar Poster	15%	No	30/04/2024
Test	10%	No	14/05/2024
Final Exam	45%	Yes	Exam Period

Problem Sets

Assessment Type ¹: Problem set

Indicative Time on Task ²: 10 hours

Due: **Wednesday Weeks 3, 5, 7, 9, 11**

Weighting: **5%**

The problem sets are designed to assist you to understand topics covered in the course and to provide you with feedback on your understanding of those topics. It is essential that you complete the problem sets as the test and the final examination will cover similar topics to the problems. Answers to the problem sets will be provided. A good and reasonable attempt at each of the problem sets is required to obtain the full marks for each problem set (problems will not be individually graded).

On successful completion you will be able to:

- Apply numeracy and basic principles of genetics to solve problems and draw conclusions from genetic data
- Analyse genetic data using some common population genetic software and bioinformatic tools

Practical Report

Assessment Type ¹: Report

Indicative Time on Task ²: 20 hours

Due: **11/04/2024**

Weighting: **25%**

A major component of this unit is the preparation of a practical report. This practical report should be presented in the style of a scientific publication and describe the procedures and results from the first two practical sessions. It is recommended that you start drafting your report at the commencement of the first practical session. In these practical sessions you will learn essential skills, including: how to isolate DNA, visualize DNA using gel electrophoresis, perform PCR amplification, and sequence a mitochondrial gene. You will learn to identify unknown DNA samples by comparing their sequences with those available in DNA sequence databases. After this, you will align all the DNA sequences collected and build a phylogenetic tree as a complementary method for species identification. Your report will include the activities undertaken within Practicals 1 and 2 within a scientific paper format, with Introduction, Methods, Results and Discussion.

On successful completion you will be able to:

- Describe how genetic processes apply to agriculture, human health, society, and the environment
- Demonstrate proficiency in the use of genetic research tools (pipettes, gel electrophoresis, sequence analysis)
- Analyse genetic data using some common population genetic software and bioinformatic tools
- Source, synthesise and critically evaluate information from the literature in written and oral formats

Seminar Poster

Assessment Type ¹: Presentation

Indicative Time on Task ²: 10 hours

Due: **30/04/2024**

Weighting: **15%**

You are required to design and present a 3-minute scientific conference poster (design as a powerpoint slide with recorded presentation) on **a topic in genetics** that you find exciting, based on a peer-reviewed scientific paper. The grade of your poster assessment will be based on content and presentation and involves peer evaluation.

On successful completion you will be able to:

- Describe how genetic processes apply to agriculture, human health, society, and the environment
- Describe routine techniques used to assay genetic variation in populations

- Source, synthesise and critically evaluate information from the literature in written and oral formats

Test

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 10 hours

Due: **14/05/2024**

Weighting: **10%**

Your progress during the unit will be assessed with a test that will focus on topics covered during the lectures and practical sessions. This test will require application of genetic principles to solve problems and an ability to describe genetic processes and techniques.

On successful completion you will be able to:

- Describe how genetic processes apply to agriculture, human health, society, and the environment
- Apply numeracy and basic principles of genetics to solve problems and draw conclusions from genetic data
- Describe routine techniques used to assay genetic variation in populations

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 25 hours

Due: **Exam Period**

Weighting: **45%**

This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)

Students will be tested on their knowledge of course content. The exam will include information from lectures, practical classes and assessment tasks up to and including week 13. The date for your final exam will be available later in the semester.

On successful completion you will be able to:

- Describe how genetic processes apply to agriculture, human health, society, and the environment
- Apply numeracy and basic principles of genetics to solve problems and draw conclusions

from genetic data

- Describe routine techniques used to assay genetic variation in populations

¹ If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the [Writing Centre](#) for academic skills support.

² Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Week 1 Classes

Lectures will commence in Week 1. These lectures (1 & 2) will be delivered **live online** at the scheduled time, and the recording will be provided. There are no practical classes in Week 1. Please see iLearn for more details of the class and lecture schedule.

Methods of Communication

We will communicate with you via your university email and through announcements on iLearn. Queries to the convenor can be sent to genetics.biol2110@mq.edu.au. Queries that may be relevant to other students can be placed on the iLearn discussion board.

COVID Information

For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie website: <https://www.mq.edu.au/about/coronavirus-faqs>. Remember to check this page regularly in case the information and requirements change during semester. If there are any changes to this unit in relation to COVID, these will be communicated via iLearn.

Unit Schedule

Practical classes will be delivered as a two-part series, based on the required resources for class activities.

- Practical Series 1 - Weeks 2 and 3: These are wet-lab classes, scheduled in a laboratory space.
- Practical Series 2 - Week 4 onwards: These are computer-based classes, held in a computer space.

These Practical Series will be presented separately in your timetable, so please enrol in one

class per series.

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- [Academic Appeals Policy](#)
- [Academic Integrity Policy](#)
- [Academic Progression Policy](#)
- [Assessment Policy](#)
- [Fitness to Practice Procedure](#)
- [Assessment Procedure](#)
- [Complaints Resolution Procedure for Students and Members of the Public](#)
- [Special Consideration Policy](#)

Students seeking more policy resources can visit [Student Policies \(https://students.mq.edu.au/support/study/policies\)](https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit [Policy Central \(https://policies.mq.edu.au\)](https://policies.mq.edu.au) and use the [search tool](#).

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: <https://students.mq.edu.au/admin/other-resources/student-conduct>

Results

Results published on platform other than [eStudent](#), (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe [academic integrity](#) – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free [online writing and maths support](#), [academic skills development](#) and [wellbeing consultations](#).

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

The Writing Centre

The [Writing Centre](#) provides resources to develop your English language proficiency, academic writing, and communication skills.

- [Workshops](#)
- [Chat with a WriteWISE peer writing leader](#)
- [Access StudyWISE](#)
- [Upload an assignment to Studiosity](#)
- [Complete the Academic Integrity Module](#)

The Library provides online and face to face support to help you find and use relevant information resources.

- [Subject and Research Guides](#)
- [Ask a Librarian](#)

Student Services and Support

Macquarie University offers a range of [Student Support Services](#) including:

- [IT Support](#)
- [Accessibility and disability support](#) with study
- Mental health [support](#)
- [Safety support](#) to respond to bullying, harassment, sexual harassment and sexual assault
- [Social support including information about finances, tenancy and legal issues](#)
- [Student Advocacy](#) provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via [AskMQ](#), or contact [Service Connect](#).

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

Changes since First Published

Date	Description
04/02/2024	Updated hurdle information

Unit information based on version 2024.01R of the [Handbook](#)