



BIOX1110

Genes to Organisms

Session 2, In person-scheduled-infrequent, North Ryde 2022

School of Natural Sciences

Contents

<u>General Information</u>	2
<u>Learning Outcomes</u>	3
<u>General Assessment Information</u>	3
<u>Assessment Tasks</u>	3
<u>Delivery and Resources</u>	6
<u>Unit Schedule</u>	8
<u>Policies and Procedures</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

Unit convener

Jaco Le Roux

biol1110@mq.edu.au

Unit co-convener

Oliver Griffith

biol1110@mq.edu.au

Unit administrator

Jessica O'Hare

biol1110@mq.edu.au

Credit points

10

Prerequisites

Corequisites

Co-badged status

Unit description

This unit deals with the nuts and bolts of life on earth. Throughout the unit there is a single unifying theme – that all of the processes that give rise to life are derived from DNA. We show students that DNA controls life by acting as a blueprint for the construction of proteins, and that those proteins build cells which act as the basic structural and functional units of all life. To demonstrate these processes to students, we start by talking about the structure and function of DNA to show how it can act as a simple code for the construction of proteins. Students are then shown how proteins are constructed from the DNA code, and how those proteins can be used to build and maintain cells. Having established these basic principles, the unit then goes on to explain how cells construct multicellular organisms during development, and how the proper functioning of those organisms is maintained by regulating cellular activity. We also demonstrate that the DNA code is essentially immortal because it can be copied from generation to generation, from cell to cell. This unit requires attendance at an on-campus session.

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: Define how biological information is encoded in the structure of the genetic molecule, DNA

ULO2: Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks

ULO3: Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles

ULO4: Describe how genetic information is transmitted through the generations, and the evolutionary process

ULO5: Discuss modern applications of genetics and genomics

ULO6: Analyse scientific data and use the basic elements of scientific writing to write reports

General Assessment Information

Late Assessment Submission Penalty

From 1 July 2022, Students enrolled in Session based units with written assessments will have the following university standard late penalty applied. Please see <https://students.mq.edu.au/study/assessment-exams/assessments> for more information.

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark) will be applied each day a written 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. Submission time for all written assessments is set at **11:55 pm**. A 1-hour grace period is 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, students need to submit an application for [Special Consideration](#).

Assessments where Late Submissions will be accepted

In this unit, late submissions will accepted as follows:

- All assessments - YES, Standard Late Penalty applies

Assessment Tasks

Name	Weighting	Hurdle	Due
Mid-semester test	15%	No	Week 7

Name	Weighting	Hurdle	Due
Database project	10%	No	Sep 5, Oct 17, Nov 7 2022 (@5pm on all due dates)
Practical quizzes	10%	No	Weekly (Mondays @12pm)
Final Exam	40%	No	Formal exam period (exact date TBA)
Paper dissection	25%	No	03/10/2022

Mid-semester test

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 13 hours

Due: **Week 7**

Weighting: **15%**

The mid-semester test will consist of multiple choice questions covering all lecture material discussed to that point. The test will be conducted online under timed conditions.

On successful completion you will be able to:

- Define how biological information is encoded in the structure of the genetic molecule, DNA
- Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- Describe how genetic information is transmitted through the generations, and the evolutionary process

Database project

Assessment Type ¹: Report

Indicative Time on Task ²: 13 hours

Due: **Sep 5, Oct 17, Nov 7 2022 (@5pm on all due dates)**

Weighting: **10%**

The PeerWise database will be available to students throughout the Session. Students must write and submit questions based upon lecture content, and answer questions of other students.

On successful completion you will be able to:

- Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- Describe how genetic information is transmitted through the generations, and the evolutionary process
- Discuss modern applications of genetics and genomics
- Analyse scientific data and use the basic elements of scientific writing to write reports

Practical quizzes

Assessment Type ¹: Quiz/Test

Indicative Time on Task ²: 10 hours

Due: **Weekly (Mondays @12pm)**

Weighting: **10%**

Pre-prac quizzes to test preparedness and comprehension.

On successful completion you will be able to:

- Define how biological information is encoded in the structure of the genetic molecule, DNA
- Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- Describe how genetic information is transmitted through the generations, and the evolutionary process

Final Exam

Assessment Type ¹: Examination

Indicative Time on Task ²: 40 hours

Due: **Formal exam period (exact date TBA)**

Weighting: **40%**

Assesses all material covered in practicals as well as the material in all lectures. Attendance at an invigilated exam is required.

On successful completion you will be able to:

- Define how biological information is encoded in the structure of the genetic molecule, DNA
- Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- Describe how genetic information is transmitted through the generations, and the evolutionary process
- Discuss modern applications of genetics and genomics

Paper dissection

Assessment Type ¹: Report

Indicative Time on Task ²: 25 hours

Due: **03/10/2022**

Weighting: **25%**

A library of at least 10 public research papers will be made available to students. Students must select one paper (or choose a paper in which they are interested, with the approval of the convenors) and analyse the structure, underlying research, and implications of the paper, following the set of questions provided.

On successful completion you will be able to:

- Discuss modern applications of genetics and genomics
- Analyse scientific data and use the basic elements of scientific writing to write reports

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

Lectures

Two 1-hour online lecture recordings per week (starting in week 1). Recordings will be guided online learning H5P modules. The class timetable for this unit can be found through the [Timetable](#) portal. The two tabled slots for weekly lectures will be used for Zoom Q&A and discussion sessions (optional attendance starting in week 2; you must listen to the lecture recordings from the previous week before attending the Zoom session)).

Practicals

There are nine practicals in this unit (see table below). All practicals will be delivered in face-to-face mode. To check the availability of practicals for your unit, please go to timetable viewer, before enrolling in eStudent. To check detailed information on unit assessments, visit the unit iLearn site.

How to find the answers

1. Read the unit outline
2. Consult iLearn (often the majority of questions have already been asked)
3. All questions on lecture content should be posted on the iLearn forum. We will be monitoring the iLearn forum and ensuring all questions are correctly answered. If the answer to any course-related question will benefit the many please post it on iLearn.
4. Please email biol1110@mq.edu.au if you have any questions about:
 1. organising alternative times for assessments or extensions
 2. withdrawal from the unit
 3. personal issues affecting your study
 4. assignment dates
 5. practical class allocations
 6. mark queries
5. Please only approach Tutors with questions throughout practical sessions
6. Please only approach Lab technicians during practical classes and only with technical questions
7. Unexpected adjustments made during the course will be announced via iLearn announcements so make sure you check iLearn regularly.

iLearn

The primary means of communication for this unit is via iLearn™ and email (biol1110@mq.edu.au). iLearn is a web-based computer-mediated communication package and can be accessed by most web browsers from inside or outside the University.

We expect you to use iLearn for:

- Regularly checking subject announcements (at least twice per week)
- Discussing the unit and its content with staff and other students
- Downloading Lecture and Practical materials
- Downloading reference materials

Logging in to iLearn

The URL for the iLearn login page is: <https://ilearn.mq.edu.au/>

You will need to log in to iLearn each time you use it. Your user name is your student number. If you are having trouble accessing your online unit due to a disability or health condition, please visit the Student Services Website <https://students.mq.edu.au/support/personal> or information on how to get assistance. If you are having problems logging on after ensuring you have entered your username and password correctly, you should contact Student IT Help, http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

TEXTBOOK - CAMPBELL BIOLOGY ELEVENTH EDITION (ANZ)

This textbook is available in hard copy from the Co-op Bookshop (ISBN 9781488626241), or electronically at <http://www.pearson.com.au>.

Unit Schedule

Lectures

Week of Session	Dates	Lectures (Online - H5P modules)
1	25 - 31 Jul	Lecture 1: Introduction
		Lecture 2: The scientific method
2	1 - 7 Aug	Lecture 3: DNA: The molecule of heredity
		Lecture 4: DNA replication
3	8 - 14 Aug	Lecture 5: Genes & Genomes
		Lecture 6: Transcription
4	15 - 21 Aug	Lecture 7: Translation
		Lecture 8: Proteins
5	22 - 28 Aug	Lecture 9: Gene regulation
		Lecture 10: Chromosomes
6	29 Aug - 4 Sep	Lecture 11: The cell

		Lecture 12: Mitosis
7	5 - 11 Sep	Lecture 13: Meiosis
	12 - 18 Sep	Mid-semester break
	19- 25 Sep	Mid-semester break
8	26 Sep - 2 Oct	Lecture 14: Mendelian genetics I
		Lecture 15: Mendelian genetics II
9	3 - 9 Oct	Lecture 16: Molecular evolution
		Lecture 17: Population genetics
10	10 - 16 Oct	Lecture 18: Genetic tools
		Lecture 19: Biological membranes
11	17 - 23 Oct	Lecture 20: Cell signalling
		Lecture 21: Prokaryotes
12	24 Oct - 30 Oct	Lecture 22: Revision
13	31 - 6 Nov	Q&A zoom session (No lectures or practicals)
14	7 - 13 Nov	No class - final exam

Practicals

Prac number/block session/date	Practical topic
1 - BLOCK1 (20/08/2022)	The Cellular Basis of Life
2 - BLOCK1 (20/08/2022)	DNA
3 - BLOCK2 (21/08/2022)	Transcription & Translation
4 - BLOCK1 (20/08/2022)	Flagella Regeneration
5 - BLOCK3 (20/09/2022)	Protein Quantification

6 - BLOCK4 (21/09/2022)	Gene Expression - Lac operon
7 - BLOCK4 (21/09/2022)	Phylogeny & Bioinformatics
8 - BLOCK3 (20/09/2022)	Mitosis
9 - BLOCK4 (21/09/2022)	Meiosis & Population Genetics

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 an](#)

[d 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 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.