BIOL1110
Genes to Organisms
Session 2, Infrequent attendance, North Ryde 2021

Department of Biological Sciences

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Session 2 Learning and Teaching Update
The decision has been made to conduct study online for the remainder of Session 2 for all units WITHOUT mandatory on-campus learning activities. Exams for Session 2 will also be online where possible to do so.

This is due to the extension of the lockdown orders and to provide certainty around arrangements for the remainder of Session 2. We hope to return to campus beyond Session 2 as soon as it is safe and appropriate to do so.

Some classes/teaching activities cannot be moved online and must be taught on campus. You should already know if you are in one of these classes/teaching activities and your unit convenor will provide you with more information via iLearn. If you want to confirm, see the list of units with mandatory on-campus classes/teaching activities.

Visit the MQ COVID-19 information page for more detail.
General Information

Unit convenor and teaching staff
Convener
Jaco Le Roux
biol1110@mq.edu.au

Lecturer
Oliver Griffith
biol1110@mq.edu.au

Administration
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.

Important Academic Dates
Information about important academic dates including deadlines for withdrawing from units are available at https://students.mq.edu.au/important-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

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Hurdle</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-semester test</td>
<td>15%</td>
<td>No</td>
<td>10/09/2021</td>
</tr>
<tr>
<td>Paper dissection</td>
<td>25%</td>
<td>No</td>
<td>03/10/2021</td>
</tr>
<tr>
<td>Practical quizzes</td>
<td>10%</td>
<td>No</td>
<td>Weekly (on Monday @ 12pm)</td>
</tr>
<tr>
<td>Database project</td>
<td>10%</td>
<td>No</td>
<td>Sep 5, Oct 17, Nov 7 2021</td>
</tr>
<tr>
<td>Final exam</td>
<td>40%</td>
<td>No</td>
<td>Formal exam period (exact date TBA)</td>
</tr>
</tbody>
</table>

Mid-semester test

Assessment Type: 1: Quiz/Test
Indicative Time on Task: 2: 13 hours
Due: 10/09/2021
Weighting: 15%

The mid-semester test will consist of multiple choice questions covering all lecture material up 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.

Paper dissection
Assessment Type 1: Report
Indicative Time on Task 2: 25 hours
Due: 03/10/2021
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

Practical quizzes
Assessment Type 1: Quiz/Test
Indicative Time on Task 2: 10 hours
Due: Weekly (on Monday @ 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

Database project
Assessment Type: Report
Indicative Time on Task: 13 hours
Due: Sep 5, Oct 17, Nov 7 2021
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

Final exam
Assessment Type: Examination
Indicative Time on Task: 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. This exam will be invigilated and held during the Formal Examination Period.

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

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 Learning Skills Unit 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**

(1) Two 1-hour online lecture recordings per week (starting in week 1)

(2) Mondays 11am-12pm: live Zoom lecture Q&A session (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. In Session 2 2021 our units will run face-to-face block sessions for practicals, while keeping an online version available for those students who choose to continue their studies online.

To check detailed information on unit assessments, visit the unit iLearn site.
**Unit Schedule**

<table>
<thead>
<tr>
<th>Week of Session</th>
<th>Dates</th>
<th>Lectures (Online - recording)</th>
<th>Lecturer</th>
<th>Zoom Question Session (Online - live on Monday)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26 - 30 Jul</td>
<td>Lecture 1: Introduction</td>
<td>Jaco Le Roux</td>
<td>Jaco Le Roux</td>
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<tr>
<td></td>
<td></td>
<td>Lecture 2: The scientific method</td>
<td>Oliver Griffith</td>
<td>Oliver Griffith</td>
</tr>
<tr>
<td>2</td>
<td>2 - 8 Aug</td>
<td>Lecture 3: DNA: The molecule of heredity</td>
<td>Kerstin Bilgmann</td>
<td>Jaco Le Roux</td>
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<tr>
<td></td>
<td></td>
<td>Lecture 4: DNA replication</td>
<td>Kerstin Bilgmann</td>
<td>Jaco Le Roux</td>
</tr>
<tr>
<td>3</td>
<td>9 - 15 Aug</td>
<td>Lecture 5: Genes &amp; Genomes</td>
<td>Oliver Griffith</td>
<td>Oliver Griffith</td>
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<tr>
<td></td>
<td></td>
<td>Lecture 6: Transcription</td>
<td>Kerstin Bilgmann</td>
<td>Jaco Le Roux</td>
</tr>
<tr>
<td>4</td>
<td>16 - 22 Aug</td>
<td>Lecture 7: Translation</td>
<td>Kerstin Bilgmann</td>
<td>Jaco Le Roux</td>
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<td></td>
<td></td>
<td>Lecture 8: Proteins</td>
<td>Kerstin Bilgmann</td>
<td>Jaco Le Roux</td>
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<tr>
<td>5</td>
<td>23 - 29 Aug</td>
<td>Lecture 9: Gene regulation</td>
<td>Kerstin Bilgmann</td>
<td>Jaco Le Roux</td>
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<td></td>
<td></td>
<td>Lecture 10: Chromosomes</td>
<td>Kerstin Bilgmann</td>
<td>Jaco Le Roux</td>
</tr>
<tr>
<td>6</td>
<td>30 Aug - 5 Sep</td>
<td>Lecture 11: The cell</td>
<td>Oliver Griffith</td>
<td>Oliver Griffith</td>
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<tr>
<td></td>
<td></td>
<td>Lecture 12: Mitosis</td>
<td>Kerstin Bilgmann</td>
<td>Jaco Le Roux</td>
</tr>
<tr>
<td>7</td>
<td>6 - 12 Sep</td>
<td>Lecture 13: Meiosis</td>
<td>Kerstin Bilgmann</td>
<td>Mid-semester test for internals (Online)</td>
</tr>
<tr>
<td></td>
<td>13 - 19 Sep</td>
<td>Mid-semester break</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>20-26 Sep</td>
<td>Mid-semester break</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Please choose between attending block sessions on campus or online*
<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Lecture/Tutorial</th>
<th>Instructor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>27 Sep - 3 Oct</td>
<td>Lecture 14: Mendelian genetics I</td>
<td>Kerstin Bilgmann, Jaco Le Roux</td>
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<tr>
<td></td>
<td></td>
<td>Lecture 15: Mendelian genetics II</td>
<td>Kerstin Bilgmann, Jaco Le Roux</td>
</tr>
<tr>
<td>9</td>
<td>4 - 10 Oct</td>
<td>Lecture 16: Molecular evolution</td>
<td>Kerstin Bilgmann, Jaco Le Roux</td>
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<tr>
<td></td>
<td></td>
<td>Lecture 17: Population genetics</td>
<td>Kerstin Bilgmann, Jaco Le Roux</td>
</tr>
<tr>
<td>10</td>
<td>11 - 17 Oct</td>
<td>Lecture 18: Genetic tools</td>
<td>Oliver Griffith, Oliver Griffith</td>
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<td></td>
<td>Lecture 19: Biological membranes</td>
<td>Oliver Griffith, Oliver Griffith</td>
</tr>
<tr>
<td>11</td>
<td>19- 24 Oct</td>
<td>Lecture 20: Cell signalling</td>
<td>Oliver Griffith, Oliver Griffith</td>
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<td></td>
<td></td>
<td>Lecture 21: Prokaryotes</td>
<td>Ian Paulsen, Jaco Le Roux</td>
</tr>
<tr>
<td>13</td>
<td>1 - 7 Nov</td>
<td>Q&amp;A zoom session (No lectures or practicals)</td>
<td>Oliver Griffith, Jaco Le Roux</td>
</tr>
<tr>
<td>14</td>
<td>8 - 14 Nov</td>
<td>Final exam</td>
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**Policies and Procedures**

Macquarie University policies and procedures are accessible from [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central). 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
- Grade Appeal Policy
- Complaint Management Procedure for Students and Members of the Public
- **Special Consideration Policy** *(Note: The Special Consideration Policy is effective from 4 December 2017 and replaces the Disruption to Studies Policy.)*

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

If you would like to see all the policies relevant to Learning and Teaching visit [Policy Central](https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policy-central).
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

Student Support

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

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to help you improve your marks and take control of your study.

• Getting help with your assignment
• Workshops
• StudyWise
• 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 Enquiry Service

For all student enquiries, visit Student Connect at ask.mq.edu.au

If you are a Global MBA student contact globalmba.support@mq.edu.au

Equity Support

Students with a disability are encouraged to contact the Disability Service who can provide appropriate help with any issues that arise during their studies.

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.