BIOL115

Genes to Organisms

S2 External 2019

Dept of Biological Sciences

Contents

General Information

Unit convenor and teaching staff
Unit Convenor
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Kate Barry
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Credit points
3

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://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

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

1. Define how biological information is encoded in the structure of the genetic molecule, DNA
2. Explain the flow of biological information in living systems
3. Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
5. Describe how genetic information is transmitted through the generations, and the evolutionary process
6. Discuss modern applications of genetics and genomics
7. Analyse scientific data and use the basic elements of scientific writing to write reports

General Assessment Information

ASSIGNMENT SUBMISSIONS, TURNITIN & PLAGIARISM

This is a paperless unit so no assignments or quizzes will be physically handed in. You will be required to submit all assignments through iLearn via a Turnitin link. Turnitin is an online program that detects plagiarised pieces of work. It compares not only work between students in the current year but also across previous years, across institutions, with all published materials, and the internet. It is an incredibly effective tool. It is a requirement for all assignments in the course

that they be written in your own words. Do not under any circumstances lend your work to another student. If that student plagiarises your work you too will be liable.

The penalties imposed by the University for plagiarism are serious and may include expulsion from the University. ANY evidence of plagiarism WILL be dealt with according to University policy.

Plagiarism involves using the work of another person and presenting it as one's own. A full outline of the Universities policy on plagiarism is found at http://www.mq.edu.au/policy/docs/academic_honesty/policy.html. The website includes a general discussion of plagiarism, definitions, examples drawn from concrete cases, procedures that will be followed by the University in cases of plagiarism, and recommended penalties. Students are expected to familiarise themselves with the website.

EXTENSIONS & PENALTIES

10% will be deducted for each day an assignment is late, including each day of the weekend. If you are unable to submit the assignment by the due date then an extension must be sought before the due date unless this is absolutely impossible. You will be asked to submit a Disruption to studies request via ask.mq.edu.au (see “What to do if you miss...” below).

WHAT TO DO IF YOU MISS AN ASSIGNMENT TASK

Through illness, misfortune, or special events

- Submit request for Special Consideration via ask.mq.edu.au
- You will need to provide documentation for illness. See https://students.mq.edu.au/study/my-study-program/special-consideration for details.
- Inform the first year coordinator (via the biol115@mq.edu.au email address) that you have submitted consideration.
- The first year coordinator will process your Special Consideration request. If approved it is your responsibility to arrange (via the biol115@mq.edu.au email address) to do your assignment at another time.

Through neglect (i.e. forgot or just slack)

- Be honest!
- Contact the first year coordinator (via the biol115@mq.edu.au email address) to plead your case. Email protocol...

1. Be courteous i.e. address the intended reader appropriately and say thank you!
2. We endeavour to reply to emails in a timely fashion, but will only be checking and responding Monday through Friday, during working hours.

WHAT TO DO IF YOU MISS A PRACTICAL CLASS

- If you are sick on the day of your practical but are fine the next day, and there are practicals on, you may attend these practicals to catch up. You must however ensure that the first year coordinator has agreed to this prior to practical attendance. This is your responsibility.

- If you cannot attend any of the weekly sessions, please email the first year coordinator (biol115@mq.edu.au) to organise attendance at an external session or to ask for advice about special consideration.

FINAL EXAM

If you receive special consideration for the final exam, a supplementary exam will be scheduled in the week of December 17-21 2018. By making a special consideration application for the final exam you are declaring yourself available for a resit during the supplementary examination period and will not be eligible for a second special consideration approval based on pre-existing commitments. Please ensure you are familiar with the policy prior to submitting an application. Approved applicants will receive an individual notification one week prior to the exam with the exact date and time of their supplementary examination.

PRAC ATTENDANCE

It is compulsory to attend all practical classes.

UNIT REQUIREMENTS

To pass this unit you must achieve an overall score of 50% or greater and attendance at all prac classes.

Assessment Tasks

Name	Weighting	Hurdle	Due
Practical quizzes	10%	No	Weekly
Database Project	15%	No	Ongoing throughout semester
Mid-semester Test	15%	No	Week 7 (internals) and OCS2 (externals)
Paper Dissection	20%	No	4/10/19 (Friday week 8)

Name	Weighting	Hurdle	Due
Final Exam	40%	No	TBA

Practical quizzes

Due: **Weekly**
Weighting: **10%**

Pre-prac quizzes to test preparedness and comprehension.

On successful completion you will be able to:

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

Database Project

Due: **Ongoing throughout semester**
Weighting: **15%**

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

On successful completion you will be able to:

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

Mid-semester Test

Due: **Week 7 (internals) and OCS2 (externals)**

Weighting: **15%**

The mid-semester test will consist of multiple choice questions covering all lecture material up to and including Lecture 10 and all labs up to and including Lab 3. The test will be conducted under exam conditions, that is, silently and with no communication between students. All written material, programmable calculators, mobile phones or electronic tablets will be required to be set to the side of the exam room.

For internal students, this test will occur during week 7 of semester - an update will be provided closer to the date.

For external students, the test will be held during the two-day on campus session.

On successful completion you will be able to:

- 1. Define how biological information is encoded in the structure of the genetic molecule, DNA
- 2. Explain the flow of biological information in living systems
- 3. Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process

Paper Dissection

Due: **4/10/19 (Friday week 8)**
Weighting: **20%**

A library of public research papers will be made available to students. Students must select one paper and analyse the structure, underlying research, and implications of the paper, following the set of questions provided. The results must be written up in the form of a report.

On successful completion you will be able to:

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

Final Exam

Due: **TBA**
Weighting: **40%**

Assesses all material covered in practicals as well as the material in all lectures.

On successful completion you will be able to:

- 1. Define how biological information is encoded in the structure of the genetic molecule, DNA

- 2. Explain the flow of biological information in living systems
- 3. Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- 4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics

Delivery and Resources

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 biol115@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 technician 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 iLearnTM and email (biol115@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 http://students.mq.edu.au/support/health_and_wellbeing/ for 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/.

RECOMMENDED TEXTBOOK - CAMPBELL BIOLOGY ELEVENTH EDITION (ANZ)

This textbook is used for both BIOL114 and BIOL115. It is available in hard copy from the Co-op Bookshop (ISBN 9781488613715), or electronically at http://www.pearson.com.au.

Unit Schedule

Lectures

Lecture 1	Monday	11am - 12pm	Mason Theatre, 14 Sir Christopher Ondaatje Ave
Lecture 2	Tuesday	1pm - 2pm	Mason Theatre, 14 Sir Christopher Ondaatje Ave

Practicals - 6 Wallys Walk E8C Science Labs

Note that practicals begin in week 2 for internal students.

Monday 13:00 - 16:00

Tuesday 10:00 - 13:00

Tuesday 14:00 - 17:00

Wednesday 10:00 - 13:00

Wednesday 14:00 - 17:00

Thursday 9:00 - 12:00

Note: You only need to attend one practical session per week.

External Practicals

Saturday 24 August 9am - 5pm

Tuesday 17 September 9am - 5pm

Wednesday 18 September 9am - 5pm

Saturday 19 October 9am - 5pm

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.)*

Undergraduate 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/study/getting-started/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 improve your marks and take control of your study.

- Workshops
- StudyWise
- Academic Integrity Module for Students
- Ask a Learning Adviser

Student Services and 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.

Student Enquiries

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

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.

Graduate Capabilities

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcomes

- 4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- 6. Discuss modern applications of genetics and genomics

- 7. Analyse scientific data and use the basic elements of scientific writing to write reports

Assessment tasks

- Database Project
- Mid-semester Test
- Final Exam

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

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

Assessment tasks

- Database Project
- Mid-semester Test
- Final Exam

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcomes

- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where

relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- 1. Define how biological information is encoded in the structure of the genetic molecule, DNA
- 2. Explain the flow of biological information in living systems
- 3. Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- 4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics
- 7. Analyse scientific data and use the basic elements of scientific writing to write reports

Assessment tasks

- Practical quizzes
- Database Project
- Mid-semester Test
- Paper Dissection
- Final Exam

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- 1. Define how biological information is encoded in the structure of the genetic molecule, DNA
- 2. Explain the flow of biological information in living systems
- 3. Describe how large macromolecules, such as nucleic acids and proteins are

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

Assessment tasks

- Practical quizzes
- Database Project
- Mid-semester Test
- Paper Dissection
- Final Exam

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- 3. Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- 4. Explain how eukaryotic cells are constructed, in terms of the structure and functions of organelles
- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics
- 7. Analyse scientific data and use the basic elements of scientific writing to write reports

Assessment tasks

- Practical quizzes
- Database Project
- Mid-semester Test
- Paper Dissection

- Final Exam

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

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

Assessment tasks

- Database Project
- Mid-semester Test
- Paper Dissection
- Final Exam

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcomes

- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcomes

- 5. Describe how genetic information is transmitted through the generations, and the evolutionary process
- 6. Discuss modern applications of genetics and genomics
- 7. Analyse scientific data and use the basic elements of scientific writing to write reports

Changes from Previous Offering

Changes since First Published

Date	Description
15/07/2019	Thursday PM class not running