



# BIOL115

## Genes to Organisms

S2 Day 2016

*Dept of Biological Sciences*

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## General Information

Unit convenor and teaching staff

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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 submission, Turnitin and 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. So do yourself a favour and write your work in your

own words – in fact 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. Do not copy and paste text into your document with the thought you will modify it later – you will forget! Lastly do not leave things to the last moment, as that is when the urge to plagiarise hits you most.

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](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 and penalties

10% will be deducted for each day an assignment is late, including each day of a 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. To support your extension you will be asked to submit a Disruption to studies request via [ask.me.edu.au](http://ask.me.edu.au) (see “What to do if you miss...” below). All applications for extensions of deadlines must be submitted to the course convener [biol115@mq.edu.au](mailto:biol115@mq.edu.au).

#### WHAT TO DO IF YOU MISS AN ASSIGNMENT TASK OR PRACTICAL SESSION

Through:

#### Illness, misfortune, or special events

- Submit request for Disruption to Studies via [ask.mq.edu.au](http://ask.mq.edu.au) (Do not give doctors certificates to lecturers or tutors).
- You will need to provide documentation for illness. You cannot provide a medical certificate to [ask.mq.edu](http://ask.mq.edu) – you must have the doctor complete a Professional Authority form ([www.mq.edu.au/.../Form\\_Disruption%20to%20Studies\\_PAF.pdf](http://www.mq.edu.au/.../Form_Disruption%20to%20Studies_PAF.pdf)). If you do not submit this form with the request, the Disruption to Studies request will be declined by [ask.mq.edu.au](http://ask.mq.edu.au) without ever being sent to the course convener.
- For other situations you must provide a supporting letter explaining the circumstances that led to you missing the practicals ([http://www.mq.edu.au/policy/docs/disruption\\_studies/schedule\\_evidence.html](http://www.mq.edu.au/policy/docs/disruption_studies/schedule_evidence.html)).
- Inform the course convener (via the [biol115@mq.edu.au](mailto:biol115@mq.edu.au) email address) that you have

submitted consideration.

- The course convener will process your Disruption to Studies request. If approved it is your responsibility to arrange with the course convener (via the [biol115@mq.edu.au](mailto:biol115@mq.edu.au) email address) to do your assignment or practical at another time.
- 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 course convenor has agreed to this prior to practical attendance. This is your responsibility.

Neglect (i.e. forgot or just slack)

- Be honest!
  - Contact the course convener (via the [biol115@mq.edu.au](mailto: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.

## Assessment Tasks

Name	Weighting	Due
<a href="#"><u>Practical quizzes</u></a>	20%	Weekly
<a href="#"><u>Mid-semester Test</u></a>	15%	1/09/16 & 2/09/16
<a href="#"><u>Abstract Writing</u></a>	20%	14/10/16
<a href="#"><u>Final Exam</u></a>	45%	TBA

### Practical quizzes

Due: **Weekly**

Weighting: **20%**

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

## Mid-semester Test

Due: **1/09/16 & 2/09/16**

Weighting: **15%**

The mid-semester test will consist of multiple choice and short answer questions covering all lecture material up to and including Lecture 9. 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.

This test will occur in the normal lecture theatre, during lecture hours.

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

## Abstract Writing

Due: **14/10/16**

Weighting: **20%**

Use any resources available to identify a good research question in molecular biology. Some suggestions will be provided, but you are free to choose your own, with approval from a lecturer. Recent journal papers are likely to be more useful than textbooks to identify questions which have not been answered; textbooks can sometimes be out of date. Online resources can be valuable, but check that they are legitimate academic or government sites. There is a lot of

misinformation on the internet.

Write one paragraph describing the problem, and why it is important. Include at least three relevant references.

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: **45%**

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](mailto: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 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 (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/](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/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

## **TEXTBOOK - CAMPBELL BIOLOGY TENTH EDITION ANZ EDITION**

This textbook is compulsory and is used for both Biol114 and Biol115. It is available in hard copy from the Co-op Bookshop (ISBN 9781486007042), or electronically at <http://www.pearson.com.au/9781486012299>. The electronic version is considerably less



expensive.

## Unit Schedule

### Timetable

#### LECTURES

##### *Lecture 1*

Mon 10-11 W5A Price Theatre

Wed 4-5 Repeat W2.4A 2.200 Macquarie Theatre

##### *Lecture 2*

Thurs 9-10 W5A Price Theatre

Fri 8-9 Repeat W2.4A 2.200 Macquarie Theatre

All internal students are expected to attend one repeat of Lecture 1 and one repeat of Lecture 2 each week. All externals must listen to both Lectures each week and attend if and when they can.

#### INTERNAL PRAC SESSIONS

Mon 1-3

Tues 9-11

11-1

2-4

Wed 9-11

11-1

2-4

Thurs 9-11

11-1

Internal students must attend ONLY ONE of the above Practical sessions per week. You must attend the practical group you were allocated at enrolment, and stay in that group! Attendance of practicals is compulsory. Because the beginning of each practical session will cover essential health and safety procedures, late students will not be able to attend their practical for that week. Please note: all students must attend a minimum of 2/3 of practical sessions in order to pass the class.

The practical sessions are held in a teaching laboratory, and as such all students must wear closed-in shoes (e.g. sneakers, boots) to each class. You will not be allowed to enter the room with open shoes (e.g. sandals, thongs). These cannot be supplied to you on the practical day. Students who are late to practical sessions will not be allowed to attend.

#### EXTERNAL PRAC SESSIONS

On-campus session 1 27 August (Sat) 9am - 5pm E8C Pracs 1-3

On-campus session 2 20 - 21 Sep (Tues & Wed) 9am - 5pm E8C Pracs 4 - 7

On-campus session 3 22 Oct (Sat) 9am - 5pm E8C Pracs 8 - 10

External students must attend ALL on-campus sessions!

## Policies and Procedures

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

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

**New Assessment Policy in effect from Session 2 2016** [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html). For more information visit [http://students.mq.edu.au/events/2016/07/19/new\\_assessment\\_policy\\_in\\_place\\_from\\_session\\_2/](http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/)

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of 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/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## Results

Results shown in *iLearn*, 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](http://ask.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](http://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](http://ask.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/](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

- Mid-semester Test
- Abstract Writing
- 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**

- Mid-semester Test
- Abstract Writing
- 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
- Mid-semester Test
- Abstract Writing
- 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
- Mid-semester Test
- Abstract Writing
- 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
- Mid-semester Test
- Abstract Writing
- 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

- Mid-semester Test
- Abstract Writing
- 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

Unit convenors have changed

Practical quizzes have been extended, and will only run before the practical sessions

Practicals have changed from three to two hours in length

Assignments have been modified

Overall breakdown of marks has changed slightly

## Changes since First Published

Date	Description
29/ 07/ 2016	Updated Learning Outcome mapping for mid-semester test
29/ 07/ 2016	Updated contact details, and added Koa Webster as First Year Unit Co-ordinator Removed duplicate texts Updated and clarified the "how to find the answers" section