



# BIOL115

## The Thread of Life

S2 External 2015

*Dept of Biological Sciences*

### Contents

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<a href="#"><u>General Information</u></a>	2
<a href="#"><u>Learning Outcomes</u></a>	3
<a href="#"><u>General Assessment Information</u></a>	3
<a href="#"><u>Assessment Tasks</u></a>	5
<a href="#"><u>Delivery and Resources</u></a>	8
<a href="#"><u>Unit Schedule</u></a>	10
<a href="#"><u>Learning and Teaching Activities</u></a>	11
<a href="#"><u>Policies and Procedures</u></a>	13
<a href="#"><u>Graduate Capabilities</u></a>	15
<a href="#"><u>Changes from Previous Offering</u></a>	18

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Unit Convenor

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E8C245

Thursdays 2-4 pm (no appointment needed)

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Thursdays 2-4 pm (no appointment needed)

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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:

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

Explain how the Central Dogma explains the flow of biological information in living systems

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

Discuss modern applications of genetics and genomics

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 convener 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	Hurdle	Due
<a href="#">Practical Quizzes</a>	10%	No	Weekly
<a href="#">Abstract Writing</a>	5%	No	13 August
<a href="#">Annotated Bibliography</a>	10%	No	10 September
<a href="#">Mid-semester Test</a>	15%	No	4 September
<a href="#">Synthetic Biology Report</a>	10%	No	15 October
<a href="#">Final exam</a>	50%	No	TBA

## Practical Quizzes

Due: **Weekly**

Weighting: **10%**

In-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

- Explain how the Central Dogma explains the flow of biological information in living systems
- 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
- Analyse scientific data and use the basic elements of scientific writing to write reports

## Abstract Writing

Due: **13 August**

Weighting: **5%**

You will be required to produce a 250-word abstract on a scientific publication that will be provided to you. Here, you will have to summarise the content of the paper into a meaningful abstract. In addition, you will have to identify two other peer-reviewed primary-literature publications that are on a similar topic to the paper that you have summarised. This assignment will introduce you to a key element of scientific writing – abstracting. This assignment will assess your ability to state scientific knowledge in your own words, and to use knowledge gained from a scientific paper to seek out further research. The library provides information to assist in researching scientific papers, which will help with both this assignment and the annotated bibliography assessment ([http://www.mq.edu.au/on\\_campus/library/research/researching\\_your\\_assignment/](http://www.mq.edu.au/on_campus/library/research/researching_your_assignment/)).

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

## Annotated Bibliography

Due: **10 September**

Weighting: **10%**

Collect 8 published peer-reviewed scientific articles (i.e. primary literature) on a topic of interest (in the field of cell and molecular biology). All articles must have been published between 2011 and 2015. Then, provide brief description of the main ideas described in those articles. You need to synthesise those ideas into a flow that illustrates the key ideas and developments in the field. A list of topics that you could address in your assignment will be provided later. The library provides information to assist in researching scientific papers, which will help with this assignment and the abstract writing assignment ([http://www.mq.edu.au/on\\_campus/library/research/researching\\_your\\_assignment/](http://www.mq.edu.au/on_campus/library/research/researching_your_assignment/)).

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

## Mid-semester Test

Due: **4 September**

Weighting: **15%**

The mid-semester test will consist of multiple choice and short answer questions covering all lecture material up to and including Lecture 11. 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:

- Define how biological information is encoded in the structure of the genetic molecule, DNA
- Explain how the Central Dogma explains the flow of biological information in living systems
- Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks

## Synthetic Biology Report

Due: **15 October**

Weighting: **10%**

In this exercise you will start to think about the practicalities of designing organisms to carry out functions they have not evolved to do, based on the knowledge of cell function you have gained in this course. You will develop and demonstrate your literature research and reasoning skills, and your ability to write up the results of your research in a scientifically rigorous way.

On successful completion you will be able to:

- Explain how the Central Dogma explains the flow of biological information in living systems
- Describe how genetic information is transmitted
- Discuss modern applications of genetics and genomics
- Analyse scientific data and use the basic elements of scientific writing to write reports

## Final exam

Due: **TBA**

Weighting: **50%**

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

On successful completion you will be able to:

- Define how biological information is encoded in the structure of the genetic molecule, DNA
- Explain how the Central Dogma explains the flow of biological information in living systems
- 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
- Discuss modern applications of genetics and genomics
- Analyse scientific data and use the basic elements of scientific writing to write reports

## **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. Julian, our supertutor, 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. **Lab technician: only during practical classes and only technical questions**
5. **Tutor: questions throughout practical sessions**
6. **Course convener: the majority of other enquiries including assignments, practical class allocations, mark queries and organising alternative times for assessments or extensions, withdrawal, personal issues**
7. **Unexpected adjustments made during the course will announced via 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 – PRINCIPLES OF BIOLOGY, NATURE EDUCATION**

**This textbook is compulsory** and is used for both Biol114 and Biol115. It is accessed at <http://www.nature.com/principles>. There are a number of advantages over alternative textbooks: it is paper-free, much cheaper to buy, has interactive quizzes, and has real scientific literature associated with each chapter. We anticipate this will provide a significant contribution to your learning. Please feel free to provide feedback on this textbook as we progress through the course.

Please note: this is an e-textbook there is no hard copy of the text available.

Registration for *Principles of Biology*:

### **What you will need:**

- Access Code from the Bookstore, or use a Credit Card to purchase from the site as detailed below.

## Registration Steps:

- Please visit: [www.nature.com/principles](http://www.nature.com/principles)
- Under “Getting Started” (on the bottom right), click on “Students”.
- Input the Course Code of: [38753340](#) into the “Search by your course code” box.
- Review the course details (instructor, institution, course) and if it is correct, click on “Yes, take me to this class”.
- If you are planning on using a credit card, click on “Purchase.” You will need to “Register” first which creates a username and password to access the site.
- If you have an access code from the bookstore, click on “Redeem access code.” You will also have to register, but this will be after inputting your access code.

## Once you have registered, here is how you can access your course/text:

- Please visit: [www.nature.com/principles](http://www.nature.com/principles)
- On the upper right navigation, click on “Sign In”
- Input your username and password credentials
- Click on “MyBookshelf”
- Click the link for your text to enter your classroom.

Enjoy!

## Unit Schedule

### Timetable

#### LECTURES

Lecture 1	Monday	11-12 am	Mason Theatre (E7B)
	Tuesday (repeat)	12 noon – 1 pm	Mason Theatre (E7B)
Lecture 2	Friday	<a href="#">2-3 pm</a>	Mason Theatre (E7B)
	Friday (repeat)	3-4 pm	Mason Theatre (E7B)

**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

<a href="#">Monday</a>	<a href="#">1 – 4 pm</a>	E8C Labs 1-3
Tuesday	9 – 12 am	E8C Labs 1-3
Tuesday	2 – 5 pm	E8C Labs 1-3 (note this prac starts later than other afternoon sessions)

Wednesday	9 - 12 am	E8C Labs 1-3
Wednesday	1 – 4 pm	E8C Labs 1-3
Thursday	9 – 12 am	E8C Labs 1-3
Thursday	1 – 4 pm	E8C Labs 1-3
Friday	9 – 12 am	E8C Labs 1-3

**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 80% 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**

<b><u>On-campus session 1</u></b>	<b><u>22 - 23 August</u></b> (Sat & Sun)	<b>9am - 5pm</b>	E8C Labs 1-3
<b>On-campus session 2</b>	<b>14 - 15 September (Tues &amp; Wed)</b>	<b>9am - 5pm</b>	E8C Labs 1-3

**External students must attend ALL on-campus sessions!**

## **Learning and Teaching Activities**

### **Practical Quizzes (10%)**

You'll be asked to keep a Practical Book in which you record all of your notes, diagrams, thoughts and conclusions from practical classes and tutorials. Your practical book will not be assessed, but it will be essential to help you study for the mid-semester test and the final exam. You are expected to wear closed-toed shoes, bring your practical guide (from iLearn), a practical notebook, and writing implements to every practical session. Bringing your lecture notes is likely to help you in the practical. The assessment of practical classes will be based on short online quizzes, via iLearn. At the beginning of each practical session, students will be asked to complete a short online quiz based on the introductory material in the practical guide. Pre-reading the instructions for that day's prac, before the practical session, is required to earn marks on this quiz. Being 5 minutes late to your practical session will cause you to lose these points. At the end of the practical session, students will complete an additional online quiz on the information learned during the practical session. Failure to attend practical classes will be penalised, attendance at 80% of practicals is required to pass the class, and points from quizzes can only be earned if the practical is attended. Attendance at practical 5 is required to complete

assignment 3 – Synthetic Biology.

## Abstract Writing (5%)

You will be required to produce a 250-word abstract on a scientific publication that will be provided to you. Here, you will have to summarise the content of the paper into a meaningful abstract. In addition, you will have to identify two other peer-reviewed primary-literature publications that are on a similar topic to the paper that you have summarised. This assignment will introduce you to a key element of scientific writing – abstracting. This assignment will assess your ability to state scientific knowledge in your own words, and to use knowledge gained from a scientific paper to seek out further research. The library provides information to assist in researching scientific papers, which will help with both this assignment and the annotated bibliography assessment ([http://www.mq.edu.au/on\\_campus/library/research/researching\\_your\\_assignment/](http://www.mq.edu.au/on_campus/library/research/researching_your_assignment/)).

## Annotated Bibliography (10%)

Collect 8 published peer-reviewed scientific articles (i.e. primary literature) on a topic of interest (in the field of cell and molecular biology). All articles must have been published between 2011 and 2015. Then, provide brief description of the main ideas described in those articles. You need to synthesise those ideas into a flow that illustrates the key ideas and developments in the field. A list of topics that you could address in your assignment will be provided later. The library provides information to assist in researching scientific papers, which will help with this assignment and the abstract writing assignment ([http://www.mq.edu.au/on\\_campus/library/research/researching\\_your\\_assignment/](http://www.mq.edu.au/on_campus/library/research/researching_your_assignment/)).

## Mid-semester test (15%)

The mid-semester test will consist of multiple choice and short answer questions covering all lecture material up to and including Lecture 11. The test will take place in the normal lecture time on 4 September. 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.

## Synthetic Biology Report (10%)

In this exercise you will start to think about the practicalities of designing organisms to carry out functions they have not evolved to do, based on the knowledge of cell function you have gained in this course. You will develop and demonstrate your literature research and reasoning skills, and your ability to write up the results of your research in a scientifically rigorous way.

## Final exam (50%)

The final exam is a three-hour exam with a mixture of multiple choice and short answer questions. The exam will cover all Lecture and Practical material presented in the unit. Exam conditions will be as for mid-semester test: silently and with no communication between students. No written material, programmable calculators or mobile phones may be brought into the exam room. Paper language translating dictionaries will be allowed. Notify the convener if this is required. The University will announce the examination date towards the end of semester.

We will relay that date via an announcement in Lectures and iLearn.

## 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)

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

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

Grievance Management Policy [http://mq.edu.au/policy/docs/grievance\\_management/policy.html](http://mq.edu.au/policy/docs/grievance_management/policy.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).

## UNIT COMPLETION REQUIREMENTS

Minimum requirements include:

1. The completion and submission of all three assessment tasks (taking into account officially approved *Disruptions to Study*).
2. Must achieve a final mark of >50% for your total assessment.
3. Must achieve a final mark of >50% for your final exam.
4. Practicals are compulsory.

If a practical is missed through illness or mishap you must submit a *Disruption to Studies* via [ask.mq.edu.au](http://ask.mq.edu.au). You will need to provide a *Professional Authority Form* for illness, or for other situations you must provide a supporting letter explaining the circumstances that has led to you missing the practicals.

Students that miss more than 20% of the practicals (i.e. more than 2) without submission of *Disruption to Studies* through [ask.mq.edu.au](http://ask.mq.edu.au) will be unable to pass the unit.

### Overall grades

The current university grading is: fail (F <50%), pass (P 50%-64%), credit (CR 65%-74%), distinction (D 75%-84%) and high distinction (HD 85%-100%).

## 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 convener 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.

## 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://informatics.mq.edu.au/help/>.

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

## Graduate Capabilities

### 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:

### Assessment tasks

- Practical Quizzes



- Abstract Writing
- Annotated Bibliography
- Mid-semester Test
- Synthetic Biology Report
- Final exam

## 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

- Define how biological information is encoded in the structure of the genetic molecule, DNA
- Explain how the Central Dogma explains the flow of biological information in living systems
- 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
- Discuss modern applications of genetics and genomics

### Assessment tasks

- Practical Quizzes
- Annotated Bibliography
- Mid-semester Test
- Synthetic Biology Report
- 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**

- Define how biological information is encoded in the structure of the genetic molecule, DNA
- Explain how the Central Dogma explains the flow of biological information in living systems
- Describe how large macromolecules, such as nucleic acids and proteins are constructed from simpler building blocks
- Describe how genetic information is transmitted
- Discuss modern applications of genetics and genomics
- Analyse scientific data and use the basic elements of scientific writing to write reports

## **Assessment tasks**

- Practical Quizzes
- Abstract Writing
- Annotated Bibliography
- Mid-semester Test
- Synthetic Biology Report
- 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:

## **Assessment tasks**

- Practical Quizzes
- Annotated Bibliography
- Mid-semester Test
- Synthetic Biology Report
- 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

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

### Assessment tasks

- Abstract Writing
- Synthetic Biology Report

## 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:

### Assessment tasks

- Abstract Writing
- Synthetic Biology Report

## Changes from Previous Offering

Unit convenor has changed.

Learning outcomes have changed.

Assignments have changed.

Lecture content has been revised.