



1. General Course Information

1.1 Course Details

Course Code:	1042SCG
Course Name:	Genetics and Evolutionary Biology
Trimester:	Trimester 3, 2019
Program:	Diploma of Science
	In Person
	Mt Gravatt
Credit Points:	10
Course Coordinator:	Claire Wang
Document modified:	10 September, 2019

Course Description

Genetics and Evolutionary Biology is an introductory course that will provide foundational concepts in molecular genetics and evolutionary biology. Students will understand the process of inheritance and mutation, population genetics, and evolutionary theory at the molecular, organismal and population level. Students will also learn commonly used genetic analysis methods and techniques employed by scientists. Course content will be delivered through a combination of lectures, tutorials, and online material. Incompatible: Functional Molecular Genetics 1006BPS

Rationale

This course will instruct students in the fundamental concepts of inheritance, genetics, evolution and basic molecular techniques that are part of the experimental toolkits for molecular biologists, environmental scientists and evolutionary biologists alike. The course builds on concepts, describing these fundamental processes at the molecular scale right through to whole organismal and population scales. The molecular genetics concepts are also applied to understand the process of evolutionary theories.

Assumed Knowledge

It is assumed that you have the background knowledge equivalence of Australian Grade 12 biology and that you are familiar with the main concepts covered in the course 1041SCG Biological Systems. If this is not the case, you are strongly advised to review the bridging materials and resources provided on the Griffith College student portal course website and contact the Course Convenor for additional support.

1.2 Teaching Team

Your lecturer/tutor can be contacted via the email system on the portal.

Name	Email
Claire Wang	Claire.Wang@staff.griffithcollege.edu.au

1.3 Staff Consultation

Your lecturer/tutor is available each week for consultation outside of normal class times. Times that your lecturer/tutor will be available for consultation will be given in the first week of lectures. A list of times and rooms will be published on the Griffith College Portal under the "Support and Services/Teacher Consultation Times" link.

1.4 Timetable

Your timetable is available on the Griffith College Portal at Class Timetable in Student and Services.

1.5 Technical Specifications

All students must have access to a computer or suitable mobile device.

2. Aims, Outcomes & Generic Skills

2.1 Course Aims

Defining and describing the molecular basis of inheritance and evolution, as well as the information that a gene provides to an individual, is essential to health-care practitioners, evolutionary biologists and environmental scientists.

The course deals with the molecular basis of genetics, genetic inheritance and genetic analysis. It considers chromosomal inheritance, pedigree analysis, DNA mutation and repair, definitions of the gene and recombinant DNA technology. It also applies basic statistical tools to understand the process of population genetics and the forces that can impact genetic diversity in populations and evolution.

2.2 Learning Outcomes

After successfully completing this course you should be able to:

1. Define what a gene is, and the molecular nature of the gene.
2. Describe how gene is inherited, and the evolutionary concepts and process.
3. Explain the regulation of a gene, specifically, its capacity for replication and repair, mutation and expression.
4. Apply theoretical skills in the analysis of genetic material and human disorders including genetic diseases.
5. Evaluate the principles of inheritance and genetic exchange among populations.

2.3 Generic skills

For further details on the Generic Skills please refer to the Graduate Generic Skills and Capabilities policy.

Griffith College aims to develop graduates who have an open and critical approach to learning and a capacity for lifelong learning. Through engagement in their studies, students are provided with opportunities to begin the development of these and other generic skills.

Studies in this course will give you opportunities to begin to develop the following skills:

Generic Skills	Taught	Practised	Assessed
Written Communication	Yes	Yes	Yes
Oral Communication	Yes	Yes	
Information Literacy	Yes	Yes	Yes
Secondary Research	Yes	Yes	Yes
Critical and Innovative Thinking	Yes	Yes	
Academic Integrity	Yes	Yes	Yes
Self Directed Learning	Yes	Yes	Yes
Team Work	Yes	Yes	Yes
Cultural Intelligence	Yes		
English Language Proficiency	Yes	Yes	

3. Learning Resources

3.1 Required Resources

Lisa A. Urry, Noel Meyers, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, Jane B. Reece. (2017). Campbell Biology: Australian and New Zealand edition (11th edition). Pearson.

3.2.3.2 Recommended Resources

1. Benjamin A Pierce. (2014). Genetics: A conceptual approach. New York: W.H. Freeman.
2. D. Peter Snustad; Michael J Simmons. (2015). Principles of Genetics (7th edition). Wiley.

3.3 College Support Services and Learning Resources

The College provides many facilities and support services to assist students in their studies. Links to information about College support resources that are available to students are included below for easy reference.

[Digital Library](#) – Databases to which Griffith College students have access to through the Griffith Library Databases.

MyStudy – there is a dedicated website for this course via MyStudy on the Griffith College Portal.

[Academic Integrity Tutorial](#) - this tutorial helps students to understand what academic integrity is and why it matters. You will be able to identify types of breaches of academic integrity, understand what skills you will need in order to maintain academic integrity, and learn about the processes of referencing styles.

Services and Support provides a range of services to support students throughout their studies including personal support such as Counselling; Academic support; and Welfare support.

Jobs and Employment in the [Student Hub](#) can assist students with career direction, resume and interviewpreparation, job search tips, and more.

[IT Support](#) provides details of accessing support, information on s numbers and internet access and computer lab rules.

3.4 Other Learning Information

Attendance

You are expected to attend all lectures and tutorials and to actively engage in learning during these sessions. You are expected to bring all necessary learning resources to class such as the required textbook and /or Workbook. In addition, you may BYOD (bring your own device) to class such as a laptop or tablet. This is not a requirement as computer lab facilities are available on campus, however, the use of such devices in the classroom is encouraged with appropriate and considerate use principles being a priority.

Preparation and Participation in Class

In order to enhance learning, prepare before lectures and tutorials. Read the relevant section of your text book before a lecture, and for a tutorial read both the textbook and the relevant lecture notes. If you have been given tutorial exercises, make sure you complete them. Active participation in lectures and tutorials will improve your learning. Ask questions when something is unclear or when you want to bring some issue to your lecturer or tutor's attention; respond to questions to test your knowledge and engage in discussion to help yourself and others learn.

Consultation Sessions

Teachers offer extra time each week to assist students outside the classroom. This is known as 'consultation time.' You may seek assistance from your teacher on email or in person according to how the teacher has explained this to the class. Attendance during consultation time is optional but you are encouraged to use this extra help to improve your learning outcomes.

Course Materials

Lecture notes will be made available to you in MyStudy on the Griffith College Portal and you are advised to either print these out and bring them to each class so that extra notes can be added or BYOD (bring your own device) and add extra notes digitally.

Self-Directed Learning

You will be expected to learn independently. This means you must organise and learn the course content even when you are not specifically asked to do so by your lecturer or tutor. This involves revising the weekly course material. It also means you will need to find additional information for some assessment items beyond that given to you in textbooks and lecture notes, and to construct your own response to a question or topic. All of this requires careful planning of your time. Expect to spend, on average, at least 10 hours per week including class time for each of your courses.

Program Progression

You are reminded that satisfactory Program Progression requires that attendance in classes is maintained at equal to or greater than 80%, and that GPA is maintained at equal to or greater than 3.5 [please see Griffith College Policy Library - Program Progression Policy - for more information].

Teacher and course Evaluation

Your feedback is respected and valued by your lecturers and tutors. You are encouraged to provide your thoughts on the course and teaching, both positive and critical, directly to your lecturer and tutor or by completing course and lecturer evaluations via Griffith College's evaluation tool whenever these are available.

4. Learning and Teaching Activities

4.1 Weekly Learning Activities

Week	Topic	Activity	Readings	Learning Outcomes
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1	Module 1: Cellular reproduction and chromosomal basis of inheritance. Review of cell cycle, mitosis and meiosis. Mendelian inheritance, pedigree analysis (theory of chromosome and inheritance patterns). Mechanism of sex	Lecture Tutorial	Textbook : Ch.6, 12, 14 & 15	1,2,5
2	Module 2: Molecular basis of Inheritance and DNA mutations part 1- Central dogma. DNA & Chromosome structure. DNA Replication	Lecture Tutorial	Textbook : Ch.16 & 17	1,2,3
3	Module 2: Molecular basis of Inheritance and DNA mutations part 2a – DNA Transcription and translation, basic features of mutations and phenotypic effects.	Lecture Tutorial	Textbook : Ch. 16 & 17	1,2,3,4
4	Module 2: Molecular basis of Inheritance and DNA mutations part 2b – Molecular basis of Mutations and DNA Recombination and DNA repair.	Lecture Tutorial	Textbook : Ch. 16 & 17	2,3,4,5
5	Module 3: Recombinant DNA Technology part 1 – Vectors (components of vectors and how they should be used). Cloning of DNA. Polymerase chain reaction (PCR).	Lecture Tutorial	Textbook : Ch. 20	3,4,5
6	Module 3: Recombinant DNA Technology part 2: Molecular analysis of DNA, RNA and protein. DNA sequencing. Human genome project. Introduction to genomics	Lecture Tutorial	Textbook : Ch. 20	3,4,5
7	Revision – module 1-2 mid-trimester exam	Mid- trimester exam	Video: “Evolution” - PBS documentary	1,2,3,4,5
8	Module 4: Microevolution/ Population Genetics – Modelling the Hardy Weinberg equilibrium, introduction to the concept of evolutionary biology	Lecture Tutorial	Textbook: Ch. 22 & 23	3,4,5
9	Module 4: Microevolution/ Population Genetics - Allelic variation and Hardy Weinberg equilibrium Genetic diversity and evolution	Lecture Tutorial	Textbook: Ch 23.	1,2,5
10	Module 4: Microevolution/Population Genetics – Genetic diversity and gene flow, genetic drift, mutation and selection.	Lecture Tutorial	Textbook: Ch 23.	2,3,5
11	Module 4: Microevolution/Population genetics – Measuring genetic diversity at the population level. Examples.	Lecture Tutorial	Textbook: Ch 23	2,3,4,5
12	Revision – module 1-4	Lecture Tutorial		1,2,3,4,5

5. Assessment Plan

5.1 Assessment Summary

Item	Assessment Task	Weighting	Learning Outcomes	Due Date
1	Diagnostic quiz	0%	1,2,3	Week 2
2	Online assessment	10%	1,2,3,4,5	Week 3 - 11
3	In-class quizzes (2)	20%	1,2,3,4,5	Week 4 & 11
4	Scientific report	10%	3,4	Week 9
5	Mid-trimester exam	20%	1,2,3,4	Week 7
6	Final exam	40%	1,2,3,4,5	Week 13/14

5.2 Assessment Detail

Diagnostic quiz (0%)

During week 1-2, a short multiple choice quiz (10 questions) will be available on student portal. The quiz will cover general and assumed knowledge essential for successful completion of this course. Students are required to complete the short quiz by the end of week 2 and answers to the quiz will be posted by week 3. The item has 0% weighing and is designed to help students to identify the knowledge and skills they need to improve. After the quiz, students can seek assistance during the scheduled tutorials with lecturer or tutor.

Online assessment (10%)

A self-paced online assignment task will be completed between weeks 3 and 11. The assignment will use a common theme/example to explore various aspects of the material delivered throughout the course. The assignment will help students understand concepts discussed in Module 1 through to 4. The assessment will be completed online via link on student portal.

In-class quizzes (2 x 10%)

These quizzes will be conducted during class time and will be comprised of a combination of multiple choice and problem solving questions. These quizzes will focus on assessment of fundamental knowledge and skills in genetics and evolutionary biology. They will also provide opportunity for students to measure their progress and prepare for the final examination questions.

Scientific report (10%)

Scientific report is a written assignment where students will have the opportunity to perform online research in scientific literature. On week 1, students will select a topic related to molecular techniques applied in genetics and evolutionary biology. Students can explore the various process and applications in the technique and construct a summarised report. The assessment aims to help students to learn how the knowledge and skills acquired in this course are applied in the industry. It also provides students the opportunity to practice academic writing with appropriate citation and references.

Mid-trimester Exam (20%)

Students will complete a mid-semester exam that will be comprised of multiple choice, short answer and extended problem solving questions. This exam will assess knowledge and skills developed across Weeks 1 to 6. The exam will be approximately one and a half hours in duration.

Final exam (40%)

The three hour exam at the end of the semester will examine the full content of this course, with more emphasis being given to the modules taught after mid-semester exams.

5.3 Late Submission

An assessment item submitted after the due date, without an approved extension from the Course Coordinator, will be penalised. The standard penalty is the reduction of the mark allocated to the assessment item by 5% of the maximum mark applicable for the assessment item, for each working day or part working day that the item is late. Assessment items submitted more than five working days after the due date are awarded zero marks.

Please refer to the Griffith College website - Policy Library > Assessment Policy for guidelines and penalties for late submission.

5.4 Other Assessment Information

Retention of Originals

You must be able to produce a copy of all work submitted if so requested. Copies should be retained until after the release of final results for the course.

Requests for extension

To apply for an extension of time for an assignment, you must submit an [Application for Extension of Assignment](#) form to your teacher at least 24 hours before the date the assignment is due. Grounds for extensions are usually: serious illness, accident, disability, bereavement or other compassionate circumstances and must be able to be substantiated with relevant documentation [e.g. [Griffith College Student Medical Certificate](#)]. Please refer to the Griffith College website - Policy Library - for guidelines regarding extensions and deferred assessment.

Return of Assessment Items

1. Marks awarded for in-trimester assessment items, except those being moderated externally with Griffith University, will be available on the Student Portal within fourteen [14] days of the due date. This does not apply to the final assessment item in this course (marks for this item will be provided with the final course result).
2. Students will be advised of their final grade through the Student Portal. Students can review their exam papers after student grades have been published (see relevant Griffith College Fact Sheet for allocated times at Support> Factsheets). Review of exam papers will not be permitted after the final date to enrol.
3. Marks for **all** assessment items including the final exam (if applicable) will be recorded in the Moodle Course Site and made available to students through the Moodle Course Site.

The sum of your marks overall assessment items in this course does not necessarily imply your final grade for the course. Standard grade cut off scores can be varied for particular courses, so you need to wait for the official release of grades to be sure of your grade for this course.

6. Policies & Guidelines

Griffith College assessment-related policies can be found in the [Griffith College Policy Library](#) which include the following policies:

Assessment Policy, Special Consideration, Deferred Assessment, Alternate Exam Sitting, Medical Certificates, Academic Integrity, Finalisation of Results, Review of Marks, Moderation of Assessment, Turn-it-in Software Use. These policies can be accessed using the 'Document Search' feature within the [Policy Library](#)

Academic Integrity Griffith College is committed to maintaining high academic standards to protect the value of its qualifications. Academic integrity means acting with the values of honesty, trust, fairness, respect and responsibility in learning, teaching and research. It is important for students, teachers, researchers and all staff to act in an honest way, be responsible for their actions, and show fairness in every part of their work. Academic integrity is important for an individual's and the College's reputation.

All staff and students of the College are responsible for academic integrity. As a student, you are expected to conduct your studies honestly, ethically and in accordance with accepted standards of academic conduct. Any form of academic conduct that is contrary to these standards is considered a breach of academic integrity and is unacceptable.

Some students deliberately breach academic integrity standards with intent to deceive. This conscious, pre-meditated form of cheating is considered to be one of the most serious forms of fraudulent academic behaviour, for which the College has zero tolerance and for which penalties, including exclusion from the College, will be applied.

However, Griffith College also recognises many students breach academic integrity standards without intent to deceive. In these cases, students may be required to undertake additional educational activities to remediate their behaviour and may also be provided appropriate advice by academic staff.

As you undertake your studies at Griffith College, your lecturers, tutors and academic advisors will provide you with guidance to understand and maintain academic integrity; however, it is also your responsibility to seek out guidance if and when you are unsure about appropriate academic conduct.

In the case of an allegation of a breach of academic integrity being made against a student he or she may request the guidance and support of a Griffith College Student Learning Advisor or Student Counsellor.

Please ensure that you are familiar with the Griffith College Academic Integrity Policy; this policy provides an overview of some of the behaviours that are considered breaches of academic integrity, as well as the penalties and processes involved when a breach is identified.

For further information please refer to the Griffith College website - Policy Library >Academic Integrity Policy

Reasonable Adjustments for Assessment – The Disability Services policy

The Disability Services policy (accessed using the Document Search' feature with the [Policy Library](#)) outlines the principles and processes that guide the College in making reasonable adjustments to assessment for students with disabilities while maintaining academic robustness of its programs.

Risk Assessment Statement

There are no out of the ordinary risks associated with this course.

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