



## 1. General Course Information

### 1.1 Course Details

<b>Course Code:</b>	1005QBT
<b>Course Name:</b>	Genes and Disease
<b>Trimester:</b>	1, 2021
<b>Program:</b>	Diploma of Health Science
<b>Credit Points:</b>	10
<b>Course Coordinator:</b>	Dr Michael Hahn
<b>Document modified:</b>	19/12/2020

### Course Description

Genes and Disease is a 10 Credit Point course within the Diploma of Health Science. The Diploma of Health Science is designed to provide students with a pathway to:

- further university studies in the Health Sciences or
- direct employment.

In this course students will explore the biological processes on which the continuity of life is based. These include cellular reproduction, in which the information carried in cells is passed on from cell to cell and organism to organism, and basic genetics which focuses on the storage, replication and transmission of such information and how it influences variation in living organisms. Procedures used to investigate biology and genetics at this level, and the strategies used to take advantage of biological processes clinically and commercially will be investigated. The final part of the course then introduces the theme of evolution, discussing historic milestones and developments, evidence for evolution and how evolutionary processes impact populations. Students will participate in case studies and laboratory based demonstrations/simulations designed to enhance their understanding of the course material, providing a challenging opportunity to develop the practical and intellectual skills required of a scientist and/or health care worker.

## Assumed Knowledge

To successfully enrol in this Course, you must provide evidence that you have completed the following course:

- 1014MSC - Cells, Tissues & Regulation

## 1.2 Teaching Team

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

Name	Email
Dr Michael Hahn	Michael.hahn@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 will be published on the Griffith College Portal on the course site.

## 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

Using a variety of resources and teaching methods including online PowerPoint presentations, videos, , online/recorded laboratory related demonstrations/simulations and online/recorded tutorials the aim of this course is to provide students with an appreciation of the amazing potential of living organisms, and also to understand their limitations. To gain this appreciation, it is essential to understand the body at a molecular level, and to understand the processes of cell division, inheritance and structure and function of the material that codes for life, DNA. Many of you will be pursuing careers in healthcare or biomedical research and you will encounter a range of pathologies at some stage in your career, for example, cancer. Understanding cancer involves an understanding of many processes covered in this course – cell division and its control, gene expression, inheritance, DNA mutation, etc. When we consider the impact of genes on the human condition, there are currently over 20,000 known human conditions/diseases that occur due to changes in our genomic sequence, and many more that occur due to alterations in how our genes are expressed. Understanding how to treat disease, maintain health and optimise performance requires an appreciation of how our genetic inheritance influences disease and how interventions affect function at the molecular level. Thus, an understanding of cells, genetics and disease is essential for understanding the complexities of living organisms and for a career in health.



## 2.2 Learning Outcomes

After successfully completing this course you should be able to:

- 1 Discuss how cellular and genetic information is relayed from one generation to the next through the processes of mitosis and meiosis.
- 2 Describe the fundamental concepts of Mendelian genetics and the various experiments that led to the identification of DNA as the genetic material.
- 3 Outline how genotype, via gene expression, determines phenotype and how gene expression controls development. Students should also be able to outline how diseases such as cancer occur when these processes are compromised.
- 4 Understand a number of laboratory techniques that have been developed using the knowledge presented in this course (Biotechnology).
5. Understand the theory of evolution, including the history of its development, the scientific evidence that supports it, its main tenets and how it is used to describe the history of life on earth.



## 2.3 Generic Skills and Capabilities

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 and Capabilities		Taught	Practised	Assessed
Acquisition of discipline knowledge and skills with critical judgement		✓	✓	✓
Communication and collaboration		✓	✓	✓
Self-directed and active learning		✓	✓	
Creative and future thinking			✓	✓
Social responsibility and ethical awareness		✓	✓	✓
Cultural competence and awareness in a culturally diverse environment			✓	



## 3. Learning Resources

### 3.1 Required Learning Resources

PowerPoint presentations, video links, revision questions and answers, laboratory demonstrations/simulations manual, links to online quizzes together with advice and/or links to study skill assistance etc will be included on the course site on Griffith College's Student Portal.

1005MSC Customised textbook: Genes and Disease. ISBN 978148600275 (Customised from Campbell Biology 10th Edition)

Campbell Biology: Australian and New Zealand Edition eBook, 11th Edition  
<https://www.pearson.com.au/9781488619878>

### 3.2 Recommended Learning Resources

No further resources needed.

### 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 academic advice and assignment help from Student Learning Advisors, and personal and welfare support from Student Counsellors.

[Jobs and Employment](#) in the Student Hub can assist students with career direction, resume and interview preparation, 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 Information about your Learning

#### **Attendance**

You are expected to actively engage in all learning experiences and learning activities which underpin the learning content in this course. You are expected to engage with the learning content and learning activities outside of timetabled class times. This requires you to be an active agent of your learning. You are expected to bring all necessary learning resources to class such as the required textbook and /or Workbook. In addition, you are encouraged to 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 Learning**

In order to enhance your learning, you need to prepare before participating in the learning experiences. Absorb the learning content and complete the learning activities that are provided online before you attend the scheduled learning experiences. Make sure you complete the learning activities set each week, they are designed to support your learning. Active participation in your learning will enhance your success. 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 Learning Materials**

Learning materials are made available to you in MyStudy on the Griffith College Portal. The learning materials are arranged in Modules. In each Module you will find the learning content, learning activities and learning experiences. Actively working your way through these course learning materials together with your lecturer or tutor will prepare you to succeed when completing the evidence of learning (assessment).

## **Self-Directed Learning**

You will be expected to learn independently. This means you must organise and engage with the course learning content even when you are not specifically asked to do so by your lecturer or tutor. The weekly guide will be helpful to organise your learning. This involves revising the weekly course learning material and completing the learning activities. It also means you will need to find additional information to evidence your learning (assessment) beyond that given to you, 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 Content, Learning Activities and Learning Experiences

When referring to the table below the type of learning content, activities and experiences shown in Week 1 are similar for each following week but specific for each different topic. Additional activities or experiences are indicated. LO refers to Learning Outcome.

### 4.1 Modules for Learning and Weekly Learning Content, Learning Activities and Learning Experience





WEEK	 Learning Content	 Learning experiences	 Learning activities	 Evidence of learning	LO
<b>Module 1: How is genetic material transferred from one generation to the next? Mitosis and Meiosis</b>					
1	<b>Mitosis:</b> PowerPoint presentation, summary, revision questions and answers available at the completion of Mitosis	Answer Mitosis revision question  Preparation of summary of Mitosis	Course introduction  Feedback on revision Question answers		1
2	<b>Meiosis:</b>	30 question Kahoot quiz	Laboratory 1 Demonstration/simulation - Mitosis and Meiosis	<b>Laboratory Demonstration/simulation workbook quiz 1</b>	1
<b>Module 2: The discovery of DNA as the genetic material</b>					
3	<b>Mendelian Inheritance</b>	Completion of problem-solving exercises set in weekly presentation  Watch video on solving pedigrees  Kahoot quiz – Mendelian Genetics	Laboratory 2 Demonstration/simulation – Blood typing & Human Inheritance	<b>Multiple choice module 1 Moodle online quiz</b>  <b>Laboratory Demonstration/simulation workbook quiz 2</b>	2
4	<b>Chromosomal basis of inheritance</b>	Completion of problem-solving exercises set in weekly presentation			2
5	<b>Molecular Basis of Inheritance</b>	Complete practice midtrimester exam	Feedback on practice midtrimester exam answers		2

	<b>Module 3: How does your DNA (genotype) determine what you look like (phenotype)</b>				
<b>6</b>	<b>Protein Synthesis</b>			<b>Midtrimester Exam</b>	<b>3</b>
<b>7</b>	<b>Gene Expression and Regulation</b>		Laboratory 3 Demonstration/simulation – Polytene Chromosomes	<b>Laboratory Demonstration/simulation workbook quiz 3</b>	<b>3</b>
<b>8</b>	<b>Developmental Genetics</b>	Kahoot quiz covering whole module			<b>3</b>
<b>Module 4: Part 1 Using Biological knowledge to solve problems</b>					
<b>9</b>	<b>Biotechnology</b>	Student presentation of the Biotechnology PowerPoint presentation		<b>Module 3 Moodle online quiz</b>  <b>Student presentations or summary for online delivery</b>	<b>4</b>
<b>Module 4: Part 2 Unifying Biology: Charles Darwin and the theory of evolution</b>					
<b>10</b>	<b>Evolution</b>				<b>5</b>
<b>11</b>	<b>Evolution</b>	Student presentation/discussions on examples of evolution in real time			<b>5</b>
<b>12</b>	<b>Evolution</b>		Feedback on practice final exam answers		<b>5</b>
	<b>Exam Week</b>			<b>Final Exam</b>	<b>5</b>



## 5. Evidence of Learning (Assessment Plan)

### 5.1 Evidence of Learning Summary

	 Evidence of learning	 Weighting	 Learning outcome	 Due Date
1	Moodle 1 quiz	10%	1	Week 3
2	Midtrimester exam	20 %	2	Week 6
3	Module 3 quiz	20%	3	Week 9
4	Laboratory demonstration/simulation workbook quizzes (x3)	15%	1,2,3	End of each laboratory demonstration/simulation
5	Student presentations	5%	4	Week 9
6	Final Exam	30%	4,5	Exam Period

### 5.2 Evidence of Learning Task Detail

#### 1. Mid-trimester exam, Final Exam and Module quizzes

**Rationale:** Each individual quiz is designed to assess the knowledge and understanding of the core concepts covered in each particular module.

**Assessment strategy:** Each quiz may contain multiple choice and/or short answer questions as well as problem solving activities and analysis of experiments.

**Marking criteria:** Answers to multiple choice questions and comparison with model short question answers.

#### 2. Laboratory Demonstration/Simulation Workbook

**Rationale:** During each laboratory, students will complete questions to assess understanding of concepts covered in each laboratory session. This will be handed in at the end of each laboratory demonstration/simulation session.

**Criteria & Marking:** Students will be assessed on the following:

##### Laboratory Demonstration/Simulation 1

- Recognise stages and describe the process of mitosis in plant and animal cells
- Describe consequences of errors in mitosis
- Outline the process and steps of meiosis and gametogenesis. Relate this to the human chromosome number.
- Compare and contrast spermatogenesis with oogenesis with attention to chromosome number

##### Laboratory Demonstration/Simulation 2

- Describe the process for preparing a stained squash of polytene chromosomes from blowfly larvae - Recognise and describe morphological features of polytene chromosomes
- Discuss the significance of polytene chromosomes

##### Laboratory Demonstration/Simulation 3

- Understand and describe the process of ABO and Rh blood typing
- Understand and describe the genetics of the ABO blood system
- Understand and describe the genetics of selected human traits

**Marking criteria:** Comparison of written answers with model short question answers.



### 3. Student Presentation

**Rationale:** Each student or small group of students (depending on class numbers) will present a small section of the Biotechnology PowerPoint presentation to the rest of the class (or prepare a 2 page summary of the material for online students).

**Marking Criteria:** Each student or small group of students will be assessed against a set of criteria that will include how well material was prepared and whether students went beyond the material present in the PowerPoint presentation.

### **IMPORTANT NOTE: In order to pass this course students must:**

- 1. attend and attempt all assessment items; AND**
- 2. obtain at least 40% (20/50) in the final examination, AND**
- 3. achieve an overall course result (sum of all assessments) of 50%.**

### 5.3 Late Submission

An evidence of learning (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. Evidence of learning 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 Information about Evidence of Learning

#### **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 evidence of learning item, 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 Evidence of Learning Items**

1. Marks awarded for in-trimester evidence of learning 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 evidence of learning 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 final exam papers after student grades have been published. Review of final exam papers will not be permitted after the final date to enrol.

3. Marks for **all** evidence of learning 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 of evidence of learning 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 Sitings](#), [Medical Certificates](#), [Academic Integrity](#), [Finalisation of Results](#), [Review of Marks](#), [Moderation of Assessment](#), [Turn-it-in Software Use](#). These policies can be accessed 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 within 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.

Note: For all Diploma level programs, Griffith College acknowledges content derived from Griffith University.