



1. General Course Information

1.1 Course Details

Course Code:	1005QBT
Course Name:	Genes and Disease
Trimester:	1, 2020
Program:	Diploma of Health Science
Credit Points:	10
Course Coordinator:	Dr Michael Hahn
Document modified:	1/02/2020

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 activities 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 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

Using a variety of teaching methods including lectures, practical laboratories and 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 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.
- 5** Understand a number of laboratory techniques that have been developed using the knowledge presented in this course (Biotechnology) and working in small groups demonstrate competency in laboratory techniques used in cytology (the study of cells) including microscopy, staining, blood typing and genetics. Students will then evaluate the experimental results generated from these activities.

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 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 Resources

Lecture notes, lecture slides and laboratory requirements, 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 text book: Genes and Disease. ISBN 978148600275 (Customised from Campbell Biology 10th Edition)

3.2 Recommended 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 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 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 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

Classes for Genes and Disease include the following:

- * **Lectures:** 3 hours per week.
- * **Tutorials/Workshops:** 2 hours per week (week 1 – 12 inclusive).
- * **Laboratories:** Four two (2) hour laboratory sessions throughout the trimester. The first lab session will include an induction session and a laboratory exam will be run in the last session. The laboratory course will include the following topics;
 - Compulsory Laboratory Introduction / Mitosis and Meiosis
 - Polytene Chromosomes
 - Blood Typing and Human Inheritance
 - Competency based laboratory exam

With the laboratory timetable made available on the Griffith College student portal.

Note: ATTENDANCE AT LABORATORIES IS COMPULSORY. These practical sessions provide learning activities that are essential to the learning outcomes in this course. Students will work in small groups to conduct experiments and develop problem solving skills. Students are expected to attend their scheduled laboratory class except in extenuating circumstances.

An attendance roll will be maintained for all laboratories. Students must read the Laboratory Safety requirements prior to attending their first laboratory, and comply with the dress and behaviour codes as described; Students **MUST WEAR LABORATORY COATS AND CLOSED IN SHOES FOR ALL LABORATORIES.** Students will be required to bring their laboratory manuals to laboratories. Content covered in these laboratories complements lecture material and hence will be assessed in both laboratory reports and examinations.

IMPORTANT: All students must undertake the on-line health and safety training prior to being permitted entry into laboratories. As part of your studies you are required to complete the following online Health and Safety Induction modules before you commence your formal learning activities.

1. Student Basic Health and Safety Induction module (no need to print off completion certificate)

2. Health Lab Safety Induction module (no need to print off completion certificate)

4.1 Weekly Learning Activities

Week	Topic	Activity	Readings	Learning Outcomes
1	Introduction to the course and assessment Mitosis and the cell cycle	Lecture/Tutorial/Workshop	Campbell Biology 10th Edition Week 1 Review Questions	1
2	Meiosis and genetic variation	Lecture/Tutorial/Workshop	Campbell Biology 10th Edition Week 2 Review Questions	1
3	Mendelian genetics	Lecture/Tutorial/Workshop	Campbell Biology 10th Edition Week 3 Review Questions	1,2
4	Chromosomal basis of inheritance	Lecture/Tutorial/Workshop	Campbell Biology 10th Edition Week 4 Review Questions	1,2
5	Molecular basis of inheritance	Lecture/Tutorial/Workshop	Campbell Biology 10th Edition Week 5 Review Questions	1,2
6	Protein synthesis	Lecture/Tutorial/Workshop	Campbell Biology 10th Edition Week 6 Review Questions	3
7	Regulating gene expression	Lecture/Tutorial/Workshop	Campbell Biology 10th Edition Week 7 Review Questions	3
8	Developmental genetics	Lecture/Tutorial/Workshop	Campbell Biology 10th Edition Week 8 Review Questions	3
9	Biotechnology	Lecture/Tutorial/Workshop	Campbell Biology 10th Edition Week 9 Review Questions	5
10	Evolution	Lecture/Tutorial/Workshop	Campbell Biology 10th Edition Evolution Review Questions	1,4

11	Evolution	Lecture/Tutorial/ Workshop	Campbell Biology 10th Edition Evolution Review Questions	1,4
12	Case study	Lecture/Tutorial/ Workshop		3

5. Assessment Plan

5.1 Assessment Summary

Item	Assessment Task	Weighting	Learning Outcomes	Due Date
1	Mid trimester examination	25%	1,2	Week 6
2	Laboratory Workbook	12%	1,2,3,5	At the end of each of the first 3 lab sessions
3	Competency based laboratory examination	13%	1,2,3,5	Last Laboratory class
4	Final examination - <i>Students must pass this assessment with a mark of at least 20 out of 50 to pass the course</i>	50%	1,2,3,4,5	Final Exam period

5.2 Assessment Detail

1. Mid-trimester examination

Rationale: This individual assessment item is designed to assess the knowledge and understanding of the core concepts covered in the first five weeks of the trimester and may include problem solving activities and analysis of experiments.

Assessment strategy: the exam will contain multiple choice questions as well as a number of short answer questions.

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

2. Laboratory 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 session.

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

Laboratory 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 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 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

3. Competency-based laboratory examination

Rationale: assessment of knowledge gained from laboratories, including laboratory skills and procedures.

Assessment strategy: This will consist of a number of exercises as outlined below to be completed in the laboratory. Laboratory (competency based) examination to cover material and skills that likely include:

1. Using a light microscope, identify and describe slides as either plant cells undergoing mitosis, animal cells undergoing meiosis or polytene chromosomes
2. Perform ABO blood typing on a blood sample
3. Undertake gene crosses related to ABO blood group, record genotypes and phenotypes
4. Represent the chromosomal display during various stages of mitosis/meiosis

Marking criteria: demonstration of procedures and written answers to questions

4. Final examination:

Rationale: to examine student knowledge acquired throughout the second half of the course (Weeks 6-12).

Assessment strategy: This will be a three hour examination that will contain an approximately equal weighting of multiple choice and written answer questions.

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

Further detailed explanations of assessment expectations will be provided during class and where necessary on the course site on the student portal.

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 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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