Course Code:	1011SCG
Course Name:	Mathematics 1A
Semester:	Semester 1, 2016
Program:	Diploma of Biosciences
	Diploma of Engineering
	Mixed English & Academic Program
Credit Points:	10
Course Coordinator:	Maria Aneiros
Document modified:	06 Feb 2016 09:49:45

Teaching Team

Your lecturer/tutor can be contacted via the email system on the portal.	
Name	**Email**
Brett Wildermoth	**brett.wildermoth@staff.griffithcollege.edu.au**
Maria Aneiros	**maria.aneiros@staff.griffithcollege.edu.au**

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 "myTimetable" link.

Prerequisites

Please note: 1011SCG is a prerequisite for course 1012SCG. This means that you need to achieve a Pass or above to progress to 1012SCG. If you achieve less than a Pass grade, you will need to repeat 1011SCG before progressing to 1012SCG.

Brief Course Description

Mathematics 1A revises and extends basic integral and differential calculus of one variable, introduces partial derivatives and basic vector algebra in two and three dimensions. It provides a foundation for later studies in mathematics and science.

Rationale

Engineers are required to understand the basic mathematical principles that lie behind calculus and vector algebra. The Mathematics 1A [1011SCG] course provides students with an introduction to these mathematical concepts and ideas. The content is designed to develop students understanding of continuous mathematics and their application in engineering.

Aims

This course acts as a bridge between the students' previous experience in mathematics and further tertiary study in mathematics as well as providing the basic mathematical principles required at Diploma level. It provides the basis for the acquisition of the basic computational and theoretical skills necessary for the practising engineer and introduces students to the mathematical way of thinking desirable in the training of effective engineers. This course revises and extends basic integral and differential calculus of one variable, introduces partial derivatives and basic vectors in three dimensions. It provides a mathematical foundation for

later studies in science and engineering.

Learning Outcomes

Upon successful completion of this course you will be able to demonstrate:

1. An ability to think critically

2. An ability to solve problems in a clear and logical fashion

3. An understanding of the basic mathematical knowledge required by employers in the field of engineering

4. Knowledge of the relevant basic definitions and concepts, and how they are applied

5. Knowledge of the basic techniques and methodologies presented in the course

6. An ability to model actual situations in a mathematical way, and to derive useful results.

Texts and Supporting Materials

Set Text Requirements:

Calter P. A, Calter M. A.(2011). Technical Mathematics with Calculus,(6th ed.). Wiley..
Hardcover and eTextbook available for you to purchase from the campus bookshop.

Recommended Texts:

1. Swokowski, E., Olinick, M, Pence, D. P. (1996) Calculus (6th ed.) PWS-Kent Publishing Co.
2. Stewart, A (2010). Calculus Concepts & Context 4th edition. Cengage.
Available at: http://www.stewartcalculus.com/media/9_home.php

Organisation and Teaching Strategies

The contact time in this course takes place over six hours per week. The first three hours each week are for the lecturer to present the theoretical and practical aspects of the concepts to be learned. The next hour is a workshop where you will be given time to go over and practice solving exercises relevant to the theories explained and to prepare assessments.
The final two hours will be the tutorial/workshop, during which you will work through a number of core problems on material presented in the previous week. Each week the lecturer is also available for individual consultation which is an opportunity for students who need extra assistance. Each week the lecturer will set homework for you to complete.

Class Contact Summary

Attendance
As you undertake this course you are expected to:

"¢ Study independently.
"¢ Get 27/30 marks in the algebra quiz
"¢ Sit the mid-semester and final exams.
"¢ Complete all problem sheets and problem classes given during the semester.

Participation in Class
You are expected to actively participate in classes each week.

Consultant Times
Attendance during consultation times 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 on the Griffith College Student Portal - Learning@Griffith College and you are advised to print these out and bring them to each class so that extra notes can be added. You are also expected to bring your text book and calculator to each class.

Independent Learning
You are expected to reinforce your learning from class time by undertaking sufficient independent study {approximately 5 hours per week outside of class time} so that you can achieve the learning outcomes of the course.

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].

Content Schedule

The material taught during this course will be divided into the sections that are shown in the following table.

Weekly Teaching Schedule

Week	Topic	Activity	Readings
1	Review of trigonometric functions and addition formulas; Introductory vectors in 2D	Lecture	Vectors s
	Homework	Lecture	
2	Vectors in 3D, vector addition and subtraction, applications. The Dot and Cross Product of		

	vectors and applications	Lecture	Vectors	
	Homework	Workshop		
3	Introduction to common functions. Domain, Range.	Lecture	Functions	
	Homework	Workshop		
	Assignment	Practical	Due Week 5	
4	Periodic functions. Inverses of functions. Sigma Notation.	Lecture	Functions	
	Homework	Workshop		
5	Limits & Derivatives from First Principals	Lecture	Limits	
	Homework	Workshop		
6	Revision for mid-semester exam	Lecture		
	Mid-semester exam	Examination		
7	Derivatives Homework	Examination	Derivatives	
8	Applications of derivatives to turning points and concavity; small change formula	Lecture	Applications of derivatives from Notes	
	Assignment 2	Practical	Due week 10	
9	Implicit differentiation. Applications of derivatives, curve sketching and optimization.	Lecture	Applications of derivatives	
	Assessed Tutorial 7	Workshop		
10	Applications of derivatives, related rates of change & Taylor expansions	Lecture	Applications of derivatives from Notes	
	Homework	Tutorial		
11	Integration using anti-derivatives and substitution; Applications to areas, mean values	Lecture	Integration section from Notes	
	Homework	Tutorial		
12	Partial derivatives - geometrical interpretation and methods of calculation	Lecture	Partial derivatives section from Notes	
	Homework	Workshop		
13	Final Exam Revision	Lecture		

Assessment

This section sets out the assessment requirements for this course.

Summary of Assessment

Item	Assessment Task	Weighting	Relevant Learning Outcomes	Due Date
1	Algebra (Up to a maximum of four tests available from week 1 to start of week 10) - *Students must pass this assessment with a mark of at least 27 out of 30 to pass the course*	5%	2,3,4	1 to 10
2	Assignment 1	5%	2,4,5	5
3	Mid-semester Exam	25%	1,2,3,4,5,6	6
4	Assignment 2	5%	1,2,3,4,5,6	10
5	HOMEWORK	10%	2,4,5	1 to 12
6	Final Exam	50%	1,2,3,4,5,6	14

Assessment Details

Algebra Quiz Students must pass the basic algebra quiz in order to pass the course.
There will be several opportunities to do this quiz between week 1 and the first day of week 10.

The first online algebra quiz will be held in week 1.

Duration of the exam is 50 mins. Students will be given 30 straightforward algebraic problems to solve. _Students must give correct answers to at least 27_ of these problems to pass the quiz. If students do not pass the quiz the first time, they can repeat a similar quiz up to four times until they obtain a score of 27 or better. NOTE: The DE students will be participating in an online Maths Ready Quiz to assess their readiness to be successful in Diploma Mathematics course. Students who achieve at a certain level in this quiz will be exempted from doing the online Algebra Quiz and will be awarded with 5% for this assessment item.

Homework, designed to test basic understanding of fundamental mathematics. They are single concept tests and review the ability to manipulate and compute. Students will be awarded with 10%, or part there of, for all completed homework.

Take-home assignments are comprised of problems where you need to demonstrate your ability to model, infer and generalise. These will allow you to work on a task at some depth and require you to display inventiveness. You will be asked to solve a set of problems, to show your thinking and create a solution to demonstrate your understanding of mathematics concepts, strategies and procedures. The 2 take-home assignments will be due towards the end of weeks 5, and 10.

The **Mid-semester** and **Final semester exams** test all the content taught in the subject through problem solving questions.

Submission and Return of Assessment Items

Normally you will be able to collect your assignments in class within fourteen [14] days of the due date for submission of the assignment.

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.

Extensions

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 Medical Certificate]. Please refer to the Griffith College website - Policy Library - for guidelines regarding extensions and deferred assessment.

Assessment Feedback

Marks awarded for assessment items will also be available on the on-line grades system on the Student Website within fourteen [14] days of the due date.

Generic Skills

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			
Secondary Research		Yes	
Critical and Innovative Thinking	Yes	Yes	Yes
Academic Integrity		Yes	Yes
Self Directed Learning			
Team Work		Yes	
Cultural Intelligence			
English Language Proficiency		Yes	

Additional Course Generic Skills

Additional Course Information

You will be allowed to use basic scientific non-programmable calculators for this course.

Teacher and Course Evaluations

Students find this course challenging and intensive, but they also do appreciate its importance for laying the foundations for further study. In response to past students' feedback, 6 hours of extra algebra workshops were introduced to help students revise their algebra skills. Past students have commented that the course

resources, assessment items, tutorial activities and teacher's approach were positive in supporting their learning, e.g. \\\"lectures are well organised\\\", \\\" [students] like the weekly tests\\\", \\\"lecturer and tutors are easy to approach and talk to\\\", "you helped so many through such a caring and understanding nature", "this [course] has been an amazing learning experience".

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 online evaluation tool whenever these are available.

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.

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 Academic Integrity Policy on the Griffith College website – Policy Library.

Risk Assessment Statement

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

Copyright © - Griffith College

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