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| Course Code: | 1011SCG |
| Course Name: | Mathematics 1A |
| Semester: | Trimester 3, 2018 |
| Program: | Diploma of Science |
| | Diploma of Engineering |
| | Mixed English & Academic Program |
| Credit Points: | 10 |
| Course Coordinator: | Maria Aneiros |
| Document modified: | 4 th May 2018 |

Teaching Team

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

Maria Aneiros - maria.aneiros@staff.griffithcollege.edu.au

Nima Talebian-

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

Quality mathematics skills are fundamental for success in your diploma and future studies. To assist you in assessing your readiness and level of mathematical skills Griffith College has developed a Maths Ready Quiz and your performance on this quiz will enable us to advise the best pathway for your mathematical studies at the College.

Hence all Diploma of Engineering students are required to undertake an online Wiley Plus maths ready quiz before the semester commences. Students who do not achieve a satisfactory level on this quiz will be advised to undertake a free semester long Maths Preparation course (MTH1) before commencing with the diploma mathematics course.

Brief Course Description

Mathematics 1A introduces basic algebra and functions, vectors in two and three dimensions, matrices, complex numbers and probability in an engineering and science context. It also provides a foundation in the mathematical sciences for later studies in engineering and science fields.

Rationale

To be successful with your chosen area of studies you are required to understand the basic mathematical principles that lie behind linear algebra, matrices and vectors, functions, probability and complex numbers. 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 discrete and continuous mathematics and their applications in engineering and science.

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 and introduces students to the mathematical way of thinking desirable in the training of effective engineers. This course revises and extends basic linear algebra including vectors in two and three dimensions and matrices. complex numbers, probability and basic functions.

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 and knowledge of the basic techniques and methodologies used in basic vector algebra, matrices, functions, probability and complex numbers as required by employers in the fields of science and engineering.
 4. An ability to model actual situations in a mathematical way, and to derive useful results.
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Texts and Supporting Materials

Set Text Requirements:

Griffith University 1201SCG/1010ENG: First Year Mathematics (Custom E-Text)

E-textbook available for purchase from Wiley:
http://www.wileydirect.com.au/buy/1201scg_1010eng/

Recommended Texts:

Swokowski, E., Olinick, M., Pence, D. P. (1996). Calculus (6th ed.) PWS-Kent Publishing Co.

Stewart, A. (2010). Calculus Concepts & Context (4th ed.) Cengage.
Available at: http://www.stewartcalculus.com/media/9_home.php

Washington, A. (2009). Basic Technical Mathematics with Calculus (8th or 9th edition) Pearson (Addison Wesley).

Fitzgerald, G.F. and Peckham, E.A.(2005) Mathematical Methods for Engineers and Scientists (4th edition) Prentice-Hall.

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 and Expectations

As you undertake this course you are expected to:

- Attend all your lecture/tutorial/workshop classes
- Obtain 27/30 marks in the algebra quiz
- Complete weekly online homework and all problem sheets given during the tutorial/workshop classes.
- Undertake all assessment items throughout the trimester and the final examination

Participation in Class

You are expected to actively participate in all class activities throughout the semester.

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.

Consultant Times

Attendance during consultation times is optional but you are strongly 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 textbook or your laptop if you will be using e-textbook and calculator to each class.

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 basic algebra skills and basic functions | Lecture | E-book Topic 1.Introduction to Algebra E-book Topic 3.Functions |
| 2 | Matrices | Lecture | Portal Notes and E-book Topic 9.Matrices and Determinants |
| 3 | Matrices | Lecture | Portal Notes and E-book Topic 9.Matrices and Determinants |
| 4 | Vector addition and subtraction and applications | Lecture | Portal Notes and E-book Topic 6.Three-Dimensional Space; Vectors |
| 5 | The dot and cross product of vectors and applications | Lecture | Portal Notes and E-book Topic 6.Three-Dimensional Space; Vectors |
| 6 | Mid-semester exam Log, exponential, trigonometric and periodic functions | Examination Lecture | Portal Notes and E-book Topic 8.Before Calculus |
| 7 | Complex Numbers | Lecture | Portal Notes and E-book Topic 7.Complex Numbers |
| 8 | Complex Numbers | Lecture | Portal Notes and E-book Topic 7.Complex Numbers |
| 9 | Complex Numbers | Lecture | Portal Notes and E-book Topic 7.Complex Numbers |
| 10 | Test on Complex Numbers & Functions | Examination | |

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|----|------------------------------|---------|--|
| | Probability and Applications | Lecture | Portal Notes and E-book Topic 10.Probability |
| 11 | Probability and applications | Lecture | Portal Notes and E-book Topic 11.Discrete Random Variables |
| 12 | 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 9) <i>- Students must pass this assessment with a mark of at least 27 out of 30 to pass the course</i> | 5% | TBA | 1 to 9 |
| 2 | Mid-semester Exam on Functions, Matrices & Vectors | 25% | 1, 2, 3 & 4 | 6 |
| 3 | Test on Complex Numbers & Functions | 10% | 1, 2, 3 & 4 | 10 |
| 4 | Online Homework & In-class workbook | 10% | 1, 2, 3 & 4 | 1 to 12 |
| 5 | Final Exam on Functions, Complex Numbers and Probability | 50% | 1, 2, 3 & 4 | 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 9.

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

Duration of the exam is 50 minutes. 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 Diploma of Engineering 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.

Online Homework & In-class workbook - are single concept tests and are designed to test basic understanding of fundamental mathematics. Students will be awarded with 10%, or part thereof, for all completed homework.

Mid-semester exam on functions, matrices and vectors is designed to test understanding of the concepts taught in weeks 1 to 5. Students will be expected to know what a function is and how to use it. Furthermore, students will be expected to know what are matrices and their operations. Students will be expected to know what a vector is, what operations can be done with vectors and solve worded problems. Duration of the test will be 2 hours and it will be held during week 6.

Test 1 on complex numbers & functions is designed to test understanding of the concepts taught in weeks 6 to 9. Students will be expected to know the different kind of exponential, logarithmic and periodic functions as well as how to use them. Furthermore, students will be expected to know what are complex numbers, their operations and how to use them. Duration of the test will be 50 minutes and it will be held during the first hour of week 10.

The **Final exam** tests the content taught in the subject from week 6 till week 12, 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

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 CollegeTMs 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.

In the case of a breach of academic integrity 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 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.

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