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| Course Code: | 1012SCG |
| Course Name: | Mathematics 1B |
| Semester: | Trimester 2, 2017 |
| Program: | Diploma of Engineering |
| Credit Points: | 10 |
| Course Coordinator: | Maria Aneiros |
| Document modified: | 16 th June 2017 |

Teaching Team

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

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

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

- 1011SCG - Mathematics 1A
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Brief Course Description

Mathematics [1012SCG] course provides students with an introduction to the basic mathematical principles that lie behind calculus.

Rationale

Engineers are required to understand the basic mathematical principles that lie behind calculus. Mathematics [1012SCG] 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 extends the range of fundamentals mathematical techniques available to students to enable them to analyze physical processes mathematically. A sound knowledge of these techniques is vital for students undertaking studies in 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 in functions, limits, calculus and differential equations as required by employers in the field of science and engineering
4. Knowledge of the basic techniques and methodologies used in functions and their inverses, limits, calculus and its applications and first order ordinary differential equations.
5. An ability to model actual situations in a mathematical way, and to derive useful results.

Texts and Supporting Materials

We have developed an e-text book which is available for purchase from Wiley. Please visit the link below and purchase this book:

http://www.wileydirect.com.au/buy/1201scg_1010eng/

Set Text Requirements:

Anton H., Bivens I. C., Davis S.. (2012). Calculus Early Transcendentals, (10th ed.). Wiley. eTextbook available for you to purchase online.

Suggested Reference Texts:

Stewart, A (2010). Calculus Concepts & Context 4th ed). Cengage.

Fitzgerald G.F. and Peckham E.A., (2002). Mathematical Methods for Engineers and Scientists, (3rd ed.), Prentice-Hall.

Edwards C.H. and Penney D.E., (2002). Calculus, Early Transcendentals (6th ed.) Prentice Hall.

Larson R., Hostetler R.P. and Edwards B.H., (2006). Calculus with Analytical Geometry, (8th ed.), Houghton Mifflin, Boston.

Organisation and Teaching Strategies

The contact time in this course takes place over five hours. Three hours of each week are for the lecturer to present the theoretical and practical aspects of the concepts to be learned.

During the one hour tutorial, you will work through a number of core problems on material presented in the previous week. In the one-hour workshop guidance will be provided to extend your understanding of the material, and to provide guidance with assessment.

Each week the lecturer will prepare an online homework for you to complete. This work must be completed in preparation for the class in the following week and will be assessed during the workshop/tutorial classes.

Class Contact Summary

Attendance and Expectations

As you undertake this course you are expected to:

Attend all your lecture/tutorial/workshop classes.

Complete weekly online homework and all problem sheets given during the tutorial/workshop classes.

Undertake the diagnostic test on integration/differentiation.

Undertake the mid-semester and final exams.

Participation in Class

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

Independent Learning

You are expected to reinforce your learning from class time by undertaking sufficient independent study {approximately 6 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 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 or your laptop if you will be using an e-textbook and calculator to each class.

Independent Learning

You are expected to reinforce your learning from class time by undertaking sufficient independent study {approximately 6 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

Weekly Teaching Schedule

| Week | Topic | Activity | Readings |
|------|---------------------------------------------------------------------------------------------|----------------------------|--------------------------------------------------------------------|
| 1 | Review of functions | Lecture | E-book Topic 3.Functions |
| 2 | Continuous functions, including exponential, logarithmic and trigonometric functions | Lecture | E-book Topic 8.Before Calculus |
| 3 | Limits | Lecture | E-book Topic 13.Limits and Continuity |
| 4 | Test on functions and limits Definition of derivatives and rules for differentiation | Examination Lecture | E-book Topic 14.The Derivative |
| 5 | Turning points, point of inflection, concavity and applications of differentiation | Lecture | E-book Topic 15.The Derivative in Graphing and applications |
| 6 | L'Hopital's Rule, Taylor Series | Lecture | E-book Topic 16 & 17.Topics in Differentiation And Infinite series |
| 7 | Test on differentiation and its applications Basics of Integration | Examination Lecture | E-book Topic 18.Integration |
| 8 | Further techniques of integration | Lecture | E-book Topic 19.Principles of Integral Evaluation |

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|----|-------------------------------------------------------------------------------------------------|----------------------------|----------------------------------------------------------------------------|
| 9 | Applications of integration | Lecture | E-book Topic 20.Applications of the Definite Integral |
| 10 | Test on integration and its applications Introduction to ordinary differential equations | Examination Lecture | E-book Topic 21.Mathematical Modelling with Differential Equations |
| 11 | Further ordinary differential equations & their applications | Lecture | E-book Topic 21.Mathematical Modelling with Differential Equations |
| 12 | Exam preparation and revision | Workshop | |

Assessment

This section sets out the assessment requirements for this course.

Summary of Assessment

| Item | Assessment Task | Weighting | Relevant Learning Outcomes | Due Date |
|------|--------------------------------------------|-----------|----------------------------|----------|
| 1 | Test on functions & limits | 10% | 1,2,3,4 | 4 |
| 2 | Test on differentiation & its applications | 10% | 1,2,3,4 | 7 |

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|---|----------------------------------------|-----|-----------|------------------------|
| 3 | Test on integration & its applications | 10% | 1,2,3,4 | 10 |
| 4 | In-class quizzes & online homework | 20% | 1,2,3,4,5 | 2,3,4,5,7,8,9,10,11,12 |
| 4 | Final Exam | 50% | 1,2,3,4,5 | 13 |

Assessment Details

The test on limits, derivatives and rules for differentiation will assess student's overall grasp of the concepts and methods presented during the first four weeks of the semester.

The test on differentiation & its applications is designed to check the student's ability to differentiate and use it to solve worded problems on differentiation applications.

The test on integration & its applications is designed to check the student's ability to integrate and use it to solve worded problems on integration applications.

The in-class quizzes & online homework will assess student's basic understanding of the fundamental mathematics concepts presented each week. They are single concept and review the ability to manipulate and compute.

Students must attend and actively participate in at least 9 of the 10 weekly tutorials.

The **final semester exam** is designed to assess your overall grasp of the concepts and methods covered in Calculus and its applications.

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. You may arrange an appointment during the designated consultation time to discuss assessment in more detail.

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

Additional Course Generic Skills

Additional Course Information

Teacher and Course Evaluations

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.

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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