Course Code: 1011SCG
Course Name: Mathematics 1A
Semester: Semester 1, 2015
Program:
- Diploma of Biosciences
- Diploma of Engineering
- Mixed English & Academic Program
Credit Points: 10
Course Coordinator: Maria Aneiros

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brett Wildermoth</td>
<td><a href="mailto:brett.wildermoth@staff.qibt.qld.edu.au">brett.wildermoth@staff.qibt.qld.edu.au</a></td>
</tr>
<tr>
<td>Maria Aneiros</td>
<td><a href="mailto:maria.aneiros@staff.qibt.qld.edu.au">maria.aneiros@staff.qibt.qld.edu.au</a></td>
</tr>
</tbody>
</table>

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 QIBT 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:
QIBT 1011SCG Mathematics 1A Printed notes will be available for you to purchase.

Recommended Texts:
   Available at: http://www.stewartcalculus.com/media/9_home.php Click Here

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 "Common Time" where you will be given one hour with another lecturer/tutor to prepare for the following week’s in-class tests and other 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. This work must be completed in preparation for the class in the following week. This work will be assessed during the problem classes held in weeks 2-6 and 8-12.

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 QIBT Student Portal - Learning@QIBT 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 QIBT Policy Library - Program progression Policy - for more information].

Content Schedule

Common Time
Another lecturer/tutor is available for one hour every week so that you can ask questions and prepare for assessments. The common time, room and day of the week will show in your timetable.

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

### Weekly Teaching Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Activity</th>
<th>Readings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Review of trigonometric functions and addition formulas; Introductory vectors in 2D</td>
<td>Lecture</td>
<td>Vectors section from Notes</td>
</tr>
<tr>
<td></td>
<td>Algebra Quiz 1</td>
<td>Tutorial</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Vectors in 3D, vector addition and subtraction, applications. The Dot and Cross Product of vectors and applications</td>
<td>Lecture</td>
<td>Vectors section from Notes</td>
</tr>
<tr>
<td></td>
<td>Assessed Tutorial 1</td>
<td>Workshop</td>
<td></td>
</tr>
</tbody>
</table>
### Assessment

This section sets out the assessment requirements for this course.

#### Summary of Assessment

<table>
<thead>
<tr>
<th>Item</th>
<th>Assessment Task</th>
<th>Weighting</th>
<th>Relevant Learning Outcomes</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Algebra - Students must pass this assessment with a mark of at least 27 out of 30 to pass the course</td>
<td>5%</td>
<td>2,3,4</td>
<td>1, 3 &amp; 4</td>
</tr>
<tr>
<td>2</td>
<td>TUTORIALS - IN CLASS. Marks awarded will be based on the best 8 problems sheets done by a student</td>
<td>10%</td>
<td>2,4,5</td>
<td>2 - 6 &amp; 8 - 12</td>
</tr>
<tr>
<td>3</td>
<td>Assignment 1</td>
<td>5%</td>
<td>2,4,5</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Mid-semester Exam</td>
<td>25%</td>
<td>1,2,3,4,5,6</td>
<td>7</td>
</tr>
<tr>
<td>5</td>
<td>Assignment 2</td>
<td>5%</td>
<td>1,2,3,4,5,6</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>Final Exam</td>
<td>50%</td>
<td>1,2,3,4,5,6</td>
<td>14</td>
</tr>
</tbody>
</table>

#### Assessment Details

**Algebra Quiz** is a basic algebra skills test to review knowledge of elementary mathematics from secondary school.

**NOTE:** You must pass the basic algebra test in order to pass the subject. Passing the algebra quiz requires achieving at least 27 out of the 30 marks allocated to the test. There will be several opportunities to do this test between weeks 1 and 4. If you do not pass the algebra test first time, it is compulsory that you attend 6 hours of algebra workshops scheduled in weeks 1, 2 and 3.
In-class exercises test basic understanding of fundamental mathematics. They are single concept tests and review the ability to manipulate and compute. You should attend and actively participate in at least 8 of the 10 weekly problem sheets. Marks awarded will be based on the best 8 problems sheets done by a student.

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 hand-in problem sheets 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 assessment item you must submit a written request to your lecturer via the Student Website at least 48 hours before the date the assessment item 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. medical certificate]. Please refer to the QIBT website - Policy Library - for guidelines regarding extensions and deferred assessment.

Penalties for late submission without an approved extension

Penalties apply to assignments that are submitted after the due date without an approved extension. Assessment submitted after the due date will be penalised 10% of the TOTAL marks available for assessment (not the mark awarded) for each day the assessment is late. Assessment submitted more than five days late will be awarded a mark of zero (0) For example:

- > 5 minutes and <= 24 hours 10%
- > 24 hours and <= 48 hours 20%
- > 48 hours and <= 72 hours 30%
- > 72 hours and <= 96 hours 40%
- > 96 hours and <= 120 hours 50%
- > 120 hours 100%

Note:

- Two day weekends will count as one day in the calculation of a penalty for late submission.
- When a public holiday falls immediately before or after a weekend, the three days will count as one day in the calculation of a penalty for late submission.
- When two public holidays (e.g. Easter), fall immediately before or after, or one day either side of a weekend, the four days will count as two days in calculating the penalty for late submission.
- When a single public holiday falls mid-week, the day will not be counted towards the calculation of a penalty.

Please refer to the QIBT website - Policy Library > Assessment Policy for guidelines and penalties for late submission.

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

QIBT 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:

<table>
<thead>
<tr>
<th>Generic Skills</th>
<th>Taught</th>
<th>Practised</th>
<th>Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written Communication</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Oral Communication</td>
<td>Yes</td>
<td></td>
<td></td>
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<tr>
<td>Information Literacy</td>
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<td>Secondary Research</td>
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<tr>
<td>Critical and Innovative Thinking</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Academic Integrity</td>
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<td>Self Directed Learning</td>
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<td>Team Work</td>
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<tr>
<td>Cultural Intelligence</td>
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<td></td>
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<tr>
<td>English Language Proficiency</td>
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</table>
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”, “Lecturers 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 QIBT’s online evaluation tool whenever these are available.

Academic Integrity

QIBT 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, QIBT 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 QIBT, 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 QIBT 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 QIBT website – Policy Library.

Risk Assessment Statement

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