Course Code: PHY001A
Course Name: Physics 1
Semester: Semester 1, 2015
Program: Certificate IV Tertiary Preparation Program
Credit Points: 10
Course Coordinator: James O'Connell

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>Amanda Day</td>
<td><a href="mailto:Amanda.Day@staff.qibt.qld.edu.au">Amanda.Day@staff.qibt.qld.edu.au</a></td>
</tr>
<tr>
<td>Wayne Stevens</td>
<td><a href="mailto:wayne.stevens@staff.qibt.qld.edu.au">wayne.stevens@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

There are no prerequisites for this course

Brief Course Description

This course provides students with an introduction to the study of matter, energy, and their interactions. It will provide students with a basic understanding of a broad range of physics concepts - necessary if they wish to continue studies at the tertiary level in engineering, science, or environmental science.

Rationale

Entry to tertiary study in fields such as engineering and science requires a basic understanding of physics. This course is designed to provide students with knowledge in a broad range of physics concepts, and to help students appreciate the impact of physics and technology on society.

This course involves practical investigations that require logical and analytical thinking, as well as the communication of scientific information and ideas. Through the development of knowledge of the basic principles of physics, students will be able to explain many natural phenomena. It will also enable students to apply these phenomena in technologies that are important to modern day society.

Aims

The course aims to provide students with a basic knowledge of a broad range of physics concepts and processes. Students will develop analytical, problem solving, calculation and technical report writing skills.

Learning Outcomes

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

1. An understanding of the basic mathematical and geometric skills and manipulations required to effectively apply and understand concepts in Physics;
2. An understanding of the principles of motion and the effect of forces;
3. An understanding of momentum, work and energy, and how they relate to forces and motion;
4. An understanding of heat as a form of energy, and various heat-related phenomena;
5. An understanding of wave motion, light, optics and wave-related phenomena;
6. An understanding of electricity and magnetism, including basic electric circuits and electromagnetism.
7. A brief glimpse into relativity and quantum mechanics - the world is not always as it seems!
8. Analytical, problem solving, calculation and technical report writing skills
9. Use of scientific processes to collect and organise data in simple situations

**Texts and Supporting Materials**

Recommended:


**Organisation and Teaching Strategies**

The teaching and assessment portion of the semester is of 14 weeks duration - inclusive. Classes are usually four (4) hour duration, however, where class sizes are small they may be reduced to three (3) hours.

Course delivery consists of a combination of formal lecturing, laboratory exercises and tutorials. During the lecture component concepts and techniques needed in order to pass the course will be presented and discussed.

Where class times conflict with Public Holidays, ‘makeup’ classes may be organised on a different day. You are advised to make inquiries about these Public Holidays to determine when the relevant class will be held.

**Class Contact Summary**

**Attendance:**

Your attendance in class will be marked twice during a four hour class. To receive full attendance, you must be present in the classroom on both occasions. Before attending classes each week you are also expected to have pre-read the lecture notes and read through the relevant readings from the text and other sources. Therefore, you are encouraged to attend and participate in all classes throughout the semester.

**Participation in Class:**

During classes each week you are expected to actively participate in exercises covering the current topic.

**Consultation 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 Learning@QIBT site on the student portal and you are advised to print these out before each class to help guide you in your study program. You are expected to bring your lecture notes together and textbook to each class.

**Laboratory Exercises:**

Before attending the laboratory exercise sessions, you must read the Laboratory exercises.

**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 with passing grades achieved in more than 50% of courses in any semester [please see QIBT Policy Library - Program Progression Policy - for more information].

**Content Schedule**

The Weekly Teaching Schedule provides an overview of the structure and progression of topics taught in this course. Topics chosen may vary in selection, depth of treatment or be moved forward or back in the schedule, subject to the learning requirements of students.

**Weekly Teaching Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Activity</th>
<th>Readings</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Course Introduction &amp; Course Outline</td>
<td>Class</td>
<td></td>
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<tr>
<td></td>
<td>The Scientific Method</td>
<td>Class</td>
<td></td>
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<tr>
<td></td>
<td>Measurement and Quantities</td>
<td>Class</td>
<td></td>
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<tr>
<td>2</td>
<td>Vectors and Graphing</td>
<td>Class</td>
<td></td>
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<tr>
<td>3</td>
<td>Motion in One Dimension</td>
<td>Class</td>
<td></td>
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<tr>
<td>4</td>
<td>Forces</td>
<td>Class</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quiz 1</td>
<td>Class</td>
<td></td>
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<tr>
<td>5</td>
<td>Quiz 1</td>
<td>Examination</td>
<td></td>
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<tr>
<td></td>
<td>Motion in Two Dimensions and Simple Harmonic Motion</td>
<td>Class</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Momentum, Work and Energy</td>
<td>Class</td>
<td></td>
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<tr>
<td>7</td>
<td>Thermodynamics</td>
<td>Class</td>
<td></td>
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<tr>
<td>8</td>
<td>Mid-Semester Examination</td>
<td>Examination</td>
<td></td>
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<tr>
<td>9</td>
<td>Wave Motion</td>
<td>Class</td>
<td></td>
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<tr>
<td>10</td>
<td>Light and Optics</td>
<td>Class</td>
<td></td>
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<tr>
<td>11</td>
<td>Electricity and Electric Circuits</td>
<td>Class</td>
<td></td>
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<tr>
<td>12</td>
<td>Magnetism and Electromagnetism</td>
<td>Class</td>
<td></td>
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<tr>
<td>13</td>
<td>Relativity and Quantum Mechanics - A Brief Introduction</td>
<td>Class</td>
<td></td>
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<td></td>
<td>Exam Revision</td>
<td>Class</td>
<td></td>
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</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>Quiz 1</td>
<td>20%</td>
<td>1,2,8&amp;9</td>
<td>Week 5</td>
</tr>
<tr>
<td>2</td>
<td>Mid-Semester Exam</td>
<td>25%</td>
<td>1,2,3,4,8&amp;9</td>
<td>Week 8</td>
</tr>
<tr>
<td>3</td>
<td>Assignment</td>
<td>15%</td>
<td>All</td>
<td>Week 11</td>
</tr>
<tr>
<td>4</td>
<td>Final Exam</td>
<td>40%</td>
<td>1,5,6,7,8&amp;9</td>
<td>Week 14</td>
</tr>
</tbody>
</table>

Assessment Details

The assessment for this course is divided into two sections:

- Theoretical and conceptual understanding is tested in the quiz and exams;
- The application of theoretical concepts is tested in the assignment.

You are expected to complete the quiz and exams individually. You will be assigned groups for the assignment.

The assessment items progressively increase in weighting to allow students time to adjust to the course, and plan and monitor their current and future learning progress.

Quiz 1
Quiz 1 will assess your foundation knowledge and skills from weeks 1-4 of the semester, and relates to learning outcomes 1, 2, 8 and 9.

Mid-Semester Exam
The mid-semester exam further expands on Quiz 1 by additionally assessing the topics covered in weeks 5-7. The mid-semester exam relates to learning outcomes 1, 2, 3, 4, 8 & 9.

Assignment
The assignment will assess your ability to operate safely and proficiently in a physics laboratory, to collect and organise data, to devise and design simple investigations, and to use complex reasoning processes. The skills needed to present experimental data and write scientific laboratory reports are also developed (Relates to all objectives).

NOTE: You will be asked to submit both a paper and electronic copy of your Laboratory Reports (see Submission and Return of Assessment Items section below for further information).

Final Exam
The final examination assesses your knowledge and skills in the topics presented following the mid-semester exam. The final exam relates to learning outcomes 1, 5, 6, 7, 8, and 9.

Submission and Return of Assessment Items

Normally you will be able to access your results within fourteen [14] days of the due date for submission of the assignment. ALL assessment submitted in this course must be retained by QIBT as directed by the Australian Skills Quality Authority (ASQA) made under section 28 (1) of the National Vocational Education and Training Regulator Act 2011.

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>
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<tr>
<td>Oral Communication</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Information Literacy</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Secondary Research</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</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>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Self Directed Learning</td>
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<tr>
<td>Team Work</td>
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<td>Yes</td>
<td>Yes</td>
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<td>Cultural Intelligence</td>
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<td>English Language Proficiency</td>
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**Additional Course Generic Skills**

**Additional Course Information**

In addition to formal contact hours, you are provided with extra support through individual consultation with lecturers, English language support, and self-access computer laboratories.

**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 on the QIBT portal 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**
This course follows QIBT and Griffith University Workplace Health and Safety Laboratory guidelines.

The aim of workplace health and safety is to make sure that people do not get sick or injured at the workplace. The legislation dealing with this in Queensland is called the Workplace Health and Safety Act, 1995. Anyone who can affect workplace health and safety has an obligation under this Act.

As a student, you have an obligation to yourself and others to undertake activities in a safe manner. You must follow instructions which are provided for safety. You must not put yourself or anyone else at risk. Care especially needs to be taken when you are performing activities which can affect others.

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