

9. Year 12 Subjects 2011 (Science)

VCE Physics

Unit 3: Physics

Areas of Study:

This unit consists of three areas of study:

- *Motion in one and two dimensions* - Newtonian theories give important insights into a range of motions, and contribute towards safety considerations. This study focuses on everyday motion.
- *Electronics and photonics* - Photonics is the science of using light to manipulate information and energy and involves all facets of visible, ultraviolet and infrared radiation.
- *Detailed studies* - Three detailed studies are available in Unit 3. One detailed study is to be selected from:
 - ❖ Einstein's special relativity; Materials and their use in structures; Further electronics.
 - ❖ The selected detailed study requires approximately 12 hours of class time.

Assessment:

Unit 3 consists of three separate outcomes:

- Outcome 1 - Students should be able to investigate motion and related energy transformations experimentally, and use the Newtonian model in one and two dimensions to analyse motion in the context of transport and related aspects of safety, and motion in space.
- Outcome 2 - Students should be able to investigate, describe, compare and explain the operation of electronic and photonic devices, and analyse their use in domestic and industrial systems.
- Outcome 3.1 - Students should be able to use Einstein's theory of relativity to describe and explain relativistic motion and effects, and make comparisons with classical descriptions of motion OR
- Outcome 3.2 - Students should be able to analyse and explain the properties of construction materials, and evaluate the effects of forces and loads on structures and materials OR
- Outcome 3.3 – Students should be able to design and investigate an AC to DC voltage regulated power supply system, and describe and explain the operation of the system and its components, and the effects of test equipment on the system.

Assessment Break-Down:

For this unit, students must complete the following:

- A student-designed extended practical investigation AND
- at least two different tasks selected from the following:
 - ❖ a multimedia presentation; an annotated folio of practical activities; a summary report of selected practical activities from the student's log book; a data analysis; a report (written, oral, annotated visual); a test (short answer and extended response); a response to a media article.

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VCE Physics (Cont...)

Unit 4: Physics

Areas of Study:

This unit consists of three areas of study:

- *Electric power* - The generation, transmission, distribution and use of electric power are crucial to modern life. Students will use evidence and models of electrical, magnetic and electromagnetic effects in several contexts (eg electric motors, generators, alternators and transformers, electric power transmission).
- *Interactions of light and matter* - Students will use mathematical models and explanations to interpret evidence about the interactions of light and matter.
- *Detailed studies* - Three detailed studies are available in Unit 4. One detailed study is to be selected from:
 - ❖ Synchrotron and its applications; Photonics; Sound.
 - ❖ The selected detailed study requires approximately 12 hours of class time.

Assessment:

Unit 4 consists of three separate outcomes:

- Outcome 1 - Students should be able to investigate and explain the operation of electric motors, generators and alternators, and the generation, transmission, distribution and use of electric power.
- Outcome 2 - Students should be able to use wave and photon models to analyse, interpret and explain interactions of light and matter and the quantised energy levels of atoms.
- Outcome 3.1 - Students should be able to describe the basic design and operation of The Australian Synchrotron and the production, characteristics and interactions with targets of synchrotron radiation OR
- Outcome 3.2 - Students should be able to apply the photon and wave models of light to describe and explain the operation of different light sources and fibre optic wave-guides and analyse their domestic, scientific and industrial uses OR
- Outcome 3.3 - Students should be able to apply a wave model of sound and a field model of electromagnetism to describe, analyse and evaluate the recording and reproduction of sound.

Assessment Break-Down:

For this unit, students must complete the following:

- A summary report of selected practical activities from the student's log book AND
- at least two different tasks selected from the following (these tasks should constitute the assessment for the two remaining outcomes):
 - ❖ a multimedia presentation; an annotated folio of practical activities; a student-designed extended practical investigation; a report (written, oral, annotated visual); a test (short answer and extended response).

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VCE Physics (Cont...)

Assessment - Units 3 and 4

The award of satisfactory completion for a unit is based on a decision that the student has demonstrated achievement of the set of outcomes specified for the unit. This decision will be based on the teacher's assessment of the student's overall performance designated for the unit.

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| • Unit 3 School-Assessed Coursework | 17% |
| • Unit 3 Mid-year Examination | 33% |
| • Unit 4 School-Assessed Coursework | 17% |
| • Unit 4 End-of-year Examination | 33% |

Other Information

- Physics has a mid-year Exam AND an end of year Exam. A Practice Exam for the June Exam is held towards the end of May. Other practice exams are also held during Semester Two. It is important that students take every opportunity to ready themselves for these examinations.

Entry – Units 3 and 4

Students are expected to have completed Unit 1 and or 2 Physics prior to attempting to complete the Unit 3 and 4 progression. Students must complete Unit 3 before completing Unit 4.