



## Physics

### STAGE 6 HSC ~ COURSE OUTLINE

Physics investigates natural phenomena, identifies patterns and applies models, principles and laws to explain their behaviour.

The *HSC course* builds on the concepts of the Preliminary course by expanding on areas such as relativity, the motor effect and solid state physics, and by focusing on space flight, motors and generators and the scientific advances involved in the development of semi-conductors and electronics. The options cover a variety of interest areas and draw on the increased information and understanding provided by improved technology to examine areas of current research.

#### TOPICS COVERED

##### ***HSC Course***

Physics Skills Module 9.1

##### **Core Modules**

- Space
- Motors and Generators
- From Ideas to Implementation

##### **One Option from the following modules:**

- Geophysics
- Medical Physics
- Astrophysics
- From Quanta to Quarks
- The Age of Silicon

#### COURSE REQUIREMENTS

Each module specifies content which provides opportunities for students to achieve the Physics skill outcomes. Physics module 9.1 (HSC) provide the skills content that must be addressed within and across each course. Teachers should provide opportunities based on the module content to develop the full range of skills content identified in Physics skills modules and 9.1.

Students will complete a minimum of 80 indicative hours of practical experiences across Preliminary and HSC course time with no less than 35 hours in the HSC course.

#### SYLLABUS OUTCOMES

- H1** Evaluates how major advances in scientific understanding and technology have changed the direction or nature of scientific thinking
- H2** Analyses the ways in which models, theories and laws in physics have been tested and validated

- H3** Assesses the impact of particular advances in physics on the development of technologies
- H4** Assesses the impacts of applications of physics on society and the environment
- H5** Identifies possible future directions of physics research
- H6** Explains events in terms of Newton's Laws, Law of Conservation of Momentum and relativity
- H7** Explains the effects of energy transfers and energy transformations
- H8** Analyses wave interactions and explains the effects of those interactions
- H9** Explains the effects of electric, magnetic and gravitational fields
- H10** Describes the nature of electromagnetic radiation and matter in terms of the particles
- H11** Justifies the appropriateness of a particular investigation plan
- H12** Evaluates ways in which accuracy and reliability could be improved in investigations
- H13** Uses terminology and reporting styles appropriately and successfully to communicate information and understanding
- H14** Assesses the validity of conclusions from gathered data and information
- H15** Explains why an investigation is best undertaken individually or by a team
- H16** Justifies positive values about and attitude towards both the living and non-living components of the environment, ethical behaviour and a desire for critical evaluation of the consequences of the applications of science

### BOSTES Assessment Information

External examination	Marks	Internal assessment	Weighting
<i>Section I – Core</i> Part A Objective response questions Part B Short-answer questions	20 55	A. Knowledge and understanding of: <ul style="list-style-type: none"> <li>the history, nature, and practice of physics, applications and uses of physics and their implications for society and the environment, and current issues, research and developments in physics</li> <li>kinematics and dynamics, energy, waves, fields and matter</li> </ul>	40
<i>Section II – Options</i> Candidates answer one question on the option they have studied	25	B. Skills in: <ul style="list-style-type: none"> <li>planning and conducting firsthand investigations</li> <li>gathering and processing firsthand data</li> <li>gathering and processing relevant information from secondary sources</li> </ul>	30
		C. Skills in: <ul style="list-style-type: none"> <li>communicating information and understanding</li> <li>developing scientific thinking and problem-solving techniques</li> <li>working individually and in teams</li> </ul>	30
<b>TOTAL MARKS</b>	<b>100</b>	<b>TOTAL MARKS</b>	<b>100</b>

### School Based Evidence of Learning ~ Formal Task Schedule

Task No.	Targeted Outcomes	Learning Context	Task	Date Due	Weighting			Marks
					A	B	C	
1	H – 5, 6, 11, 12, 13, 14, 15	Space	Open-ended investigation	Tm 4 Wk 9	10%	15%	10%	35%
2	H – 7, 11, 12, 13, 14	Motors and Generators	Practical Task	Tm 1 Wk 7	15%	15%	5%	35%
3	H – 1, 2, 3, 4, 13	Ideas to implementation	Research and Oral Presentation	Tm 2 Wk 6	5%		15%	20%
4	H – 6-10	All Topics	Trial HSC Examination	Tm 2 Wk 9/10	10%			10%
<b>TOTAL</b>					<b>40%</b>	<b>30%</b>	<b>30%</b>	<b>100%</b>