

## Biology

### COURSE DETAILS

<b>Hours</b>	240 hours
<b>Type</b>	Board Developed Course
<b>Duration</b>	2 years
<b>Unit Value</b>	2-unit Year 11 2-unit Year 12
<b>HSC Exam</b>	Yes
<b>ATAR</b>	Yes
<b>Exclusions</b>	None
<b>RECOGNITION</b>	Year 12 Qualification

### COURSE DESCRIPTION

The Biology course explores the diversity of life from a molecular to a biological systems level. The course examines the interactions between living things and the environments in which they live. It explores the application of Biology and its significance in finding solutions to health and sustainability issues in a changing world.

The course provides the foundation knowledge and skills required to study biology after completing school and supports participation in a range of careers in Biology and related interdisciplinary industries. It is a fundamental discipline that focuses on personal and public health and sustainability issues and promotes an appreciation for the diversity of life on the Earth and its habitats.

### AIMS

The study of Biology in Stage 6 enables students to develop an appreciation and understanding of biological concepts that are used to explore the diversity of life, from a molecular to a biological systems level, and the interactions between living things and the environments in which they live. Through applying Working Scientifically skills processes and the use of biological technologies, the course aims to examine how biological practices are developed and used

### YEAR 11 COURSE OUTCOMES (from NESA)

A student –

- Develops and evaluates questions and hypotheses for scientific investigation
- Designs and evaluates investigations in order to obtain primary and secondary data and information
- Conducts investigations to collect valid and reliable primary and secondary data and information
- Selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media
- Analyses and evaluates primary and secondary data and information
- Solves scientific problems using primary and secondary data, critical thinking skills and scientific processes
- Communicates scientific understanding using suitable language and terminology for a specific audience or purpose
- Describes single cells as the basis for all life by analysing and explaining cells' ultrastructure and biochemical processes
- Explains the structure and function of multicellular organisms and describes how the coordinated activities of cells, tissues and organs contribute to macroscopic processes in organisms
- Describes biological diversity by explaining the relationships between a range of organisms in terms of specialisation for selected habitats and evolution of species
- Analyses ecosystem dynamics and the interrelationships of organisms within the ecosystem

### TOPICS COVERED

Year 11 Course

**Module 1** Cells as the Basis of Life

**Module 2** Organisation of Living

Things **Module 3** Biological

Diversity

**Module 4** Ecosystem Dynamics

**Plus, a minimum of one Depth Study**

Year 12 Course

**Module 5** Heredity

**Module 6** Genetic Change

**Module 7** Infectious Disease

**Module 8** Non-infectious Disease and Disorders

**Plus, a minimum of one Depth Study**

### ASSESSMENT

Assessment strategies may include:

- Examinations
- Open-ended investigations
- Research tasks
- Analysis of secondary information

### POTENTIAL CAREERS / REASONS TO CHOOSE THE COURSE

- Agricultural scientist
- Biochemist
- Medical researcher
- Environmental scientist
- Nurse
- Physician
- Veterinary nurse
- Farm hand
- Paramedic

# Chemistry

## COURSE DETAILS

<b>Hours</b>	240 hours
<b>Type</b>	Board Developed Course
<b>Duration</b>	2 years
<b>Unit Value</b>	2-unit Year 11 2-unit Year 12
<b>HSC Exam</b>	Yes
<b>ATAR</b>	Yes
<b>Exclusions</b>	None
<b>RECOGNITION</b>	Year 12 Qualification

## COURSE DESCRIPTION

The Chemistry Stage 6 Syllabus explores the structure, composition and reactions of and between all elements, compounds and mixtures that exist in the Universe. The discovery and synthesis of new compounds, the monitoring of elements and compounds in the environment, and an understanding of industrial processes and their applications to life processes are central to human progress and our ability to develop future industries and sustainability.

The course provides the foundation knowledge and skills required to study chemistry after completing school, and supports participation in a range of careers in chemistry and related interdisciplinary industries. It is an essential discipline that currently addresses and will continue to address our energy needs and uses, the development of new materials, and sustainability issues as they arise.

## AIMS

The study of Chemistry in Stage 6 enables students to develop an appreciation and understanding of materials and their properties, structures, interactions and related applications. Through applying Working Scientifically skills processes, the course aims to examine how chemical theories, models and practices are used and developed.

## YEAR 11 COURSE OUTCOMES (from NESA)

A student –

- develops and evaluates questions and hypotheses for scientific investigation
- designs and evaluates investigations in order to obtain primary and secondary data and information
- conducts investigations to collect valid and reliable primary and secondary data and information
- selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media
- analyses and evaluates primary and secondary data and information
- solves scientific problems using primary and secondary data, critical thinking skills and scientific processes
- communicates scientific understanding using suitable language and terminology for a specific audience or purpose
- describes single cells as the basis for all life by analysing and explaining cells' ultrastructure and biochemical processes
- explains the structure and function of multicellular organisms and describes how the coordinated activities of cells, tissues and organs contribute to macroscopic processes in organisms
- describes biological diversity by explaining the relationships between a range of organisms in terms of specialisation for selected habitats and evolution of species
- analyses ecosystem dynamics and the interrelationships of organisms within the ecosystem

## TOPICS COVERED

Year 11 Course

**Module 1** Properties and Structure of Matter

**Module 2** Introduction to Quantitative Chemistry

**Module 3** Reactive Chemistry

**Module 4** Drivers of Reactions

**Plus, a minimum of one Depth Study**

Year 12 Course

**Module 5** Equilibrium and Acid Reactions

**Module 6** Acid/base Reactions

**Module 7** Organic Chemistry

**Module 8** Applying Chemical Ideas

**Plus a minimum of one Depth Study**

## ASSESSMENT

- Assessment strategies may include:
- Examinations
- Open-ended investigations
- Research tasks
- Analysis of secondary information

## POTENTIAL CAREERS / REASONS TO CHOOSE THE COURSE

- Pharmacist
- Chemical Engineer
- Toxicologist
- Physician
- Specialist Nurse
- Teacher
- Oceanographer
- Forensic scientist

# Investigating Science

## COURSE DETAILS

<b>Hours</b>	240 hours
<b>Type</b>	Board Developed Course
<b>Duration</b>	2 years
<b>Unit Value</b>	2-unit Year 11 2-unit Year 12
<b>HSC Exam</b>	Yes
<b>ATAR</b>	Yes
<b>Exclusions</b>	None
<b>RECOGNITION</b>	Year 12 Qualification

## COURSE DESCRIPTION

The Investigating Science Stage 6 course is designed to assist students of all abilities engage with scientific processes, and apply those processes to investigate relevant personal, community and global scientific issues.

Investigating Science encourages the development of a range of capabilities and capacities that enhance a student's ability to participate in all aspects of community life and within a fast-changing technological landscape. The knowledge, understanding and skills gained from this course are intended to support students' ongoing engagement with science, and to form the foundation for further studies and participation in current and emerging STEM-related post-school activities and industries.

## AIMS

The study of Investigating Science in Stage 6 enables students to develop an appreciation and understanding of science as a body of knowledge and a set of valuable processes that provide humans with an ability to understand themselves and the world in which they live. Through applying Working Scientifically skills processes, the course aims to enhance students' analytical and problem-solving skills, in order to make evidence-based decisions and engage with and positively participate in an ever-changing, interconnected technological world.

## YEAR 11 COURSE OUTCOMES (from NESA)

A student –

- Develops and evaluates questions and hypotheses for scientific investigation
- Designs and evaluates investigations in order to obtain primary and secondary data and information
- Conducts investigations to collect valid and reliable primary and secondary data and information
- Selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media
- Analyses and evaluates primary and secondary data and information
- Solves scientific problems using primary and secondary data, critical thinking skills and scientific processes
- Communicates scientific understanding using suitable language and terminology for a specific audience or purpose
- Identifies that the collection of primary and secondary data initiates scientific investigations
- Examines the use of inferences and generalisations in scientific investigations
- Develops, and engages with, modelling as an aid in predicting and simplifying scientific objects and processes
- Describes and assesses how scientific explanations, laws and theories have developed

## TOPICS COVERED

Year 11 Course

**Module 1** Cause and Effect – Observing

**Module 2** Cause and Effect – Inferences and Generalisations

**Module 3** Scientific Models

**Module 4** Theories and Laws

**Plus, a minimum of one Depth Study**

Year 12 Course

**Module 5** Scientific Investigations

**Module 6**

Technologies **Module**

**7** Fact or Fallacy?

**Module 8** Science and

Society

**Plus, a minimum of one Depth Study**

## ASSESSMENT

Assessment strategies may include:

- Examinations
- Open-ended investigations
- Research tasks
- Analysis of secondary information

## POTENTIAL CAREERS / REASONS TO CHOOSE COURSE

- Enrolled nurse
- Environmental field officer
- Farm manager
- Laboratory technician
- Nursery worker
- Land rehabilitation
- Pharmacy assistant

# Physics

## COURSE DETAILS

<b>Hours</b>	240 hours
<b>Type</b>	Board Developed Course
<b>Duration</b>	2 years
<b>Unit Value</b>	2-unit Year 11 2-unit Year 12
<b>HSC Exam</b>	Yes
<b>ATAR</b>	Yes
<b>Exclusions</b>	None
<b>RECOGNITION</b>	HSC Qualification

## COURSE DESCRIPTION

The Physics Stage 6 course involves the study of matter and its motion through space and time, along with related concepts that include energy and force. Physics deals with the study of phenomena on scales of space and time – from nuclear particles and their interactions up to the size and age of the Universe. This allows students to better understand the physical world and how it works, appreciate the uniqueness of the Universe, and participate in navigating and influencing the future.

The study of physics provides the foundation knowledge and skills required to support participation in a range of careers. It is a discipline that utilises innovative and creative thinking to address new challenges, such as sustainability, energy efficiency and the creation of new materials.

## AIMS

The study of Physics in Stage 6 aims to enable students to develop an appreciation and understanding of the application of the principles of physics, and of the theories, laws, models, systems and structures of physics. It also enables students to apply Working Scientifically skills processes to examine physics models and practices and their applications

## YEAR 11 COURSE OUTCOMES (from NESA)

A student –

- Develops and evaluates questions and hypotheses for scientific investigation
- Designs and evaluates investigations in order to obtain primary and secondary data and information
- Conducts investigations to collect valid and reliable primary and secondary data and information
- Selects and processes appropriate qualitative and quantitative data and information using a range of appropriate media
- Analyses and evaluates primary and secondary data and information
- Solves scientific problems using primary and secondary data, critical thinking skills and scientific processes
- Communicates scientific understanding using suitable language and terminology for a specific audience or purpose
- Describes and analyses motion in terms of scalar and vector quantities in two dimensions and makes quantitative measurements and calculations for distance, displacement, speed velocity and acceleration
- Describes and explains events in terms of Newton's laws of motion, the law of conservation of momentum and the law of conservation of energy
- Explains and analyses waves and the transfer of energy by sound, light and thermodynamic principles
- Explains and quantitatively analyses electric fields, circuitry and magnetism

## TOPICS COVERED

Year 11 Course

**Module 1** Kinematics

**Module 2** Dynamics

**Module 3** Waves and

Thermodynamics **Module 4**

Electricity and Magnetism

**Plus a minimum of one**

**Depth Study**

Year 12 Course

**Module 5** Advanced

Mechanics **Module 6**

Electromagnetism

**Module 7** The Nature

of Light

**Module 8** From the Universe to the Atom

**Plus, a minimum of one Depth Study**

## ASSESSMENT

Assessment strategies may include:

- Examinations
- Open-ended investigations
- Research tasks
- Analysis of primary / secondary information

## POTENTIAL CAREERS / REASONS TO CHOOSE COURSE

- Geophysicist
- Electrical engineer
- Civil engineer
- Scientific researcher
- Metallurgist
- Computer engineer
- Radiographer