



Highfields State  
Secondary College

# Semester 1 Course Overview

**Faculty:** Science

**Subject:** Biology

**Year level:** 12

## Course Outline

Biology provides opportunities for students to engage with living systems. Students will learn valuable skills required for the scientific investigation of questions. In addition, they will become citizens who are better informed about the world around them and who have the critical skills to evaluate and make evidence-based decisions about current scientific issues.

It is characterised by a view of life as a unique phenomenon with fundamental unity. Living processes and systems have many interacting factors that make quantification and prediction difficult. An understanding of these processes and systems requires integration of many branches of knowledge. The syllabus objectives include:

- describe and explain scientific concepts, theories, models and systems and their limitations
- apply understanding of scientific concepts, theories, models and systems within their limitations
- analyse evidence
- interpret evidence
- investigate phenomena
- evaluate processes, claims and conclusions
- communicate understandings, findings, arguments and conclusions.

| Semester 1   |   |
|--|---|
| Unit 3: Biodiversity and the interconnectedness of life  | Unit 4: Heredity and continuity of life   |
| <p>This unit continues from year 11.</p> <p>In Unit 3, students explore the ways biology is used to describe and explain: the biodiversity within ecosystems; a range of biotic and abiotic components; species interactions; adaptations of organisms to their environment; principles of population dynamics; and how classification systems are used to identify organisms and aid scientific communication. An understanding of the structure of ecosystems, the processes involved in the movement of energy and matter in ecosystems and how environmental factors limit populations is essential to appreciate the dynamics, diversity and underlying unity of these systems. Students investigate the interactions within and between species, and the interactions between abiotic and biotic components of ecosystems. They also investigate how measurements of abiotic factors, population numbers, species diversity and descriptions of interactions between species can form the basis for spatial and temporal comparisons between ecosystems. They examine and analyse data collected from fieldwork to understand the interconnectedness of organisms, the physical environment and the impact of human activity</p> | <p>In Unit 4, students explore the ways biology is used to describe and explain the cellular processes and mechanisms that ensure the continuity of life. An understanding of the processes and mechanisms of how life on Earth has persisted, changed and diversified over the last 3.5 billion years is essential to appreciate the unity and diversity of life.</p> <p>Students investigate different factors that affect cellular processes and gene pools. They examine different patterns of inheritance and the genetic basis of the theory of evolution through natural selection to analyse the use of predictive models in decision-making.</p> <p>Contexts that could be investigated in this unit include DNA profiling, gene therapy and genetically modified organisms. Through the investigation of these contexts, students may explore the impact of the development of these technologies on future society.</p> <p>Participation in a range of experiments and investigations will allow students to progressively develop their suite of science inquiry skills while gaining an enhanced appreciation of patterns of inheritance and the effect of a variety of factors on gene pools. Collaborative experimental work also helps students to develop communication, interaction, character and management skills.</p> <p>Throughout the unit, students develop skills in modelling processes to describe and explain inheritance and population genetics.</p> |
| Assessment   |   |
| <b>IA1: Data test</b><br>This assessment focuses on the application of a range of cognitions to multiple provided items — questions, scenarios and problems.   | <b>IA3: Research Investigation</b><br>(Disseminated and due in semester two)  |

**IA2: Student experiment**

This assessment requires students to research a question or hypothesis through collection, analysis and synthesis of primary data.