

BIOLOGY

Unit 3

How Do Cells Maintain Life?

COURSE OUTLINE:

In this unit, students investigate the workings of the cell from several perspectives. Students explore the relationship between nucleic acids and proteins. They analyse the structure and function of nucleic acids as information molecules, gene structure and expression, and proteins as a diverse group of functional molecules. They also examine the biological consequences of manipulating the DNA molecule and applying biotechnologies. Students also explore the regulation and rate of biochemical pathways with reference to photosynthesis and cellular respiration. Students apply their knowledge through investigation of a selected case study, data analysis, and/or a bioethical issue.

AREAS OF STUDY:

- What is the role of nucleic acids and proteins in maintaining life?
- How are biochemical pathways regulated?

OUTCOMES:

On completion of this unit, students should be able to:

1. Analyse the relationship between nucleic acids and proteins, and evaluate how tools and techniques can be used and applied in the manipulation of DNA.
2. Analyse the structure and regulation of biochemical pathways in photosynthesis and cellular respiration, and evaluate how biotechnology can be used to solve problems related to the regulation of biochemical pathways.

ASSESSMENT:

See Unit 4

Unit 4

How Does Life Change and Respond to Challenges?

COURSE OUTLINE:

In this unit students consider the continual change and challenges to which life on Earth has been, and continues to be, subjected to. They study the human immune system and the interactions between its components to provide immunity to a specific pathogen. Students consider how the application of biological knowledge can be used to respond to bioethical issues and challenges related to disease.

AREAS OF STUDY:

- How do organisms respond to pathogens?
- How are species related over time?
- How is scientific enquiry used to investigate cellular processes and/or biological change?

OUTCOMES:

On completion of this unit, students should be able to:

1. Analyse the immune response to specific antigens, compare the different ways that immunity may be acquired and evaluate challenges and strategies in the treatment of disease.
2. Analyse the evidence for genetic changes in populations and changes in species over time, analyse the evidence for relatedness between species, and evaluate the evidence for human change over time.
3. Design and conduct a scientific investigation related to cellular processes and/or how life changes and responds to challenges, and present an aim, methodology and methods, results, discussion and a conclusion in a scientific poster.

ASSESSMENT:

S or N based on the demonstrated achievement of the outcomes specified for the unit. Units 3 & 4 Coursework will contribute 40% to the final assessment. The end-of-year examination will contribute 60% to the final assessment.