

BIOS 0003 FOCUS ON BIOLOGY (WSTC)

Credit Points 10

Legacy Code 900104

Coordinator Virginia Shepherd ([https://directory.westernsydney.edu.au/search/name/Virginia Shepherd/](https://directory.westernsydney.edu.au/search/name/Virginia%20Shepherd/))

Description Biology is the study of integrated living systems, from the level of molecular systems that constitute cells to the interactions that occur within and between organisms that together make up the biosphere. This subject will equip students to undertake tertiary level biological subjects that emphasise both the unity (cell biology) and diversity (evolution) of living organisms. Students will learn about the basic molecular biological underpinnings of cellular structure and function within an integrated framework that proceeds through major themes of bioenergetics, gas exchange and transport systems within multicellular organisms, inheritance and evolution. Students will develop a fundamental body of essential biological concepts, as well as build skills in collecting and analysing information, and writing coherent explanations.

School Western Sydney The College

Student Contribution Band HECS Band 2 10cp

Check your fees via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 0 Preparatory subject

Equivalent Subjects BIOS 0002 - Focus on Biology (UWSCFS)

Restrictions

Students must be enrolled at The College in Foundation Studies programs.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Conceptualise and describe fundamental properties of living systems.
2. Recall the basic structural organisation of prokaryotic and eukaryotic cells.
3. Explain fundamental cellular processes including membrane transport, photosynthesis and respiration.
4. Explain the basic roles of nucleic acids, proteins, carbohydrates and lipids in cell structure and function.
5. Describe and explain the necessity for processes of gas exchange in multicellular organisms.
6. Describe and explain the necessity for transport systems in multicellular organisms.
7. Describe the manner in which genetic information is passed from generation to generation.
8. Outline at a basic level the process of protein synthesis from a DNA template.
9. Explain in simple terms the concept of evolution through natural selection and changes in gene frequency.
10. Describe basic characteristics of six kingdoms of life within an evolutionary framework.

11. Solve problems, analyse and synthesise information, and draw conclusions.

Subject Content

Topic 1

Cells: The Basis of Life

Characteristics of living systems

Prokaryotes and eukaryotes

Organisation, structure and function of cells

Overview of evolution of eukaryotic cells

Emergence of multicellularity

Topic 2

Cells in Action

Life's building blocks: proteins, nucleic acids, lipids and carbohydrates

Maintaining a boundary: cell membranes and membrane transport, compartmentalisation of eukaryotic cells

Energising the biosphere: chloroplasts and photosynthesis

Fuel for life: mitochondria, cellular respiration, and ATP

Topic 3

Life on Land: Gas Exchange in Multicellular Organisms

Gas exchange systems in multicellular organisms: overview of evolution

Stomata, guard cells and transpiration

The mammalian respiratory system

Topic 4

Life on Land: Transport Systems in Multicellular Organisms

Transport systems in multicellular organisms: overview of evolution

Roots and shoots, xylem and phloem: transport in flowering plants

The mammalian circulatory and excretory systems

Topic 5

Reproduction and Inheritance

DNA, genes, and chromosomes

Protein synthesis

Cell division in eukaryotes

Aspects of Mendelian Inheritance

Topic 6

Evolution and Biodiversity

Natural selection, changes of gene frequency in populations

Phylogeny: six kingdoms, three domains of life

Themes in evolution

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task
Log/ Workbook — workbook problems 1	a. Quiz: up to 30 min b. Participation	20	N	Individual
Intra-session Exam 2	1 hour	15	N	Individual
Practical — Laboratory workbook 3	a.1 hour b. Quiz: up to 30 min	30	N	Individual
Quiz-Living Systems	30 min	10	N	Individual
End of Session Exam	2 hrs and 20 mins	25	N	Individual