

BIOS 0002 FOCUS ON BIOLOGY (WSTC PREP)

Credit Points 10

Legacy Code 700232

Coordinator Anne Bertoldo (<https://directory.westernsydney.edu.au/search/name/Anne Bertoldo/>)

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

Discipline Biological Sciences, Not Elsewhere Classified.

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 0003 - Focus on Biology (WSTC) BIOS 0001 - Biology

Restrictions

Students must be enrolled at Western Sydney University, The College.

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
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- 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:

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		20	N	
Intra-session Exam		25	N	

Practical	30	N
Final Exam	25	N

Teaching Periods

Term 1 (2024)

Nirimba Education Precinct

On-site

Subject Contact Virginia Shepherd (<https://directory.westernsydney.edu.au/search/name/Virginia Shepherd/>)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=BIOS0002_24-T1_BL_1#subjects)

Term 3 (2024)

Nirimba Education Precinct

On-site

Subject Contact Virginia Shepherd (<https://directory.westernsydney.edu.au/search/name/Virginia Shepherd/>)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=BIOS0002_24-T3_BL_1#subjects)