BIOS 2042 BIOCHEMISTRY

Credit Points 10

Legacy Code 301460

Coordinator Roland Gamsjaeger (https://directory.westernsydney.edu.au/search/name/Roland Gamsjaeger/)

Description Biochemistry is the study of the chemistry of life. By understanding the structure and roles of biological macromolecules found in cells students will develop the concept of self assembly of these molecules to form life. Topics include the structure of carbohydrates, lipids, proteins, and nucleic acids and how they function in the lipid and aqueous environments of the cell. Basic metabolism is introduced with an overview of the major pathways in cells, mechanisms of regulation, and an introduction into important cofactors and intermediatory molecules. These concepts will be reinforced through practical classes that teach critical skills in experimental design, analysis and interpretation.

School Science

Discipline Biochemistry and Cell Biology

Student Contribution Band HECS Band 2 10cp

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

Level Undergraduate Level 2 subject

Pre-requisite(s) CHEM 1012 Essential Chemistry

Restrictions

Successful completion of 60 credit points

Learning Outcomes

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

1. Identify and explain biologically important chemical bonds and functional groups and describe their interaction.
2. Recognise and describe the structure of monomeric units of major biomolecules in a cell.
3. Explain how complex biomolecules form through polymerisation, chemical modification or aggregation of these monomeric units form complex functional or structural molecules.
4. Discuss key metabolic processes, their control and cellular location.
5. Relate different biomolecules to different cellular structures and processes.
6. Handle biomolecules for analysis in a laboratory.
7. Collect, record and analyse laboratory data in a lab book consistent with legal standards.
8. Be able to perform basic biochemical calculations (mole calculations, dilutions, unit conversion, standard curve and basic enzymatic calculations).
9. Work as a member of a group.

Subject Content

1. Overview of Biochemistry
- The cell, groups of important biomolecules, bonds, Functional groups, genes to proteins
- The aqueous environment
2. Biomolecules - Lipids
- The Chemistry and structure of fatty acids
- Membranes: phospholipids and glycolipids
3. Biomolecules - Introduction to Carbohydrates and Glycobiology
- The Chemistry and nomenclature of mono, di and polysaccharides
- Heteropolysaccharides: cellulose, starch, glycogen and The extracellular matrix
4. Biomolecules - Nucleic acids
- Ribose, deoxyribose, phosphodiester bonds, bases
- structural differences between RNA and DNA
5. Biomolecules - Proteins
- Amino acids: functional groups; acid base properties; symbols
- structure of proteins: peptide bonds, protein folding, pictorial representation of protein structure
- Classification and functions of proteins
- protein Packaging and post translational modification
- protein degradation
6. Introduction to metabolism
- Overview of anabolic and catabolic pathways and their regulation
- Characteristics of enzymes: active sites; catalytic principles; Basic enzyme kinetics
- introduction to important branch Point, High energy compounds and co-Factors
7. Quantitative aspects of Biochemistry
- handling and Analysing biomolecules in A laboratory
- developing independence in data organisation, recording and calculations
- maintaining A legal Standard laboratory note book

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
Final Exam	2 hours	50	N	Individual
Report	Max 500 words	10	N	Individual
Practical	Throughout semester	20	N	Individual
Quiz	Throughout semester	20	N	Individual

Prescribed Texts

- Biochemistry: A Short Course, 3rd Edition, by John L. Tymoczko, Jeremy M. Berg and Lubert Stryer

Teaching Periods

Summer A (2022)
Online
Online
Subject Contact Roland Gamsjaeger (https://directory.westernsydney.edu.au/search/name/Roland Gamsjaeger/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=BIOS2042_22-SUA_ON_O#subjects)

Autumn (2022)

Campbelltown

Day
Subject Contact Roland Gamsjaeger (https://directory.westernsydney.edu.au/search/name/Roland Gamsjaeger/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=BIOS2042_22-AUT_CA_D#subjects)

Hawkesbury

Day
Subject Contact Roland Gamsjaeger (https://directory.westernsydney.edu.au/search/name/Roland Gamsjaeger/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=BIOS2042_22-AUT_HW_D#subjects)

Parramatta - Victoria Rd

Day
Subject Contact Roland Gamsjaeger (https://directory.westernsydney.edu.au/search/name/Roland Gamsjaeger/)

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=BIOS2042_22-AUT_PS_D#subjects)

Autumn (2023)

Campbelltown

On-site
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View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=BIOS2042_23-AUT_CA_1#subjects)

Hawkesbury

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Parramatta - Victoria Rd

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