

Unit Outline (Higher Education)

Institute / School: Institute of Innovation, Science & Sustainability

Unit Title: Biochemistry

Unit ID: SCBCH2001

Credit Points: 15.00

Prerequisite(s): (SCBIO1001 and SCCHM1001) OR (SCCHM1002)

Co-requisite(s): Nil

Exclusion(s): Nil

ASCED: 010901

Description of the Unit:

This unit will provide students with foundation studies in the principles of biochemistry, providing the skills and knowledge to support more advanced studies. The unit begins with an introduction to the cellular environment and considers the interactions that stabilise biological macromolecules. This is followed by studying: the structure and function of proteins and enzymes and techniques for their isolation and purification; the composition of biological membranes; the structure of nucleic acids and their packaging within cells; mechanisms for synthesis, modification and turnover of nucleic acids and proteins.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

Work Experience:

No work experience

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment.

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory	■	■	■	■	■	■
Intermediate	■	■	✓	■	■	■
Advanced	■	■	■	■	■	■

Learning Outcomes:

Knowledge:

- K1.** Describe the structures of biological molecules and their roles in biological processes.
- K2.** Discuss the relationship between structure and function of macromolecules, with a particular emphasis on proteins.
- K3.** Describe the role of enzymes as catalysts in biological systems and explain mechanisms for control of enzyme activity.
- K4.** Discuss the buffering mechanisms that operate in biological systems.
- K5.** Describe analytical methods suitable for the assay of biological molecules.

Skills:

- S1.** Analyse and interpret laboratory data.
- S2.** Locate, interpret, evaluate and communicate biochemical information.

Application of knowledge and skills:

- A1.** Select appropriate strategies for the isolation and purification of proteins from biological samples.
- A2.** Predict the functional outcome of mutations and substitutions at the molecular level.
- A3.** Critically evaluate scientific data.

Unit Content:

- The cellular environment; maintenance of pH.
- Small molecules as building blocks: Sugars and polysaccharides; Fatty acids and complex lipids; Amino acids and proteins; Nucleotides and nucleic acids.
- Protein structure and function: primary, secondary, tertiary and quaternary structure of proteins; factors that affect protein activity; structure-function relationships.
- Enzymes: activity, kinetics, regulation and applications.
- Strategies for isolation and assay of biological molecules.
- Cellular membranes: dynamic behaviour of cell membranes; transport of molecules and ions across membranes.
- Storage and transfer of biological information; packaging of nucleic acids within cells.
- Degradation and turnover of biological molecules.

FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**tttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be*

evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 1 Interpersonal	Students will demonstrate the ability to effectively communicate, inter-act and work with others both individually and in groups. Students will be required to display skills in-person and/or online in: <ul style="list-style-type: none"> Using effective verbal and non-verbal communication Listening for meaning and influencing via active listening Showing empathy for others Negotiating and demonstrating conflict resolution skills Working respectfully in cross-cultural and diverse teams. 	Not applicable	Not applicable
FEDTASK 2 Leadership	Students will demonstrate the ability to apply professional skills and behaviours in leading others. Students will be required to display skills in: <ul style="list-style-type: none"> Creating a collegial environment Showing self-awareness and the ability to self-reflect Inspiring and convincing others Making informed decisions Displaying initiative 	Not applicable	Not applicable
FEDTASK 3 Critical Thinking and Creativity	Students will demonstrate an ability to work in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: <ul style="list-style-type: none"> Reflecting critically Evaluating ideas, concepts and information Considering alternative perspectives to refine ideas Challenging conventional thinking to clarify concepts Forming creative solutions in problem solving. 	Not applicable	Not applicable
FEDTASK 4 Digital Literacy	Students will demonstrate the ability to work fluently across a range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: <ul style="list-style-type: none"> Finding, evaluating, managing, curating, organising and sharing digital information Collating, managing, accessing and using digital data securely Receiving and responding to messages in a range of digital media Contributing actively to digital teams and working groups Participating in and benefiting from digital learning opportunities. 	Not applicable	Not applicable

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 5 Sustainable and Ethical Mindset	Students will demonstrate the ability to consider and assess the consequences and impact of ideas and actions in enacting ethical and sustainable decisions. Students will be required to display skills in: <ul style="list-style-type: none"> • Making informed judgments that consider the impact of devising solutions in global economic environmental and societal contexts • Committing to social responsibility as a professional and a citizen • Evaluating ethical, socially responsible and/or sustainable challenges and generating and articulating responses • Embracing lifelong, life-wide and life-deep learning to be open to diverse others • Implementing required actions to foster sustainability in their professional and personal life. 	Not applicable	Not applicable

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K4, S1, S2, A1, A3	Data analysis and evaluation	Workshop and tutorial activity reports	20-30%
K1, K2, K5, S2, A1, A2, A3	Research and reporting on a specified topic in biochemistry	Written assignment	15-25%
K1, K2, K3, K4, K5	Recall and comprehension of fundamental concepts	On-line quizzes	5-20%
K1, K2, K3, K4, K5, S1, A1, A2	Written response	Test	40-60%

Adopted Reference Style:

APA ()

Refer to the [library website](#) for more information

Fed Cite - [referencing tool](#)