

Course Outline (Higher Education)

School: School of Science, Psychology and Sport

Course Title: BIOCHEMISTRY

Course ID: SCBCH2001

Credit Points: 15.00

Prerequisite(s): (SCBIO1001 or SCBIO1010) (SCCHM1002)

Co-requisite(s): Nil

Exclusion(s): (BTHGC2741 and SCBIO2053)

ASCED: 010901

Description of the Course:

This course will provide students with foundation studies in the principles of biochemistry, providing the skills and knowledge to support more advanced studies. The course 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: Student is not undertaking work experience in industry.

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the course but gained a final mark of 45 per cent or above and submitted all major assessment tasks.

Program Level:

Level of course in Program	AQF Level of Program					
	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.

Course Content:

Topics may include:

- 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.

Graduate Attributes

The Federation University Federation graduate attributes (GA) are entrenched in the [Higher Education Graduate Attributes Policy](#) (LT1228). FedUni graduates develop these graduate attributes through their engagement in explicit learning and teaching and assessment tasks that are embedded in all FedUni programs. Graduate attribute attainment typically follows an incremental development process mapped through program progression. **One or more graduate attributes must be evident in the specified learning outcomes and assessment for each FedUni course, and all attributes must be directly assessed in each program**

Graduate attribute and descriptor		Development and acquisition of GAs in the course	
		Learning Outcomes (KSA)	Assessment task (AT#)
GA 1 Thinkers	Our graduates are curious, reflective and critical. Able to analyse the world in a way that generates valued insights, they are change makers seeking and creating new solutions.	K1, K3, K5, S1, S2, A1, A2, A3	AT1, AT2
GA 2 Innovators	Our graduates have ideas and are able to realise their dreams. They think and act creatively to achieve and inspire positive change.	K5, S1, A1, A2, A3	AT1
GA 3 Citizens	Our graduates engage in socially and culturally appropriate ways to advance individual, community and global well-being. They are socially and environmentally aware, acting ethically, equitably and compassionately.	Not applicable	Not applicable
GA 4 Communicators	Our graduates create, exchange, impart and convey information, ideas, and concepts effectively. They are respectful, inclusive and empathetic towards their audience, and express thoughts, feelings and information in ways that help others to understand.	S2, A3	AT2, AT4
GA 5 Leaders	Our graduates display and promote positive behaviours, and aspire to make a difference. They act with integrity, are receptive to alternatives and foster sustainable and resilient practices.	Not applicable	Not applicable

Learning Task and Assessment:

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

Adopted Reference Style:

Australian Harvard

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

Fed Cite - [referencing tool](#)