



Course Outline (Higher Education)

School:	School of Science, Psychology and Sport
Course Title:	ADVANCED METHODS IN BIOTECHNOLOGY
Course ID:	SCMOL3010
Credit Points:	15.00
Prerequisite(s):	(SCMOL2001) (SCBCH2001 or SCMIC2001 or SCMOL2010)
Co-requisite(s):	Nil
Exclusion(s):	Nil
ASCED:	019909

Description of the Course:

This course will introduce students to advanced methods and techniques that are used in contemporary biological and biomedical laboratories. Course content will be dynamic reflecting the learning needs of students enrolled in biological and biomedical programs and relevant to industry and research. The methods covered in this course have diverse applications, including research, disease diagnosis, environmental analysis and industry; and can be used in all fields of biomedicine, biotechnology and biology. A major focus of this course is on the development of understanding of the use of molecular techniques to achieve desired experimental outcomes, practical skills and the application of methods and techniques. This approach will lay the foundation for students to continue to understand and develop new methods and techniques in the future.

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

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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intermediate	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advanced	<input type="checkbox"/>	<input type="checkbox"/>	✓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Learning Outcomes:

On successful completion of the course the students are expected to be able to:

Knowledge:

- K1.** Understand basic scientific concepts underpinning techniques in advanced biotechnology methods.
- K2.** Describe in detail the use of advanced biotechnological methods and compare/contrast their applicability to conventional/classical methods.
- K3.** Understand the importance of quality control and statistical validity of sampling in the application of advanced techniques to address different real world problems.
- K4.** Determine and justify the use of specific biotechnological methods for use in a range of medical, research and industrial applications.

Skills:

- S1.** Demonstrate proficiency in a variety of contemporary laboratory techniques.
- S2.** Develop scientific problem-solving and investigation skills.
- S3.** Collection, evaluation and interpretation of laboratory data.
- S4.** Analysis of laboratory generated data, including large datasets.
- S5.** Communication of scientific concepts, results and conclusions.

Application of knowledge and skills:

- A1.** Determine appropriate methodological approaches under specific circumstances representative of those encountered in industrial, diagnostic and research applications.
- A2.** Apply problem solving skills and methodological theory to troubleshoot techniques and procedures.
- A3.** Analyse and interpret data and draw appropriate conclusions.

Course Content:

The course content will be reviewed annually to ensure content:

- Reflects the learning needs of students enrolled in biological and biomedical programs within the faculty, such as the BSc and tagged degree programs including Veterinary and Wildlife Science, Biomedical Science, and Food and Nutrition.
- Remains highly relevant to industry and research.
- Lays the foundation, as much as practicable and predictable, for students to continue to understand new methods and techniques as they develop in the future.

As such, the course content will be dynamic rather than static. Broadly however, the topics covered in the course are likely to cover:

- The development of contemporary biotechnological methods and techniques.
- The current and potential future application of contemporary biotechnological methods and techniques; and why they are used in such applications.
- Conduct laboratory work and data analyses consistent with the current applications of advanced biotechnological methods.
- Generate, collate, evaluate and interpret experimental results.

Values:

- V1.** Experience the excitement of discovery in scientific research.

- V2.** Appreciate the need for scientific communication in various formats.
- V3.** Appreciate the need for individual and team-based work and its application in the workplace.
- V4.** Adoption of a respectful and courteous manner to colleagues.
- V5.** Appreciate the need to remain up-to-date with technical developments in biological and biomedical sciences.
- V6.** Further development of autonomous learning habits.

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, K4, S2, S4, A1, A3	AT1 AT2 AT3
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.	K4, S1, S2, S3, S4, A1, A2, A3	AT1 AT2 AT3
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.	K3, K4, S4, S5, A1, A3	AT1 AT2 AT3
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.	K2, K4, S4, S5, A3	AT1 AT2 AT3
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.	K3, K4, S1, S2, S5, A1, A2, A3	AT1 AT2 AT3

Learning Task and Assessment:

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1, K3, K4, S2, S4, A1, A3	AT1: Assessed Task 1: Assessment of understanding of the practice and application of molecular techniques.	Quizzes (online and/or written)	10 - 30%
K1, K2, S2, S4, S5, A2, A3	AT2: Assessed Task 2: A written assignment and / or presentation outlining the application of a technique, data collection and interpretation of results. May include a formal laboratory practical report or data analysis.	Written Assignment / Presentation	40 - 60%

Learning Outcomes Assessed	Learning Tasks	Assessment Type	Weighting
K1-K4, S2, S4, S5, A1, A3	AT3: Assessed task 3: Laboratory logbook and professionalism. Proven ability to document experiments and results as well as maintain an orderly lab space.	Laboratory notebook and professionalism	10 - 20%

Adopted Reference Style:

Australian Harvard

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

Fed Cite - [referencing tool](#)