UNSW Course Outline

BABS1202 Applied Biomolecular Sciences - 2024

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General Course Information

Course Code : BABS1202
Year : 2024
Term : Term 2
Teaching Period : T2
Is a multi-term course? : No
Faculty : Faculty of Science
Academic Unit : School of Biotechnology and Biomolecular Sciences
Delivery Mode : Multimodal
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

This course introduces the application of biomolecular science across the areas of microbiology, molecular cell biology, genetics, biotechnology and bioinformatics. Topics include recombinant DNA technology, bioremediation, genomics, and applications such as brewing, biofuels, and

vaccines.

The key concepts of these areas are introduced along with examples of their application in research and industry, such as recombinant DNA technologies and bioprocessing. Skills and techniques fundamental to these areas are introduced and practiced in the laboratory, including pipetting, aseptic technique, bacterial subculture, serial dilutions, the Gram stain, bacterial transformation, PCR, agarose gel electrophoresis and bioinformatics.

Course Aims

The course aims to provide a foundation to the areas of microbiology, molecular cell biology, genetics, biotechnology and bioinformatics. This is done by introducing the key concepts and applications of these areas, and practicing fundamental laboratory skills and techniques.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Explain key concepts and describe applications of the biosciences in the areas of microbiology, molecular cell biology, genetics, biotechnology and bioinformatics.
CLO2 : Demonstrate a knowledge of the skills, techniques, experimental design and safe work practices of a bioscience laboratory, including fundamental microbiology, recombinant DNA and bioinformatics techniques.
CLO3 : Effectively communicate experimental results and findings from scientific literature using appropriate referencing to different audiences.
CLO4 : Demonstrate quantitative skills applicable to the biosciences, including serial dilutions, metric conversions, biochemical calculations data collection and organisation, graphing, and experimental design.

Course Learning Outcomes	Assessment Item
CLO1 : Explain key concepts and describe applications of the biosciences in the areas of microbiology, molecular cell biology, genetics, biotechnology and bioinformatics.	• Mid-Term Test • Final Exam
CLO2 : Demonstrate a knowledge of the skills, techniques, experimental design and safe work practices of a bioscience laboratory, including fundamental microbiology, recombinant DNA and bioinformatics techniques.	• Practical Exam • Laboratory Report • Mid-Term Test • Final Exam
CLO3 : Effectively communicate experimental results and findings from scientific literature using appropriate referencing to different audiences.	• Laboratory Report
CLO4 : Demonstrate quantitative skills applicable to the biosciences, including serial dilutions, metric conversions, biochemical calculations data collection and organisation, graphing, and experimental design.	• Practical Exam • Mid-Term Test • Laboratory Report • Final Exam

Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Mid-Term Test Assessment Format: Individual	25%	Start Date: Not Applicable Due Date: Week 7
Practical Exam Assessment Format: Individual	20%	Start Date: Not Applicable Due Date: Week 9
Laboratory Report Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: Week 10
Final Exam Assessment Format: Individual	25%	Start Date: Not Applicable Due Date: Not Applicable

Assessment Details

Mid-Term Test

Assessment Overview

You will complete a one-hour test in Week 7.It will cover content delivered in week 1 to 5.

The test will include multiple choice and short answer questions.

The mark and feedback will be provided via Moodle within 2 weeks of completing the test.

Course Learning Outcomes

- CLO1 : Explain key concepts and describe applications of the biosciences in the areas of microbiology, molecular cell biology, genetics, biotechnology and bioinformatics.
- CLO2 : Demonstrate a knowledge of the skills, techniques, experimental design and safe work practices of a bioscience laboratory, including fundamental microbiology, recombinant DNA and bioinformatics techniques.
- CLO4 : Demonstrate quantitative skills applicable to the biosciences, including serial dilutions, metric conversions, biochemical calculations data collection and organisation, graphing, and experimental design.

Assignment submission Turnitin type

Not Applicable

Practical Exam

Assessment Overview

The practical exam will consist of a series of practical tasks designed to assess the understanding and application of laboratory techniques introduced in the course. Throughout the duration of the course, students will have ample opportunities to learn and practice each of the assessed techniques before the exam, which will take place during each students enrolled

laboratory class in Week 9. The mark and feedback will be provided within 2 weeks of completing the exam.

Course Learning Outcomes

- CLO2 : Demonstrate a knowledge of the skills, techniques, experimental design and safe work practices of a bioscience laboratory, including fundamental microbiology, recombinant DNA and bioinformatics techniques.
- CLO4 : Demonstrate quantitative skills applicable to the biosciences, including serial dilutions, metric conversions, biochemical calculations data collection and organisation, graphing, and experimental design.

Assignment submission Turnitin type

Not Applicable

Laboratory Report

Assessment Overview

You will write a laboratory report on the laboratory project you perform in class across Term to isolate, characterise and identify a microorganism. You will practice a range of laboratory techniques in the project and demonstrate your knowledge of experimental design, data collection, data organisation and scientific communication in writing a report on your project and its results.

Support for this assessment is provided as a lecture on report writing.

This assignment is due in Week 10.

Written feedback and a completed rubric is provided two weeks following submission.

Course Learning Outcomes

- CLO2 : Demonstrate a knowledge of the skills, techniques, experimental design and safe work practices of a bioscience laboratory, including fundamental microbiology, recombinant DNA and bioinformatics techniques.
- CLO3 : Effectively communicate experimental results and findings from scientific literature using appropriate referencing to different audiences.
- CLO4 : Demonstrate quantitative skills applicable to the biosciences, including serial dilutions, metric conversions, biochemical calculations data collection and organisation, graphing, and experimental design.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Final Exam

Assessment Overview

Your final exam will be centrally timetabled within a 2-hour timeslot during the UNSW examination period. The exam covers all course content delivered in weeks 7-10, including the lectures and laboratories. The exam comprises multiple choice and short answer. Feedback is available through inquiry with the course convenor.

Course Learning Outcomes

- CLO1 : Explain key concepts and describe applications of the biosciences in the areas of microbiology, molecular cell biology, genetics, biotechnology and bioinformatics.
- CLO2 : Demonstrate a knowledge of the skills, techniques, experimental design and safe work practices of a bioscience laboratory, including fundamental microbiology, recombinant DNA and bioinformatics techniques.
- CLO4 : Demonstrate quantitative skills applicable to the biosciences, including serial dilutions, metric conversions, biochemical calculations data collection and organisation, graphing, and experimental design.

General Assessment Information

Further information on the assessments is provided in the Assessment Hub on Moodle. If you have any questions, please attend one of our Q&A session, post on the Moodle Forum or email BABS1202@unsw.edu.au

Grading Basis

Standard

Requirements to pass course

To pass this course you need a composite mark of at least 50.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 27 May - 2 June	Lecture	Lecture 1: Course Introduction
	Lecture	Lecture 2: Microbial Life
	Lecture	Lecture 3: Microbial Metabolism
Week 2 : 3 June - 9 June	Lecture	Lecture 4: Microbial Death
	Lecture	Lecture 5: Microbial Diversity
	Lecture	Lecture 6: Bioremediation
	Laboratory	Lab 1: Microbiological Techniques
Week 3 : 10 June - 16 June	Lecture	Lecture 7: Industrial Enzymes
	Lecture	Lecture 8: Biofuels
	Laboratory	Lab 2: Characterisation of bacteria – Gram stain
Week 4 : 17 June - 23 June	Lecture	Lecture 9: Laboratory Report Assessment
	Lecture	Lecture 10: Bioprocesses
	Lecture	Lecture 11: Brewing
	Laboratory	Lab 3: Spectrophotometry
Week 5 : 24 June - 30 June	Lecture	Lecture 12: Medical Mycology and biotechnology
	Lecture	Lecture 13: Vaccines
	Lecture	Lecture 14: Revision
	Laboratory	Lab 4: Quantification of enzyme production and activity and Molecular identification of bacteria by gene sequencing
Week 7 : 8 July - 14 July	Assessment	Mid-term Exam
	Lecture	Lecture 15: Genetic Recombination 1
	Lecture	Lecture 16: Genetic Recombination 2
	Laboratory	Lab 5: Gel electrophoresis of alpha-amylase PCR products and Semi-quantification of enzyme production & activity
Week 8 : 15 July - 21 July	Lecture	Lecture 17: Genetic Recombination 3
	Lecture	Lecture 18: Genetic Recombination 4
	Lecture	Lecture 19: CRISPR
	Laboratory	Lab 6: Quantification of secreted (cell free) enzyme production and activity
Week 9 : 22 July - 28 July	Lecture	Lecture 20: Bioinformatics- Concepts, Tooks and Databases
	Lecture	Lecture 21: Genomics- Concepts and Sequencing
	Lecture	Lecture 22: Genome sequencing
	Laboratory	Lab 7: Quantification of secreted (cell free) enzyme production and activity
	Assessment	Practical Exam
Week 10 : 29 July - 4 August	Lecture	Lecture 23: Astrobiology
	Lecture	Lecture 24: Final exam revision
	Laboratory	Lab 8: Molecular bioinformatics computer tutorial for identification of your unknown bacterial isolates
	Assessment	Laboratory Report

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

General Schedule Information

Your attendance is expected for all laboratory classes.

If you are unable to attend a laboratory class, please email BABS1202@unsw.edu.au providing the reasons you need a make up activity. For laboratory classes, students are required to: Arrive on time and prepared for the class (correct PPE of laboratory coat, safety glasses and closed shoes, and a device to access the online Class Notebook), and actively participate in the activities. We will have some additional devices available on request, please email the above address prior with details of your class.

Course Resources

Prescribed Resources

There is no laboratory manual for purchase. The laboratory classes use the Class Notebook (OneNote) which is introduced in the first lecture and accessible via the course Teams site.

Recommended Resources

Lisa A. Urry, Noel Meyers, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky. 12th edition, **Campbell Biology Australian and New Zealand version**. This is available in either print https://www.bookshop.unsw.edu.au/details.cgi?ITEMNO=9781488626241 and electronic format https://unswbookshop.vitalsource.com/products/-v9781488626272

Copies are also available in the UNSW Library (both print and electronic).

Additional Costs

A laboratory coat and safety glasses are required for this course.

Course Evaluation and Development

Student feedback on the course is collected via myExperience. Changes made to the course are reported back to students via myFeedback matters in the Quick Links section of the course Moodle page.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Teagan Mock				Please email for an appointment.	No	Yes
	Rebecca LeBard				Please email for an appointment.	No	No

Other Useful Information

Academic Information

Upon your enrolment at UNSW, you share responsibility with us for maintaining a safe, harmonious and tolerant University environment.

You are required to:

- Comply with the University's conditions of enrolment.
- Act responsibly, ethically, safely and with integrity.
- Observe standards of equity and respect in dealing with every member of the UNSW community.
- Engage in lawful behaviour.
- Use and care for University resources in a responsible and appropriate manner.
- Maintain the University's reputation and good standing.

For more information, visit the UNSW Student Code of Conduct Website.

Academic Honesty and Plagarism

Referencing is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism.
Further information about referencing styles can be located at https://student.unsw.edu.au/referencing

Academic integrity is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage. At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.
Further information about academic integrity, plagiarism and the use of AI in assessments can be located at:

- The Current Students site,
- The ELISE training site, and
- The Use of AI for assessments site.

The Student Conduct and Integrity Unit provides further resources to assist you to understand your conduct obligations as a student: https://student.unsw.edu.au/conduct

Submission of Assessment Tasks

Penalty for Late Submissions

UNSW has a standard late submission penalty of:

- 5% per day,
- for all assessments where a penalty applies,
- capped at five days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, and
- no permitted variation.

Any variations to the above will be explicitly stated in the Course Outline for a given course or assessment task.

Students are expected to manage their time to meet deadlines and to request extensions as early as possible before the deadline.

Special Consideration

If circumstances prevent you from attending/completing an assessment task, you must officially apply for special consideration, usually within 3 days of the sitting date/due date. You can apply by logging onto myUNSW and following the link in the My Student Profile Tab. Medical documentation or other documentation explaining your absence must be submitted with your application. Once your application has been assessed, you will be contacted via your student email address to be advised of the official outcome and any actions that need to be taken from there. For more information about special consideration, please visit: https://student.unsw.edu.au/special-consideration

Important note: UNSW has a "fit to sit/submit" rule, which means that if you sit an exam or submit a piece of assessment, you are declaring yourself fit to do so and cannot later apply for Special Consideration. This is to ensure that if you feel unwell or are faced with significant circumstances beyond your control that affect your ability to study, you do not sit an examination or submit an assessment that does not reflect your best performance. Instead, you should apply for Special Consideration as soon as you realise you are not well enough or are otherwise unable to sit or submit an assessment.

Faculty-specific Information

Additional support for students

- The Current Students Gateway
- Student Support
- Academic Skills and Support
- Student Wellbeing, Health and Safety
- Equitable Learning Services
- UNSW IT Service Centre
- Science EDI Student Initiatives, Offerings and Guidelines