



UNSW Course Outline

BABS3121 Molecular Biology of Nucleic Acids - 2024

Published on the 06 Feb 2024

General Course Information

Course Code : BABS3121

Year : 2024

Term : Term 1

Teaching Period : T1

Is a multi-term course? : No

Faculty : Faculty of Science

Academic Unit : School of Biotechnology and Biomolecular Sciences

Delivery Mode : In Person

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

The course provides a comprehensive overview of gene structure and function including structure and properties of polynucleotides such as DNA and RNA; structure of chromatin; mechanisms and regulation of gene replication, transcription and translation, DNA repair and the

molecular biology of cancer induction; recombinant DNA technology; nucleic acid sequencing, recombinant DNA technology and application of genomics and proteomics. Practical work provides extensive experience with contemporary molecular techniques; literature surveys and web-based research are also used to enhance the theoretical and practical aspects of the syllabus.

Course Aims

This course aims to provide students with a deeper understanding of gene structure and function, including topics such as DNA and RNA structure, chromatin organisation, and the regulation of gene replication, transcription, and translation, as well as more advanced molecular biology concepts. Through applied laboratory work, students will gain practical experience in contemporary molecular techniques, as well as an introduction to informatics-based methods from which students can pursue future work in industry or academia (including Honours projects). Weekly practical sessions are focused to provide exposure to procedures used in the routine manipulation and analysis of DNA and associated products (including RNA). This course complements and supports other BABS courses.

Relationship to Other Courses

This course syllabus builds on students' prior knowledge and skills gained in coursework offered by the School of BABS, in particular 'Principles of Molecular Biology (Advanced)' (BIOC2201).

The course is also highly recommended for students wishing to pursue an Honours project within the School of BABS in genetics, molecular and cell biology, or biotechnology.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Perform experimental analysis of gene expression at the mRNA level.
CLO2 : Apply theory and practical methods to the understanding of the molecular properties and functions of nucleic acids.
CLO3 : Critically evaluate scientific literature relevant to molecular biology.
CLO4 : Effectively communicate scientific content through scientific reports and presentations.

Course Learning Outcomes	Assessment Item
CLO1 : Perform experimental analysis of gene expression at the mRNA level.	<ul style="list-style-type: none">Laboratory Work
CLO2 : Apply theory and practical methods to the understanding of the molecular properties and functions of nucleic acids.	<ul style="list-style-type: none">Mid-Term TestRNA-Seq Analysis PresentationFinal Theory ExamLaboratory Work
CLO3 : Critically evaluate scientific literature relevant to molecular biology.	<ul style="list-style-type: none">Mid-Term TestRNA-Seq Analysis PresentationFinal Theory Exam
CLO4 : Effectively communicate scientific content through scientific reports and presentations.	<ul style="list-style-type: none">RNA-Seq Analysis Presentation

Learning and Teaching Technologies

Microsoft Teams | Moodle - Learning Management System

Learning and Teaching in this course

Throughout the course, students are encouraged to develop problem-solving skills and to critically evaluate concepts, ideas, and research results by participating in all face-to-face activities such as practical classes, attending the online live lectures, and posting course content queries in the Moodle Discussion Forums. Also, online learning materials will be made available to further assist students' learning.

Lectures serve to emphasize certain principles covered in the text, provide an overview, and connect the individual components of the course. They may also cover current ideas and research. The lectures provide a guide to the material need to cover for the course. Most lectures will closely follow the textbook or there will be resource material identified. However, students

are encouraged to extend their knowledge by reading from a variety of sources. Lecture notes and recordings are also available online.

Laboratory-based experimentation is an essential part of modern science. The practicals in this course are designed for students to learn and enhance their lab techniques and are designed to complement the lecture series.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Laboratory Work Assessment Format: Individual	22%	
Mid-Term Test Assessment Format: Individual	30%	
RNA-Seq Analysis Presentation Assessment Format: Individual	18%	
Final Theory Exam Assessment Format: Individual	30%	

Assessment Details

Laboratory Work

Assessment Overview

You will undertake three Quizzes worth 4% each.

Practical Quiz 1 (4%) assesses content from Practical 1.

Practical Quiz 2 (4%) assesses content from Practicals 2 and 3.

Practical Quiz 3 (4%) assesses content from Practical 4.

The Quizzes are 1-hour in duration and are scheduled in Weeks 1, 3 & 4 of term. You will complete them outside of normal lab time. The Quizzes typically consist of ten questions consisting of multiple-choice and short response questions. Additional information will be provided during the course. Marks and generalised feedback will be made available shortly after the deadline for each Quiz.

In Week 10, the submission of your Laboratory Notebook (worth 10%) will assess the content and outcomes of practical sessions carried out in Weeks 2-4 and 7-8 of term. This work includes

the presentation and interpretation of experimental data, and answers to discussion questions. Additional information will be provided during the course. Marks and feedback will be provided within 10 working days via Moodle.

Course Learning Outcomes

- CL01 : Perform experimental analysis of gene expression at the mRNA level.
- CL02 : Apply theory and practical methods to the understanding of the molecular properties and functions of nucleic acids.

Detailed Assessment Description

Practical Quizzes:

Three 1-hour quizzes worth 4% each. Format will be multiple choice and short response questions. Conducted via Moodle Quiz with 5 days (including weekends) to complete each Practical Quiz. Practical Quiz 1 is made available 9am Wednesday Week 1. Practical Quiz 2 is made available 9am Wednesday Week 3. Practical Quiz 3 is made available 9am Wednesday Week 4. Marks will be made available within 2 days after written responses have been marked. Feedback for each Practical Quiz will be provided during the practical sessions.

Laboratory Notebook:

Students submit a PDF of their online laboratory notebook in Week 10 via the submission link in Moodle. Marks and feedback will be provided via Moodle. Please see Moodle for information regarding an optional Week 2 lab notebook entry checkpoint.

Assessment information

Laboratory Notebook Assessment

Marks will be deducted for late Laboratory Notebook submissions according to the UNSW policy for late submissions. Late submissions will incur a penalty of 5% reduction in marks per day, including weekends, for up to 5 days (120 hours) from the assessment deadline, after which you cannot submit an assessment and no variation is permitted. The penalty is calculated based on the total possible marks for the assignment. In other words, a penalty of 5% on an assignment marked out of 10 will mean that the final mark is reduced by 5% of 10 (=0.5 marks). Late submissions will be marked using the same marking schema as is used for on-time submissions, and then the total mark that is given for the assessment is reduced by the penalty amount.

Mid-Term Test

Assessment Overview

The Mid-Term test assesses your knowledge on the lecture material presented in Weeks 1-5, inclusive.

The test is 1-hour in duration and is scheduled during Week 7. The test typically consists of multiple-choice, short response and essay response questions. Additional information will be provided during the course.

Marks and generalised class feedback will be provided within 10 working days after the test.

Course Learning Outcomes

- CLO2 : Apply theory and practical methods to the understanding of the molecular properties and functions of nucleic acids.
- CLO3 : Critically evaluate scientific literature relevant to molecular biology.

Assessment Length

1 hour

Assignment submission Turnitin type

This is not a Turnitin assignment

RNA-Seq Analysis Presentation

Assessment Overview

This individual RNA-seq Analysis Presentation (18%) assesses your knowledge of the material presented in Practical 5 on RNA-seq and independent literature searches.

The presentation is 10-minutes in length, with 5-minutes of question time. The presentations are conducted during your scheduled laboratory time in Week 9.

Additional information will be provided during the course.

Marks and personalised feedback will be provided within 10 working days of your presentation.

Course Learning Outcomes

- CLO2 : Apply theory and practical methods to the understanding of the molecular properties and functions of nucleic acids.
- CLO3 : Critically evaluate scientific literature relevant to molecular biology.
- CLO4 : Effectively communicate scientific content through scientific reports and

presentations.

Assessment Length

10 minute presentation and 5 minutes question time

Assessment information

Presentation slides must be submitted as a PDF to the submission link located in Moodle by 9am Wednesday Week 9.

Final Theory Exam

Assessment Overview

The Final Theory Exam assesses your knowledge of the lecture material from Weeks 7-10, inclusive.

The exam is 1-hour in duration and is scheduled during the formal examination period. The test typically consists of multiple-choice, short response and essay response questions.

Additional information will be provided during the course.

Feedback is available through inquiry with the course convenors.

Course Learning Outcomes

- CLO2 : Apply theory and practical methods to the understanding of the molecular properties and functions of nucleic acids.
- CLO3 : Critically evaluate scientific literature relevant to molecular biology.

Assessment Length

1 hour

Assignment submission Turnitin type

This is not a Turnitin assignment

General Assessment Information

Grading Basis

Standard

Requirements to pass course

- 100% lab attendance (in Weeks 2, 3, 4, 5, 7 and 8) is required and is compulsory.
- A medical certificate or other forms of evidence are required from students who are absent from the practical sessions due to illness or other misadventure. Please email your documentation to Lana (lana.ly@unsw.edu.au) within 5 days of the absence.

- If you miss a lab, you must catch up on the work you miss by obtaining a set of results from your lab group members (Weeks 2-4, 8) or completing the individual lab work yourself (Weeks 5, 7, 8). If you have any questions, you may discuss the results with your demonstrator, post your questions in the Moodle Discussion Forums or email the course convenors (Lana (lana.ly@unsw.edu.au) and Irina (i.voineagu@unsw.edu.au)).
- Separate "make-up" lab sessions are not conducted, but if you are able to attend the other lab session (9am-1pm Wednesday or 2pm-6pm Wednesday), you may contact the course convenors to ask for permission to do so. If you cannot attend an alternative lab session, then you will need to catch up on missed work by speaking to your class colleagues, demonstrator and/or convenors.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 12 February - 18 February	Blended	Lectures: 3 live lectures Labs: 1 self-paced online lab (no in-person lab attendance required) Assessments: Practical Quiz 1 released at 9am Wednesday Week 1
Week 2 : 19 February - 25 February	Blended	Lectures: 3 live lectures Labs: In-person practical (9am-1pm Wednesday or 2pm-6pm Wednesday) Assessments: Practical Quiz 1 due at 9am Monday Week 2
Week 3 : 26 February - 3 March	Blended	Lectures: 3 live lectures Labs: In-person practical (9am-1pm Wednesday or 2pm-6pm Wednesday) Assessments: Practical Quiz 2 released at 9am Wednesday Week 3
Week 4 : 4 March - 10 March	Blended	Lectures: 3 live lectures Labs: In-person practical (9am-1pm Wednesday or 2pm-6pm Wednesday) Assessments: <ul style="list-style-type: none">• Practical Quiz 2 due at 9am Monday Week 4• Practical Quiz 3 released at 9am Wednesday Week 4
Week 5 : 11 March - 17 March	Blended	Lectures: 2 live lectures, 1 live Theory Review Labs: In-person practical (9am-1pm Wednesday or 2pm-6pm Wednesday). The analysis performed in this practical forms the basis of your RNA-seq Analysis Presentation conducted in Week 9. Assessments: Practical Quiz 3 due at 9am Monday Week 5.
Week 7 : 25 March - 31 March	Blended	Lectures: 1 live lecture (no lecture on Friday due to Public holiday) Labs: In-person practical (9am-1pm Wednesday or 2pm-6pm Wednesday) Assessments: The Mid-Term Test (1 hour) worth 30% is conducted via Inspera during the Monday lecture timeslot. Lectures 2-14 (inclusive) will be assessed.
Week 8 : 1 April - 7 April	Blended	Lectures: 2 live lectures (no lecture on Monday due to Public holiday) Labs: In-person practical (9am-1pm Wednesday or 2pm-6pm Wednesday) Assessments: No assessments due this week.
Week 9 : 8 April - 14 April	Blended	Lectures: 3 live lectures Labs: No practical this week (RNA-seq Analysis Presentations instead) Assessments: RNA-seq Analysis Presentation (18%) conducted in-person during your normal lab session in Week 9. All slides must be submitted as a PDF to the submission link located in Moodle before 9am Wednesday Week 9.
Week 10 : 15 April - 21 April	Blended	Lectures: 2 live lectures, 1 live Theory Review Labs: No practical this week Assessments: Laboratory Notebooks due 11:59pm Friday

Attendance Requirements

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

General Schedule Information

Lectures

- Students are strongly encouraged to attend all lectures live and review lecture recordings.

Labs

- 100% lab attendance (in Weeks 2, 3, 4, 5, 7 and 8) is required and is compulsory.
- A medical certificate or other forms of evidence are required from students who are absent from the practical sessions due to illness or other misadventure. Please email your documentation to Lana (lana.ly@unsw.edu.au) within 5 days of the absence.
- If you miss a lab, you must catch up on the work you miss by obtaining a set of results from your lab group members (Weeks 2-4, 8) or completing the individual lab work yourself (Weeks 5, 7, 8). If you have any questions, you may discuss the results with your demonstrator, post your questions in the Moodle Discussion Forums or email the course convenors (Lana (lana.ly@unsw.edu.au) and Irina (i.voineagu@unsw.edu.au)).
- Separate "make-up" lab sessions are not conducted, but if you are able to attend the other lab session (9am-1pm Wednesday or 2pm-6pm Wednesday), you may contact the course convenors to ask for permission to do so. If you cannot attend an alternative lab session, then you will need to catch up on missed work by speaking to your class colleagues, demonstrator and/or convenors.

Course Resources

Additional Costs

Students are required to bring and wear their own lab coat, safety glasses and enclosed shoes to each practical. Students may not enter the teaching lab if they are missing these PPE items. Face masks are encouraged to be worn in areas where physical distancing is not possible and will be provided if students wish to wear one.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Irina Voineagu				By appointment	Yes	Yes
	Lana Ly				By appointment	Yes	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 Plagiarism

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](#)