

## BIOL2001: Molecular Laboratory Skills for Biological Sciences

Callaghan

Semester 1 - 2024



THE UNIVERSITY OF  
NEWCASTLE  
AUSTRALIA

### OVERVIEW

**Course Description** This course is designed to provide extensive training in the laboratory practices associated with biological research. Module 1 will focus on enzymes and biochemical reactions; Module 2 will focus on the chemistry of DNA; and Module 3 will focus on Immunochemistry and its application to biological research.

**Academic Progress Requirements** Nil

**Requisites** Students must have successfully completed either SCIE1002 or BIOL1003 or BIOL1070 to be enrolled in this course.

**Assumed Knowledge** Successful completion of level 1000 Biology including BIOL1003.

**Contact Hours**  
**Callaghan Lecture**  
Face to Face On Campus  
2 hour(s) per week(s) for 13 week(s) starting Week 1  
**Practical**  
Face to Face On Campus  
36 hour(s) per term starting Week 1

**Unit Weighting Workload** 10  
Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

# COURSE OUTLINE

---

# CONTACTS

<b>Course Coordinator</b>	<b>Callaghan</b> Dr Ben Long Ben.Long@newcastle.edu.au (02) 4055 4137 Consultation: Via email to arrange appointment
<b>Teaching Staff</b>	Other teaching staff will be advised on the course Canvas site.
<b>School Office</b>	<b>School of Environmental and Life Sciences</b> Room C228 Chemistry Building Callaghan Science-SELS@newcastle.edu.au +61 2 4921 5080 9am-5pm (Mon-Fri)

# SYLLABUS

<b>Course Content</b>	Through undertaking scientific experiments in biology at the cellular and subcellular level including biochemistry, molecular biology and immunochemistry, students will be exposed to the theory and practice of: <ul style="list-style-type: none"><li>– The scientific method and philosophy of science</li><li>– Experimental design, hypothesis testing &amp; problem solving</li><li>– Occupational health &amp; safety Laboratory</li><li>– Molecular laboratory skills</li><li>– Slide preparation &amp; microscope usage</li><li>– Use of selected Measurement Instruments</li><li>– Fundamentals of aseptic technique</li><li>– Use of Lab books to organise and document experimental details and results</li><li>– Data analysis, interpretation and presentation</li><li>– Report Writing<ul style="list-style-type: none"><li>a) Effective use of Introduction, Methods, Results, Discussion format</li><li>b) Referencing</li><li>c) Computer publishing skills</li></ul></li><li>– Working in teams</li><li>– Ethics, Academic and personal/professional integrity</li></ul>
<b>Course Learning Outcomes</b>	<b>On successful completion of this course, students will be able to:</b> <ol style="list-style-type: none"><li>1. Recognise biological terminology and concepts in experimental biology;</li><li>2. Use fundamental skills in the collection, processing and interpretation of biological information;</li><li>3. Practice hazard recognition and minimisation in safe biological investigation;</li><li>4. Operate experimental apparatus;</li><li>5. Work in a team;</li><li>6. Develop critical and ethical thinking and utilise the scientific approach;</li><li>7. Document the results of experimental practice, through laboratory books, recorded data and written laboratory reports;</li><li>8. Compute the calculations required for understanding and interpreting experimental outcomes.</li></ol>

# COMPULSORY REQUIREMENTS

In order to pass this course, each student must complete ALL of the following compulsory requirements:

## Contact Hour Requirements:

- Practical Induction Requirement - Students must attend and pass the induction requirements before attending these sessions. In order to participate in this course, students must complete a compulsory safety induction.

# SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	26 Feb	Introduction to course	Course and assessment structure; lab safety	
2	4 Mar	Basic skills	Lab Safety, basic skills	
3	11 Mar	Enzyme Biochemistry	Enzyme assays	Quiz
4	18 Mar	Kinetics	Enzyme Kinetics	Quiz
5	25 Mar	DNA	DNA Isolation	Laboratory Report 1
6	1 Apr	No labs - Easter	No labs - Easter	
7	8 Apr	Genomes	Properties of DNA	
<b>Mid-Semester Recess</b>				
<b>Mid-Semester Recess</b>				
8	29 Apr	PCR	Electrophoresis PCR	
9	6 May	DNA wrap up & report writing	Electrophoresis 2	Quiz
10	13 May	Immunohistochemistry 1	Immunohistochemistry	Laboratory Report 2
11	20 May	Immunoblotting 1	Immunoblotting	
12	27 May	Immunohistochemistry 2 and Immunoblotting 2	Immunohistochemistry and Immunoblotting	Quiz
13	3 Jun			Laboratory report 3 and Lab book
<b>Examination Period</b>				
<b>Examination Period</b>				

# ASSESSMENTS

This course has 3 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Module Competency Assessments	Weekly	Individual	13%	1, 2, 3, 4, 5, 6, 8
2	Quiz - Online	Weeks 3,4, 9 and 12	Individual	12%	1, 2, 6, 7, 8
3	Written Reports	11:59pm Thursday of Weeks 5, 10 and 13.	Individual	75%	1, 2, 6, 7, 8

## Late Submissions

The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

## Assessment 1 - Module Competency Assessments

<b>Assessment Type</b>	Practical Demonstration
<b>Description</b>	Safety and methodology quizzes, Exhibiting adequate performance in laboratories, Submission of laboratory book.
<b>Weighting</b>	13%
<b>Due Date</b>	Weekly
<b>Submission Method</b>	In Class
<b>Assessment Criteria</b>	Laboratory performance, documented results
<b>Return Method</b>	In Class
<b>Feedback Provided</b>	In Class - In Class. Ongoing verbal feedback on quality of bookwork.
<b>Opportunity to Reattempt</b>	Students WILL NOT be given the opportunity to reattempt this assessment.

## Assessment 2 - Quiz - Online

<b>Assessment Type</b>	Quiz
<b>Description</b>	An online quiz will assess the theory underpinning the practical.
<b>Weighting</b>	12%
<b>Due Date</b>	Weeks 3,4, 9 and 12
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	Multiple choice
<b>Return Method</b>	Not Returned
<b>Feedback Provided</b>	Online - Online feedback is provided per question.
<b>Opportunity to Reattempt</b>	Students WILL NOT be given the opportunity to reattempt this assessment.

## Assessment 3 - Written Reports

<b>Assessment Type</b>	Report
<b>Description</b>	Results from the laboratory are compiled, described and analysed and interpretations made.
<b>Weighting</b>	75%
<b>Due Date</b>	11:59pm Thursday of Weeks 5, 10 and 13.
<b>Submission Method</b>	Online Submit via Canvas
<b>Assessment Criteria</b>	Detailed rubrics are provided on Canvas
<b>Return Method</b>	Online
<b>Feedback Provided</b>	Online
<b>Opportunity to Reattempt</b>	Students WILL NOT be given the opportunity to reattempt this assessment.

# ADDITIONAL INFORMATION

## Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

## Attendance

\*Skills are those identified for the purposes of assessment task(s).

Attendance/participation will be recorded in the following components:

- Practical (Method of recording: Attendance will be recorded from a roll upon entry to each day's laboratory session.)

The Thursday lab preparation lecture contains vital Health and Safety information as well as details of the upcoming practical. It is essential that you attend these lectures face-to-face to ensure effective communication of safety requirements. Attendance is recorded.

## Communication Methods

Communication methods used in this course include:

- Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site.
- Email: Students will receive communications via their student email account.
- Face to Face: Communication will be provided via face to face meetings or supervision.

## Course Evaluation

Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.

## Oral Interviews (Vivas)

As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the [Oral Examination \(viva\) Procedure](#). In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the [Student Conduct Rule](#).

## Academic Misconduct

All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to

---

**Adverse  
Circumstances**

<https://policies.newcastle.edu.au/document/view-current.php?id=35>.

The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where:

1. the assessment item is a major assessment item; or
2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system;
3. you are requesting a change of placement; or
4. the course has a compulsory attendance requirement.

Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at:

<https://policies.newcastle.edu.au/document/view-current.php?id=236>

**Important Policy  
Information**

The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at <https://www.newcastle.edu.au/current-students/respect-at-uni/policies-and-procedures> that support a safe and respectful environment at the University.

**Other Information**

**Reasonable Adjustment Plans (RAP)**

If you are registered with AccessAbility and have been provided with a Reasonable Adjustment Plan (RAP), please ensure that you provide your Course Coordinator with a copy as soon as you can, or let your Course Coordinator know that you are still waiting for your RAP.

*This course outline was approved by the Head of School. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.*

© 2024 The University of Newcastle, Australia