

BIOL3001: Advanced Laboratory Skills in Biological Sciences

Callaghan

Semester 1 - 2024



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

OVERVIEW

Course Description This course is designed to provide extensive and advanced training in the laboratory practices associated with biological research. Students will undertake scientific experiments in molecular biology, microbiology, plant and animal biology.

Students will consolidate their appreciation of the scientific method and philosophy of science; experimental design, hypothesis testing and problem solving; health and safety in the laboratory; the use of lab books to organise and document experimental details and results; data analysis, interpretation and presentation; report writing demonstrating effective use of the introduction, methods, results, and discussion format; referencing; ethics, academic and personal/professional integrity.

Academic Progress Requirements Nil

Requisites Students must have successfully completed BIOL2001 and BIOL2002 in order to enrol in this course.

Contact Hours

Callaghan Laboratory
Face to Face On Campus
84 hour(s) per term
Laboratories will be up to 84 hours in total over the term.

Lecture
Face to Face On Campus
18 hour(s) per term
Lectures will be between 8-12 hrs over the course of the term and include seminars (oral presentations)

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

Course Coordinator	Callaghan A/Pr Karl Hassan Karl.Hassan@newcastle.edu.au (02) 4921 7236 Consultation: by appointment
Teaching Staff	A/Prof Karl Hassan (karl.hassan@newcastle.edu.au) A/Prof Ian Grainge (ian.grainge@newcastle.edu.au) Dr Joseph Pegler (joseph.pegler@newcastle.edu.au) A/Prof Geoffry De Iuliis (geoffry.deiuliis@newcastle.edu.au)
School Office	School of Environmental and Life Sciences Room C228 Chemistry Building Callaghan Science-SELS@newcastle.edu.au +61 2 4921 5080 9am-5pm (Mon-Fri)

SYLLABUS

Course Content	<ol style="list-style-type: none">1. Manipulation of molecular processes2. Advanced analysis and manipulation of microorganisms3. Extended physiological analysis of animal and plant model systems
Course Learning Outcomes	On successful completion of this course, students will be able to: <ol style="list-style-type: none">1. Use biological terminology and advanced concepts and techniques in experimental biology;2. Apply scientific method and philosophy in advanced experimental design;3. Collect, process, and interpret biological information;4. Apply ethical conduct in learning and research;5. Demonstrate hazard recognition and minimisation in safe biological investigation;6. Efficiently organise and perform experimental procedures including all necessary calculations;7. Communicate data in writing.
Course Materials	Other Resources: <ul style="list-style-type: none">- Lecture materials, laboratory protocols and laboratory data will be provided on the course Canvas site

COMPULSORY REQUIREMENTS

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

Contact Hour Requirements:

- Laboratory 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 and Module 1: Molecular Biology/biochemistry	Background/Safety induction	
2	4 Mar	Module 1: Molecular Biology/biochemistry	Background/Safety induction	Mini-oral presentation (Module 1 group)
3	11 Mar	Module 1: Molecular Biology/biochemistry	Module 1 laboratory	
4	18 Mar	Module 2: Microbiology	Background/Safety induction	Module 1 laboratory report
5	25 Mar	Module 2: Microbiology	Background/Safety induction	Mini-oral presentation (Module 2 group)
6	1 Apr	Module 2: Microbiology	Module 2 laboratory	
7	8 Apr	Module 3: Plant biology	Background/Safety induction	Module 2 laboratory report
Mid-Semester Recess				
Mid-Semester Recess				
8	29 Apr	Module 3: Plant biology	Background/Safety induction	Mini-oral presentation (Module 3 group)
9	6 May	Module 3: Plant biology	Module 3 laboratory	
10	13 May	Module 4: Animal biology	Background/Safety induction	Module 3 laboratory report
11	20 May	Module 4: Animal biology	Background/Safety induction	Mini-oral presentation (Module 4 group)
12	27 May	Module 4: Animal biology	Module 4 laboratory	
13	3 Jun			Module 4 laboratory report
Examination Period				
Examination Period				

ASSESSMENTS

This course has 2 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Module competency assessments	ongoing across the course	Individual	20%	4, 5, 6
2	Written Reports	Module 1 Friday 5 pm Week 4 Module 2 Friday 5 pm Week 7 Module 3 Friday 5 pm Week 10 Module 4 Friday 5 pm Week 13	Individual	80%	1, 2, 3, 4, 7

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

Assessment Type	Practical Demonstration
Purpose	To assess competency in preparation for, and practice of laboratory tasks
Description	Laboratory engagement, participation, and competency will be assessed during lab sessions. Mini-talks will take place in the final lecture of each module. Students are asked to present once during semester and will be randomly assigned to a module topic.
Weighting	20%
Due Date	ongoing across the course
Submission Method	Ongoing Assessment Laboratory books will be examined during laboratory classes. Mini-talks will take place in the final lecture of each module. Students are asked to present once during semester and will be randomly assigned to a module topic.
Assessment Criteria	Demonstrate preparation for laboratory classes through preparation of laboratory books and capacity to explain elements of the theory or practice of the laboratory.
Return Method	In Person - on request during class or by appointment.
Feedback Provided	Students WILL NOT be given the opportunity to reattempt this assessment.
Opportunity to Reattempt	

Assessment 2 - Written Reports

Assessment Type	Report
Purpose	To assess student understanding of the laboratory experiments performed and to structure a laboratory/research report to deliver all essential information
Description	Four written reports covering laboratory module, each worth 20%. Detailed instructions on report writing will be presented in class and on Canvas
Weighting	80%
Due Date	Module 1 Friday 5 pm Week 4 Module 2 Friday 5 pm Week 7 Module 3 Friday 5 pm Week 10 Module 4 Friday 5 pm Week 13
Submission Method	Online Submit via Canvas
Assessment Criteria	Clarity of report and detailed understanding of the experiment and intellectual background. Detailed rubrics for the reports will be provided on Canvas
Return Method	Online
Feedback Provided	Online
Opportunity to Reattempt	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.

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

Attendance

Attendance/participation will be recorded in the following components:

- Laboratory (Method of recording: Attendance will be recorded by student card scans upon entry to each laboratory session)
- Lecture (Method of recording: Since important safety information will be provided in the lectures, attendance at lectures will be recorded from a roll)

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 https://policies.newcastle.edu.au/document/view-current.php?id=35 .
Adverse Circumstances	<p>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:</p> <ol style="list-style-type: none">1. the assessment item is a major assessment item; or2. 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; or4. the course has a compulsory attendance requirement. <p>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</p>
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.

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