

BIOL3090: Molecular Biology

Callaghan

Semester 1 - 2024



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

OVERVIEW

Course Description	This course is designed to encompass the major process of molecular biology. These are examined in both eukaryotes and non-eukaryotes. A particular focus will be given to transcriptional regulation in both these systems. An additional section will encompass systems biology.
Academic Progress Requirements	Nil
Requisites	Students must have successfully completed BIOL2001 or BIOL2050 to be enrolled in this course.
Contact Hours	Callaghan Lecture Face to Face On Campus 3 hour(s) per week(s) for 9 week(s) Last week is for revision Seminar Face to Face On Campus 9 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

Course Coordinator **Callaghan**
Prof Brett Neilan
Brett.Neilan@newcastle.edu.au
0421227477
Consultation: Updates regarding course coordinator details will be provided on Canvas

Teaching Staff Other teaching staff will be advised on the course Canvas site.

School Office **School of Environmental and Life Sciences**
Room C228 Chemistry Building
Callaghan
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9am-5pm (Mon-Fri)

SYLLABUS

Course Content

- Genome organisation
- Transcriptional regulation
- Post-Transcriptional regulation
- Epigenetic regulation
- Systems Biology

Course Learning Outcomes **On successful completion of this course, students will be able to:**

1. Interpret and review research in molecular biology;
2. Illustrate the complexities of the regulation of gene expression;
3. Explain the ways in which knowledge of the basic biology of an organism can inform applied research;
4. Develop and communicate scientific theories;
5. Apply skills in information retrieval, interpretation and presentation.

Course Materials **Other Resources:**

- Canvas site: students enrolled in the course can login at <http://canvas.newcastle.edu.au> to access the course Canvas site. Make sure you access the Canvas site on a regular basis to stay up to date with the course.

Recommended Reading:

- References for journal articles and reviews will be provided during lectures or placed on Canvas as necessary throughout the course.

Recommended Text:

- Molecular Biology / David Clark 3rd edition, ISBN: 0128132884

SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	26 Feb	DNA replication and gene transcription initiation in prokaryotes and the lac operon	Attend lectures and seminar workshop. Read texts provided in lectures and on Canvas.	
2	4 Mar	Transcription elongation, attenuation and bacteriophage lambda	Attend lectures and seminar workshop. Read texts provided in lectures and on Canvas.	
3	11 Mar	BIOL3001 lab week - no lectures or seminar workshops	Linking theory to BIOL3001 labs	Quiz 1
4	18 Mar	Protein translation in bacteria	Attend lectures and seminar workshop. Read texts provided in lectures and on Canvas.	
5	25 Mar	Genomics, signal transduction and the stressosome	Attend lectures and seminar workshop. Read texts provided in lectures and on Canvas.	
6	1 Apr	BIOL3001 lab week - no lectures or seminar workshops	Linking theory to BIOL3001 labs	Quiz 2
7	8 Apr	Transcription in eukaryotes	Attend lectures and career seminars	Written Assignment 1 (Prokaryote Molecular Biology) due 8th April
Mid-Semester Recess				
Mid-Semester Recess				
8	29 Apr	Transcription in eukaryotes and RNA processing	Attend lectures and seminar workshop. Read texts provided in lectures and on Canvas.	
9	6 May	BIOL3001 Lab Week - no lectures or seminar workshops	Linking theory to BIOL3001 labs	Quiz 3
10	13 May	Transcription and translation in eukaryotes	Attend lectures and seminar workshop. Read texts provided in lectures and on Canvas.	
11	20 May	Post-transcriptional control of gene expression and molecular biology techniques	Attend lectures and seminar workshop. Read texts provided in lectures and on Canvas.	
12	27 May	BIOL3001 LAB WEEK - no lectures or seminars	Linking theory to BIOL3001 labs	Quiz 4
13	3 Jun	Revision for final exam	Revision of course material	Written Assignment 2 (Eukaryote Molecular Biology) due Monday 3rd June
Examination Period				
Examination Period				

ASSESSMENTS

This course has 4 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Quiz - On-Line	See Canvas for details.	Individual	20%	1
2	Group oral presentation	One presentation per student. Presented in seminar workshop sessions in weeks 2, 4, 5, 8, 10, 11	Group	15%	1, 2, 3, 4, 5
3	Written assignment	One assignment per student. Due on the Monday of either Week 7 or Week 13.	Individual	15%	1, 2, 3, 4, 5
4	Written exam	Formal examination period	Individual	50%	1, 2, 3, 4, 5

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 - Quiz - On-Line

Assessment Type	Quiz
Purpose	Short quizzes to reinforce important aspects of the course and help highlight areas where students need to devote extra attention.
Description	Short online multiple-choice quizzes.
Weighting	20%
Due Date	See Canvas for details.
Submission Method	Online
Assessment Criteria	Correct/incorrect
Return Method	Online
Feedback Provided	Online
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 2 - Group oral presentation

Assessment Type	Presentation
Purpose	To develop scientific reading, interpretation and communication skills
Description	Team presentation of a scientific article related to the current course module.
Weighting	15%
Due Date	One presentation per student. Presented in seminar workshop sessions in weeks 2, 4, 5, 8, 10, 11
Submission Method	In Class
Assessment Criteria	Quality of presentation (visual and verbal), answering audience questions and teamwork.
Return Method	Not Returned
Feedback Provided	In Class
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 3 - Written assignment

Assessment Type	Written Assignment
Purpose	To develop scientific reading, critical reviewing and writing skills
Description	Scholarly review of topics covered in one half (prokaryote or eukaryote) of the seminar series.
Weighting	15%
Due Date	One assignment per student. Due on the Monday of either Week 7 or Week 13.
Submission Method	Online
Assessment Criteria	Scholarly presentation of a small written review of contemporary molecular biology literature.
Return Method	Online
Feedback Provided	Returned Work
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 4 - Written exam

Assessment Type	Formal Examination
Purpose	To assess understanding of course content.
Description	The Final Examination is designed to test the individual student's knowledge of the course material and their ability to describe, analyse and hypothesise from this material.
Weighting	50%
Length	2 hours
Due Date	Formal examination period
Submission Method	Formal Exam
Assessment Criteria	
Return Method	Not Returned
Feedback Provided	No Feedback
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).

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 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 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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