School of Biological Sciences

BIOL303 Biotechnology: Applied Cell and Molecular Biology
Subject Outline
Autumn, 2016
On-Campus
Wollongong

Subject Information
Credit Points: 8
Pre-requisite(s): BIOL215
Co-requisite(s): Nil
Restrictions: Nil
Contact Hours: 2 hrs Lectures, 4 hrs Tutorials /Practicals

Subject Contacts
Subject Coordinator/Lecturer

<table>
<thead>
<tr>
<th>Name</th>
<th>Lezanne Ooi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Building 32 Room 231</td>
</tr>
<tr>
<td>Telephone</td>
<td>61 2 4221 5865</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:lezanne_ooi@uow.edu.au">lezanne_ooi@uow.edu.au</a></td>
</tr>
<tr>
<td>Consultation</td>
<td>Email for appointment</td>
</tr>
</tbody>
</table>

Lecturer

<table>
<thead>
<tr>
<th>Name</th>
<th>Ren Zhang</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Building 35, Room 103</td>
</tr>
<tr>
<td>Telephone</td>
<td>61 2 4221 3427</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:ren_zhang@uow.edu.au">ren_zhang@uow.edu.au</a></td>
</tr>
<tr>
<td>Consultation</td>
<td>Email for appointment</td>
</tr>
</tbody>
</table>

Lecturer

<table>
<thead>
<tr>
<th>Name</th>
<th>Jason McArthur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Building 32, Room 231</td>
</tr>
<tr>
<td>Telephone</td>
<td>61 2 4221 5650</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:jason_mcarthur@uow.edu.au">jason_mcarthur@uow.edu.au</a></td>
</tr>
<tr>
<td>Consultation</td>
<td>Email for appointment</td>
</tr>
</tbody>
</table>

Lecturer

<table>
<thead>
<tr>
<th>Name</th>
<th>Martin Engel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Building 32, Room 224</td>
</tr>
<tr>
<td>Telephone</td>
<td>61 2 4221 5487</td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:martin_engel@uow.edu.au">martin_engel@uow.edu.au</a></td>
</tr>
<tr>
<td>Consultation</td>
<td>Email for appointment</td>
</tr>
</tbody>
</table>
Lecturer

<table>
<thead>
<tr>
<th>Name:</th>
<th>Nady Braidy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>Building 32, Room 229</td>
</tr>
<tr>
<td>Telephone:</td>
<td>61 2 4221 2399</td>
</tr>
<tr>
<td>Email:</td>
<td><a href="mailto:nady_brady@uow.edu.au">nady_brady@uow.edu.au</a></td>
</tr>
<tr>
<td>Consultation mode and times:</td>
<td>Email for appointment</td>
</tr>
</tbody>
</table>

Student Support and Advice

For general enquiries please contact the StudentHub 41:

Location: 41.138B
Telephone: 61 2 4221 3492
Email: smah-students@uow.edu.au
Student Consultation and Communication

University staff receive many emails each day. In order to enable them to respond to your emails appropriately and in a timely fashion, students are asked to observe basic requirements of professional communication.

Please ensure that you include your full name and student number and identify your practical class or tutorial group in your email so that staff know who they are communicating with and can follow-up personally where appropriate.

Consider what the communication is about
- Is your question addressed elsewhere (e.g. in the subject outline or, on the eLearning site)?
- Is it something that is better discussed in person or by telephone? This may be the case if your query requires a lengthy response or a dialogue in order to address. If so, see consultation times above and/or schedule an appointment.
- Are you addressing your request to the most appropriate person?

Specific email subject title to enable easy identification of issue
- Identify the subject code of the subject you are enquiring about (as staff may be involved in more than one subject) put this in the email subject heading. Add a brief, specific query reference after the subject code where appropriate.

Professional courtesy
- Address the staff member appropriately by name (and formal title if you do not yet know them).
- Use full words (avoid ‘text-speak’ abbreviations), correct grammar and correct spelling.
- Be respectful and courteous.
- Allow 3 – 4 working days for a response before following up. If the matter is legitimately urgent, you may wish to try telephoning the staff member (and leaving a voicemail message if necessary) or inquiring at the School Office.
# Table of Contents

Section A: General Information ............................................................................................................... 5  
  Subject Learning Outcomes ................................................................................................................ 5  
  Subject Description ............................................................................................................................. 5  
  eLearning Space ................................................................................................................................. 5  
  Lecture, Tutorial, Laboratory Times .................................................................................................... 5  
  Readings, References and Materials .................................................................................................. 5  
    Textbooks ........................................................................................................................................ 5  
    Prescribed Readings (includes eReadings) .................................................................................... 5  
    Materials .......................................................................................................................................... 5  
    Recommended Readings ................................................................................................................ 6  
  Recent Changes to this Subject .......................................................................................................... 6  
  Laboratory Safety Guidelines .............................................................................................................. 7  
  List of Topics Covered ........................................................................................................................ 7  

Section B: Assessment ........................................................................................................................... 8  
  Assessment Summary ........................................................................................................................ 8  
  Details of Assessment Tasks .............................................................................................................. 8  
  Minimum Requirements for a Pass in this Subject ............................................................................. 9  
    Minimum Student Attendance and Participation ......................................................................... 9  
  Scaling ................................................................................................................................................. 9  
  Late Submission ................................................................................................................................. 10  
    Late Submission Penalty ................................................................................................................. 10  
  Supplementary Assessments ............................................................................................................. 10  
  System of Referencing Used for Written Work .................................................................................. 10  
  Use of Internet Sources .................................................................................................................... 10  
  Plagiarism ........................................................................................................................................ 10  
  Submission of Assessments ............................................................................................................. 11  
  Assessment Return .......................................................................................................................... 11  

Section C: General Advice ....................................................................................................................... 12  
  University Policies ............................................................................................................................ 12  
  Student Support Services and Facilities ............................................................................................ 13  
  Student Etiquette .............................................................................................................................. 13  
  Version Control Table ...................................................................................................................... 13
Section A: General Information

Subject Learning Outcomes

On completion of this subject, students should be able to:

1. Understand and apply the basic theoretical aspects of gene technology and genome analysis
2. Understand and discuss the application and processes of biotechnology
3. Understand the principles underlying and competently perform basic biotechnology-related techniques

Subject Description

This subject will provide students with an overview of medical, agriculture and environmental Biotechnology, including cutting-edge technologies used in research, clinical studies, food science and forensic analysis. Fundamental aspects of Biotechnology will be covered, including recombinant DNA technology, genetic engineering of micro-organisms, plants and animal cells and the expression, production and purification of recombinant proteins. Innovative applications of biotechnology in medical science will also be covered, including in vivo imaging, genome editing, bioinformatic and genome analysis and gene silencing.

eLearning Space

This subject has materials and activities available via eLearning. To access eLearning you must have a UOW user account name and password, and be enrolled in the subject. eLearning is accessed via SOLS (student online services). Log on to SOLS and then click on the eLearning link in the menu column. For information regarding the eLearning spaces please use the following link: http://uowblogs.com/moodlelab/files/2013/05/Moodle_StudentGuide-1petpo7.pdf

Lecture, Tutorial, Laboratory Times

All timetable information is subject to variation. Check latest timetabling information on the ‘Current Student’ webpage on UOW website or log into SOLS to view your personal timetable prior to attending classes. http://www.uow.edu.au/student/index.html

Timetable information can be accessed from http://www.uow.edu.au/student/timetables/info/index.html

Key University Dates can be accessed from http://www.uow.edu.au/student/dates/index.html

Readings, References and Materials

Textbooks
Nil.

Prescribed Readings (includes eReadings)

The following readings are prescribed for this subject, but students are not expected to purchase these. They are available to students through the library on the subjects eLearning site.


Materials

Students are required to bring the following to all practical classes:

- A BOUND copy BIOL303 subject manual
- Calculator
- Ruler, pen etc
• Laboratory coat (a formal requirement of this subject)
• Closed in shoes
• Long hair must also be tied back

Recommended Readings
The following references complement the prescribed readings and textbooks:

Brown, T.A. Gene Cloning and DNA Analysis (6th Ed) This is available as an eBook on the UoW Library website.


Metzenberg S. Working with DNA. Taylor & Francis Group, New York. 2007

Recommended readings are not intended as an exhaustive list, students should use the Library catalogue and databases to locate additional resources.

Recent Changes to this Subject
Nil
Laboratory Safety Guidelines

The rules below are general rules that are required in laboratories.

- Before commencing your project you are to ensure that you understand specific procedures for the laboratory in which you work.
- You will need to fill out a risk assessment form before commencing any experiments (confer with your laboratory supervisor).
- Never use any equipment or attempt any experiment without checking the safety implications with your laboratory supervisor or experienced delegated laboratory worker.
- Undergraduate students are not permitted to work after hours unless there is appropriate approval and supervision.

List of Topics Covered

The following are examples of the topics to be covered in this course. This is not an exhaustive list and will be subject to change.

A Timetable of Topics will be available from the eLearning site in week 1 of session.

- The Genome Era: gene analysis and detection; functional genomics; genome editing; forensic DNA analysis
- Medical biotechnology: recombinant vaccines; human gene therapy; in vivo brain imaging
- Applied biotechnology: Gene knock-out and transgenic animals; viruses and gene technology
- Environmental biotechnology and transgenic plants
### Section B: Assessment

#### Assessment Summary

<table>
<thead>
<tr>
<th>Assessment Item</th>
<th>Form of Assessment</th>
<th>Due Date</th>
<th>Return/Feedback Due Dates</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment 1</td>
<td>Project report 1</td>
<td>29/04/16 Week 5 during practical class</td>
<td>19/05/16</td>
<td>20%</td>
</tr>
<tr>
<td>Assessment 2</td>
<td>Oral presentation of tutorial topic</td>
<td>Assigned in week 1</td>
<td>Throughout session</td>
<td>10%</td>
</tr>
<tr>
<td>Assessment 3</td>
<td>Project report 2</td>
<td>24/05/16 Week 12 during practical class</td>
<td>Week 14</td>
<td>20%</td>
</tr>
<tr>
<td>Assessment 4</td>
<td>Theory exam</td>
<td>During exam period</td>
<td>Release of results</td>
<td>50%</td>
</tr>
</tbody>
</table>

**Total Marks** 100%

#### Details of Assessment Tasks

Assessment tasks will be marked using explicit criteria that will be provided to students prior to submission.

**Assessment 1**
- **Project Report 1**
  - **Due date**: 29/04/16 Week 8 practical class
  - **Weighting**: 20%
  - **Submission**: Submit a hardcopy to your tutor/demonstrator in class. Details provided in class.
  - **Type of Collaboration**: Individual Assessment
  - **Length**: Details provided in class. See Practical Manual – guidelines for Project Reports.
  - **Subject Learning Outcomes**: 2 and 3
  - **Marking Criteria**: The marking criteria will be made available on your eLearning site by week 1 of session and will be discussed in class.

**Assessment 2**
- **Oral Presentation of Tutorial Topic**
  - **Due date**: Assessment due dates will be negotiated between each student and the subject coordinator. Students should have submission dates confirmed by the end of Week 2 of the relevant session.
  - **Weighting**: 10%
  - **Submission**: Presentation in tutorial time
  - **Type of Collaboration**: Group Project
  - **Length**: 10 minutes plus 3 minutes question time
  - **Details**: Students in pairs will be required to give a 10 minute tutorial seminar (followed by 3 minutes of questions) on an area relevant to Biotechnology and, in particular, genetic engineering. It should be based on a research-type paper rather than a review paper. Tutorial talks will run from week 2 or 3 to week 12. Students should choose their own tutorial topic from recent (2012-14) publications in scientific journals. Topics must be approved by a lecturer or demonstrator prior to preparing your presentation. Each student pair should register for a presentation time for their tutorial topic with the Technical Officer, by week 3. There will be a maximum of 3 tutorial talks each week. Attendance at each tutorial is compulsory. Failure to attend any one tutorial will result in a 10% penalty on your own tutorial mark.
<table>
<thead>
<tr>
<th><strong>Assessment 3</strong></th>
<th>Project Report 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Due date</strong></td>
<td>24/05/16 Week 12 practical class</td>
</tr>
<tr>
<td><strong>Weighting</strong></td>
<td>20%</td>
</tr>
<tr>
<td><strong>Submission</strong></td>
<td>Submit a hardcopy to your tutor/demonstrator in class</td>
</tr>
<tr>
<td><strong>Type of Collaboration</strong></td>
<td>Individual Assessment</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>Details provided in class</td>
</tr>
<tr>
<td><strong>Details</strong></td>
<td>See Practical Manual – guidelines for Project Reports</td>
</tr>
<tr>
<td><strong>Style and format</strong></td>
<td>Report</td>
</tr>
<tr>
<td><strong>Subject Learning Outcomes</strong></td>
<td>2 and 3</td>
</tr>
<tr>
<td><strong>Marking Criteria</strong></td>
<td>The marking criteria will be made available on your eLearning site by week 1 of session.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Assessment 4</strong></th>
<th>Form of Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Due date</strong></td>
<td>During exam period</td>
</tr>
<tr>
<td><strong>Weighting</strong></td>
<td>50%</td>
</tr>
<tr>
<td><strong>Submission</strong></td>
<td>Exam papers and answers must be submitted at the conclusion of the exam.</td>
</tr>
<tr>
<td><strong>Type of Collaboration</strong></td>
<td>Individual Assessment</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>3 hours</td>
</tr>
<tr>
<td><strong>Style and format</strong></td>
<td>Exam</td>
</tr>
<tr>
<td><strong>Subject Learning Outcomes</strong></td>
<td>1-3</td>
</tr>
<tr>
<td><strong>Marking Criteria</strong></td>
<td>The marking criteria will be made available on your eLearning site by week 1 of session and will be discussed in class.</td>
</tr>
</tbody>
</table>

**Minimum Requirements for a Pass in this Subject**

To receive a clear pass in this subject a total mark of 50% or more must be achieved. In addition, failure to meet any of the minimum performance requirements is grounds for awarding a Technical Fail (TF) in the subject, even where total marks accumulated are greater than 50%.

The minimum performance requirements for this subject are:

- attempt all assessment tasks
- pass the final exam
- meet the minimum participation requirements set out below.

**Minimum Student Attendance and Participation**

Student attendance at tutorials, practicals, seminars and/or simulations is compulsory and students must attend 100% of classes. Absences will require the submission of an application for Academic Consideration via SOLS and the presentation of suitable documentation, for example a Medical Certificate, to Student Central as soon as practical. For further details about applying for academic consideration visit the Student Central webpage: [http://www.uow.edu.au/student/central/academicconsideration/index.html](http://www.uow.edu.au/student/central/academicconsideration/index.html)

**Scaling**

Scaling may occur in this subject at the end of session by the Unit Assessment Committee and/or Faculty Assessment Committee (FAC). Marks will only be scaled to ensure fairness/parity of marking across groups of students. Scaling will not affect any individual student's rank order within their cohort. For more information refer to Assessment Guidelines – Scaling: [http://www.uow.edu.au/about/policy/UOW058609.html](http://www.uow.edu.au/about/policy/UOW058609.html)
Late Submission
Late submission of an assessment task without an approved extension of the deadline is not acceptable. If you are unable to submit an assessment due to extenuating circumstances (e.g. medical grounds or compassionate grounds), you can make an application of academic consideration. Not all circumstances qualify for academic consideration. For further details about applying for academic consideration visit the Student Central webpage: http://www.uow.edu.au/student/central/academicconsideration/index.html

Late Submission Penalty
Late submission of an assessment task without an approved extension of the deadline is not acceptable. Marks will be deducted for late submission at the rate of 10% of the total possible marks for that particular assessment task per day. This means that if a piece of work is marked out of 100, then the late penalty will be 10 marks per day (10% of 100 possible marks per day). The formula for calculating the late penalty is the total possible marks \( \times 0.10 \times \text{number of days late} \). For the purposes of this policy a weekend (Saturday and Sunday) will be regarded as two days.

No marks will be awarded for work submitted after the assessment has been returned to the students.

Supplementary Assessments
Supplementary assessment may be offered to students whose performance in this subject is close to that required to pass the subject, and are otherwise identified as meriting an offer of a supplementary assessment. The precise form of supplementary assessment will be determined at the time the offer of a supplementary assessment is made.

Students can log on to SOLS and click on the link titled “Supplementary Assessment” to view any applicable offers. Addition information on supplementary assessments is available at: http://www.uow.edu.au/student/exams/suppassess/index.html

System of Referencing Used for Written Work
The Author-Date (Harvard) referencing system should, unless otherwise specified for a particular assessment (check Details of Assessment Tasks), be utilised. A summary of the Harvard system can be accessed on the Library website at: http://public01.library.uow.edu.au/refcite/style-guides/html/

Use of Internet Sources
Students are able to use the Internet to access the most current information on relevant topics and information. Internet sources should only be used after careful critical analysis of the currency of the information, the role and standing of the sponsoring institution, reputation and credentials of the author, the clarity of the information and the extent to which the information can be supported or ratified by other authoritative sources.

Plagiarism
The full policy on Academic Integrity and Plagiarism is found in the Policy Directory on the UOW website.

“The University’s Academic Integrity and Plagiarism Policy, Faculty Handbooks and subject guides clearly set out the University’s expectation that students submit only their own original work for assessment and avoid plagiarising the work of others or cheating. Re-using any of your own work (either in part or in full) which you have submitted previously for assessment is not permitted without appropriate acknowledgement. Plagiarism can be detected and has led to students being expelled from the University.

The use by students of any website that provides access to essays or other assessment items (sometimes marketed as ‘resources’), is extremely unwise. Students who provide an assessment item (or provide access to an assessment item) to others, either directly or indirectly (for example by
uploading an assessment item to a website) are considered by the university to be intentionally or recklessly helping other students to cheat. This is considered academic misconduct and students place themselves at risk of being expelled from the University.

**Submission of Assessments**

Refer to the submission requirements under the details of the individual assessments. Students should ensure that they receive a receipt acknowledging submission. Students will be required to produce this in the event that an assessment task is considered to be lost. Students are also expected to keep a copy of all their submitted assessments in the event that re-submission is required.

**Assessment Return**

Students will be notified when they can collect or view their marked assessment. In accordance with University Policy marked assessments will usually only be held for 21 days after the declaration of marks for that assessment.
Section C: General Advice

Students should refer to the Faculty of Science, Medicine and Health website for information on policies, learning and support services and other general advice.

University Policies

Students should be familiar with the following University policies:

a. Code of Practice – Teaching and Assessment

b. Code of Practice – Research, where relevant

c. Code of Practice – Honours, where relevant

d. Student Charter

e. Code of Practice – Student Professional Experience, where relevant

f. Academic Integrity and Plagiarism Policy

g. Student Academic Consideration Policy

h. Course Progress Policy

i. Graduate Qualities Policy

j. Academic Complaints Policy (Coursework and Honours Students)

k. Policy and Guidelines on Non-Discriminatory Language Practice and Presentation

l. Workplace Health and Safety, where relevant

m. Intellectual Property Policy

n. IP Student Assessment of Intellectual Property Policy, where relevant

o. Policy on Ethical Objection by Students to the Use of Animal and Animal Products in Coursework Subjects, where relevant

p. Human Research Ethics Guidelines, where relevant

q. Animal Research Guidelines, where relevant
r. Student Conduct Rules and accompanying Procedures or Research Misconduct Policy for research students

Student Support Services and Facilities
Students can access information on student support services and facilities at the following link. This includes information on “Academic Support”, “Starting at University,” “Help at University” as well as information and support on “Career’s and Jobs”. http://www.uow.edu.au/student/services/index.html

Student Etiquette
Guidelines on the use of email to contact teaching staff, mobile phone use in class and information on the university guide to eLearning ‘Netiquette’ can be found at http://www.uow.edu.au/student/elearning/netiquette/index.html

Version Control Table

<table>
<thead>
<tr>
<th>Version Control</th>
<th>Release Date</th>
<th>Author/Reviewer</th>
<th>Approved By</th>
<th>Amendment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20151712</td>
<td>Lezanne Ooi – Subject Coordinator</td>
<td>Sonia Losinno – ADE Nominee</td>
<td>FINAL BIOL303 Autumn 2016 Outline</td>
</tr>
</tbody>
</table>