# Subject Outline

**Autumn, 2016**  
**On-Campus**  
**Wollongong**

## Subject Information

**Credit Points:** 12  
**Pre-requisite(s):** SCIE911, BIOL815, BIOL813, SCIE913, SCIE914 for students enrolled in one of the following specialisations for the Master of Science; Biotechnology, Chemistry, Environmental Biology, Medicinal Chemistry.  
**Co-requisite(s):** Subject Code to be entered from subject database  
**Restrictions:** Available only to students enrolled in Master of Science (Biotechnology)  
**Contact Hours:** 2 hrs lectures, 4 hrs tutorial/practical per week

## 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 mode and times:</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 mode and times:</td>
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</table>

<table>
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<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 mode and times:</td>
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</table>

<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 mode and times:</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:

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.
- 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.
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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
4. Develop professional skills for future career pathways

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](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](http://www.uow.edu.au/student/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**

i. Changes to Subject Learning outcomes

ii. New Subject Description

iii. Amend assessment tasks

**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.

**Lecture Topics**
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
- Professional skills development: Research paper critique; poster preparation for conference presentations; CV writing
## 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 date</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>15%</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>15%</td>
</tr>
<tr>
<td>Assessment 4</td>
<td>Scientific Paper Critique</td>
<td>18/03/16</td>
<td>08/04/16</td>
<td>10%</td>
</tr>
<tr>
<td>Assessment 5</td>
<td>Poster</td>
<td>18/03/16</td>
<td>Assessed in class</td>
<td>10%</td>
</tr>
<tr>
<td>Assessment 6</td>
<td>Theory Exam</td>
<td>During Exam Period</td>
<td>Release of results</td>
<td>10%</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**: 29/04/2016
  - **Weighting**: 15%
  - **Submission**: Submit a hardcopy of your assessment to your tutor/demonstrator in class.
  - **Type of Collaboration**: Individual Assessment
  - **Length**: Details provided in class
  - **Details**: See Practical Manual – guidelines for Project Reports
  - **Style and format**: Report
  - **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**: Assigned in Week 1
  - **Weighting**: 10%
  - **Submission**: Submit a hardcopy of your assessment
  - **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.
  - **Style and format**: Presentation in tutorial time
<table>
<thead>
<tr>
<th>Subject Learning Outcomes</th>
<th>1 and 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marking Criteria</td>
<td>The marking criteria will be made available on your eLearning site by week 1 of session.</td>
</tr>
</tbody>
</table>

**Assessment 3**
- **Project Report 2**
- **Due date**: 24/05/2016
- **Weighting**: 15%
- **Submission**: Submit a hardcopy of your assessment to your tutor/demonstrator in class.
- **Type of Collaboration**: Individual Assessment
- **Length**: Details provided in class
- **Details**: See Practical Manual – guidelines for Project Reports
- **Style and format**: Report
- **Subject Learning Outcomes**: 2 and 3
- **Marking Criteria**: The marking criteria will be made available on your eLearning site by week 1 of session.

**Assessment 4**
- **Scientific Paper Critique**
- **Due date**: 18/03/2016
- **Weighting**: 10%
- **Submission**: Submit a hardcopy of your assessment to your lecturer in class
- **Type of Collaboration**: Individual Assessment
- **Length**: Details provided in class
- **Details**: 11/03/16 PROFESSIONAL SKILLS DEVELOPMENT EXERCISE: Paper Critiquing
  - Introduction to Paper Critique
  - 9.30 am to 2.30 pm in 19.1098. Details of assessment will be provided in class.
- **Style and format**: Report
- **Subject Learning Outcomes**: 1, 2 and 4
- **Marking Criteria**

**Assessment 5**
- **Poster**
- **Due date**: 18/03/2016 – marked in the class
- **Weighting**: 10%
- **Submission**: Submit a hardcopy of your assessment to your lecturer in class.
- **Type of Collaboration**: Individual Assessment
- **Length**: N/A
- **Details**: Details provided in class
- **Style and format**: Poster
- **Subject Learning Outcomes**: 1, 2 and 4
- **Marking Criteria**: The poster session will be held:
  - Poster Preparation for Conference presentations
  - Tutorial 9.30 – 10.30
  - Poster session 10.30 – 2.30 pm (location: Library Lab 2)
  - Details of assessment will be provided in class and the assessment will be marked during the class.
### Assessment

<table>
<thead>
<tr>
<th>Assessment 6</th>
<th>Theory Exam</th>
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</thead>
<tbody>
<tr>
<td><strong>Due date</strong></td>
<td>During Exam Period</td>
</tr>
<tr>
<td><strong>Weighting</strong></td>
<td>40%</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>Three hours</td>
</tr>
<tr>
<td><strong>Details</strong></td>
<td>Provided in class</td>
</tr>
<tr>
<td><strong>Style and format</strong></td>
<td>Final exam</td>
</tr>
<tr>
<td><strong>Subject Learning Outcomes</strong></td>
<td>1-3</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:

- Obtain a total grade of 50% or higher on the final examination.

### Minimum Student Attendance and Participation

It is expected that students will allocate 24 hours per week to this subject, including any required class attendance, completion of prescribed readings and assessment tasks.

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](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 x 0.10 x 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.

**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/](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
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 BIOL980 Autumn 2016 Outline</td>
</tr>
</tbody>
</table>