



School of Chemistry & Molecular Biosciences

Faculty of Science

HONOURS IN BIOTECHNOLOGY

Program Guide

2016

BIOT6121/BIOT6122
RBUS6911



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA



Honours in Biotechnology Program Guide

2016

Retain this guide and refer to it as required throughout the year. You must meet deadlines without having to be reminded.

Please note: This guide should be read in conjunction with the electronic course profile (ECP) for each course you are enrolled in.

Link to the Biotechnology Research Projects booklet can be found at: scmb.uq.edu.au/biotech

Link to searchable database of UQ researchers: researchers.uq.edu.au/uqexperts

“Every effort has been made to ensure the accuracy of information in this document at the time of publication. The authoritative source of program and course information is the UQ Courses and Programs website at www.uq.edu.au/study/. Where any conflict of information exists, the rules and associated course lists approved by the UQ Senate shall apply.”

1 February 2016

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SECTION 1: INTRODUCTION

OVERVIEW OF BIOTECHNOLOGY HONOURS

If you have completed year three of the Bachelor of Biotechnology you are expected to take the fourth year at honours level. As a guideline, for entry into the honours program you should have a grade point average (GPA) of at least 4.5 on #8 (8 units) of level 3 courses taken during Part A of your program.

The two major courses of the program are BIOT6121/BIOT6122 - Research Project in Biotechnology (worth #14 of the honours year assessment) and RBUS6911 - Commerce Honours Seminar (which is worth #2 of the honours year assessment and covers the management of Intellectual Property). The research project will be chosen in consultation with, and will be supervised by, a staff member of an appropriate School, Research Centre or Institute. Joint supervision is possible. You should talk with potential supervisors in the semester preceding the semester in which you intend to commence the honours program regardless of whether you intend to commence in first or second semester. You must also advise the Biotechnology Honours Coordinators of your intentions, in order to facilitate administration of this multi-disciplinary area.

NOTE: Biotechnology students are able to do projects, with an approved supervisor from any appropriate School, Faculty, Centre or Institute within UQ or UQ affiliated group, and even with companies and non-UQ affiliated groups, with permission from the Biotechnology Honours Coordinators.

A list of staff members of The University of Queensland with interests in biotechnology, and a summary of their current biotechnology research can be found in the Biotechnology Program Research Projects booklet (a link to this booklet can be found on page 1 of this booklet).

The major objectives of the honours year are:

- to teach library skills: literature searching, extraction and organisation of information, critical reading;
- to teach research skills: planning, execution and analysis of experiments, development of technical skills;
- to expose you to written and oral communication skills;
- to give you an overview of issues affecting biotechnology;
- to assess your potential for employment or study towards a higher degree;
- to expose you to a specialised area of biotechnology.

As a biotechnologist you need to communicate not only with experts in your particular sub-discipline, but also with scientists and engineers with only a limited knowledge in your area. In the preparation of your reports you have the challenging task of communicating effectively with both of these audiences. You will be required to communicate through the writing of your literature review/research proposal, and research report. You will also demonstrate your oral communication skills by presenting two seminars on your research.

During your honours year you should feel that you belong to two groups:

- Firstly, you should feel that you are a part of the School/Institute/Centre in which you are located. Therefore, you are expected to attend the seminar program in the School/Institute/Centre in which you are based. In addition, you are encouraged to attend relevant seminars in other Schools, Institutes and Centres e.g., in Botany, Biochemistry, Chemical Engineering, Microbiology, Zoology, Institute of Molecular Bioscience (IMB), Australian Institute of Bioengineering and Nanotechnology (AIBN), etc.
- Secondly, but no less importantly, you should feel part of the group of biotechnology honours students, a group with members located in various Schools, Institutes and Centres.

AIM OF THIS GUIDE

This guide summarises the requirements for assessment items, provides a timetable of due dates, and outlines the assessment criteria which will be applied to your work. You are expected to follow these guidelines and meet the deadlines listed without having to be reminded of them. Therefore you should read this guide and the electronic course profile (ECP) carefully now, and ensure that your supervisor does the same. Any queries should be directed to the Biotechnology Honours Coordinators, Dr Steve Reid, Ph (07) 3365 3991, email: steven.reid@uq.edu.au or Prof Ross Barnard, Ph (07) 3365 4612, email: rossbarnard@uq.edu.au

ENROLMENT DETAILS

The BBiotech (Hons) program code is 2375 (as for the Bachelor of Biotechnology (Honours) 4 year program in general).

The course codes are as follows:

BIOT6121 (#14): Research Project in Biotechnology (**BIOT6122** if you start Honours mid-year)

RBUS6911 (#2): Commerce Honours Seminar

Students **commencing in February** will enrol in the following:

First semester of your Honours studies	BIOT6121 and RBUS6911
Second semester of your Honours studies	BIOT6121

Students **commencing in July** will enrol in the following:

First semester of your Honours studies	BIOT6122
Second semester of your Honours studies	BIOT6122 and RBUS6911

ASSESSMENT SUMMARY

Course Code	Course Title	# Worth	Assessment Item	# worth
BIOT6121 BIOT6122	Research Project in Biotechnology	14	Attend Seminars (15 for the year) and keep a diary	0.0 Pass/Fail
			Group Work Participation Service and Engagement	0.0 Pass/Fail
			Research Proposal	2
			Proposal Seminar	0.5
			Written Report/Lab Performance	10
			Final Seminar Response to Final seminar/ Questions	1.5
RBUS6911	Commerce Honours Seminar	2	See electronic course profile (ECP) for RBUS6911	2

Note: This is a guide only. Please refer to the electronic course profile (ECP) for complete assessment details.

CLASSES OF HONOURS

The class of honours you achieve is an assessment of the potential you have shown to complete a research degree successfully. Honours is awarded in one of the following classes:

Honours Class	GPA	Comments
Class I	6.200 – 7.000	Work of very good quality consistent with a student who would make a good PhD candidate or research assistant; the report contains examples of excellent critical thinking skills and personal insights into the research area.
Class IIA	5.650 – 6.199	Work of good quality in all aspects of the report as expected from a student who has the potential to be able to undertake a PhD or act as a research assistant, but shows lesser critical thinking skills and personal insights into research area.
Class IIB	5.000 – 5.649	Adequate quality in most aspects of the report, but some inadequacies in understanding, critical thinking skills, literacy, organisation and presentation.
Class IIIA	4.000 – 4.999	Adequate quality work with significant deficiencies in understanding, critical thinking skills, literacy, organisation and presentation.
Class IIIB	<4.000	Inadequate quality work with significant errors and deficiencies in understanding, critical thinking skills, literacy, organisation and presentation.

Your final honours percentage used will be the sum of your weighted marks for BIOT6121/6122 and RBUS6911.

Note that a grade within 2 marks of a cut-off is considered borderline, e.g. 78.1 - 81.9% is borderline Class I honours and may require moderation by the Biotechnology Honours Subcommittee. For higher marks, 82-84% represents a clear Class I Honours grading, while 85-89% represents an excellent performance, 90% is outstanding and would be awarded very rarely (perhaps one out of every 30-40 candidates). Higher marks are for the genius class of student - one would be lucky to see the award of such a mark in one's lifetime!

RESULTS NOTIFICATION

An unofficial summary of results of all honours courses, with recommended GPA and Class of Honours will be provided to students at the end of the final semester, at approximately the same time as the SI-net grades are published for individual courses.

Class of Honours will be noted on students' SI-net records following the graduation ceremony.

All reports and any feedback from examiners of reports and seminars will be handed back to the student along with the summary sheet.

The reports are the property of the supervisor and as such must be returned to the supervisor before the end of the semester in which honours was completed. All comment/feedback sheets can be retained by the student.

SECTION 2: TIMETABLE

RESEARCH PROJECT TIMETABLE FOR BIOT6121 STUDENTS (BEGINNING IN SEMESTER 1, 2016)

Before 27 Jan	SUBMIT Application (preferable to be submitted by mid-December 2015)
Mon 1 Feb (Hons Week 1)	Start
Mon 1 Feb (Hons Week 1)	Biotech Hons Orientation
Fri 12 Feb (Hons Week 2)	SUBMIT Project outline
Wed 6 Apr (Hons Week 10)	Research Proposal/Literature Review due (2 examiners – supervisor is not one of them) SUBMIT through the course Turnitin submission point in Blackboard
Wed 20 – Fri 22 April (Hons Week 12)	Proposal seminar (Feedback by two members of Biotechnology Honours Committee)
13-17 June (Hons Week 20)	Semester 1 Seminar Diaries due for checking (7-8 seminars minimum to be covered). Checked by Honours Committee members.
19-23 Sep (Hons Week 34)	Finish benchwork (Strongly recommended but not compulsory) Designed to give you 4 weeks to complete your research report.
19-23 Sep (Hons Week 34)	Semester 2 Seminar Diaries due for checking (Total of 15 seminars for the year, to be checked by Honours Committee member)
Wed 19 Oct (Hons Week 38)	Research Report and experiment notebooks due (2 examiners – supervisor is not one of them) SUBMIT through the course Turnitin submission point in Blackboard
Wed 2 Nov – Fri 4 Nov (Hons Week 40)	Research Seminar (Marked by Biotechnology Honours Committee members with questions asked by Research Report Examiners.)

Timing and submission procedures for RBUS6911 can be found via the course profile for this course.

**RESEARCH PROJECT TIMETABLE FOR BIOT6122 STUDENTS
(BEGINNING IN SEMESTER 2, 2016)**

Before 20 July	SUBMIT Application (preferable to be submitted by mid – end June 2015)
Mon 25 July (Hons Week 1)	Start (Welcome/Orientation)
Fri 5 Aug (Hons Week 2)	SUBMIT Project outline
Wed 28 Sep (Hons Week 10)	Research Proposal/Literature Review due (2 examiners – supervisor is not one of them) SUBMIT through the course Turnitin submission point in Blackboard
Wed 12-Fri 14 Oct (Hons Week 12)	Proposal seminar (Marked by two members of Biotechnology Honours Committee)
5-9 Dec (Hons Week 20)	Semester 1 Seminar Diaries due for checking (7-8 seminars minimum to be covered) Checked by Honours Committee members
2017	Students starting mid-year may take a break of 1-4 weeks from 12 Dec 2016 -7 Jan 2017
24-28 April (Hons Week 40)	Finish benchwork (Strongly recommended but not compulsory) Designed to give you 4 weeks to complete your research report.
24-28 April (Hons Week 40)	Semester 2 Seminar Diaries Due for checking (Total of 15 seminars for the year, to be checked by Honours Committee member)
Wed 24 May (Hons Week 44)	Research Report and experiment notebooks due (2 examiners – supervisor is not one of them) SUBMIT through the course Turnitin submission point in Blackboard
Mon 5 June – Fri 9 June (Hons Week 46)	Research Seminar (Marked by Biotechnology Honours Committee members with questions asked by Research Report Examiners.)

ORIENTATION

An Orientation/Welcome session for each new intake of Honours students is held on the first day of the students' Honours year. Supervisors and co-supervisors are welcome to attend.

SUBMISSION PROCEDURES (BIOT6121/6122):

All reports (except your Project Outline) must be submitted through the course Turnitin submission point in Blackboard by 2:00pm on the due date. No hardcopy is to be submitted. SCMB will distribute your Turnitin submission for marking.

Penalties for **late submission** will apply for all written reports:

- (1) The Research Proposal/Literature Review
- (2) The Research Report

FOR SUBMISSIONS MADE AFTER THE DUE DATE (WITHOUT A VALID EXTENSION), PENALTIES WILL APPLY AS OUTLINED IN THE BIOT6121/6122 ELECTRONIC COURSE PROFILES.

These penalties can make a difference to the level of honours obtained; therefore you must allocate sufficient time to these tasks to ensure that you can meet the deadlines.

You should submit drafts of your literature review, and research report to your supervisor. The feedback you receive is part of the learning process. To obtain maximum benefits from the submission of drafts they should be submitted well before the due date.

For the purposes of this document a standard page is defined as an A4 page with a 4cm margin on the left (to allow for the binding) and 2cm margins at the top, bottom and right. This leaves a typing area of 15cm width and 25cm length. A line spacing of 1.5 is to be used, and the text must be in 12 point. It is preferable to use a proportional font, and one that is easy on the eye to read, such as Times New Roman.

CLARIFICATION OF STARTING DATE

The earliest a student can start experimental work directly related to their honours research project, is the starting date indicated in Section 2: Timetable. Students who are offered vacation work in the laboratory in which they intend to do their honours, prior to this starting date, must not work on their honours project before the official starting date, and must not use data generated prior to the official starting date in their final research report.

We do not want to deter students who wish to do literature research (background reading) related to their project prior to the official starting date, or even to stop students from working in the laboratory prior to this starting date, in order to gain general laboratory experience, but it is not acceptable if students generate data for use in their final report prior to the official starting date.

SECTION 3: APPLICATION

APPLICATION FORM

An application form for Biotechnology Honours can be collected from the SCMB Administration Office, Level 3, Chemistry Building (68). You can also request one via email to scmbbiotechnology@uq.edu.au

Please note: The principal supervisor must be a research group leader who is either:

- (a) a staff member of the School;
- (b) an official affiliate staff member of the School; or
- (c) a Head of School-approved employee of a research institute or industry.

For staff members and affiliates, a research group leader is defined as a person holding a continuing academic position or funded by an external competitive research fellowship.

Due: Prior to the official starting date for Honours but preferably by the end of the preceding semester.

Please complete the BBiotechnology (Honours) Application form, have it signed by your supervisor and submit it to Florence Amery, SCMB Administration Office, Level 3, Chemistry Building (68).

RESEARCH PROJECT OUTLINE FORM

This form will be emailed to students in the first week of the Honours year, to be completed and returned. It may also be requested electronically from: scmbbiotechnology@uq.edu.au

Due: End of Week 2 of the honours year.

Please complete the Research Project Outline and submit it electronically (by email) in a Word document (.doc) not PDF, to SCMB Biotechnology – scmbbiotechnology@uq.edu.au, plus submit a paper copy signed by student and supervisor(s), to Florence Amery, SCMB Administration Office, Level 3, Chemistry Building (68), by the due date in Honours Week 2.

Useful tip: The checkboxes on the form can be accessed by double-clicking on the box. There will be a radio button to choose “Checked” which will place an X in the box.

This outline is used to determine suitable examiners for your report, and is used by the Biotechnology Honours Committee to check that the project has reasonable objectives. It is an important document and requires reasonable effort by you and your supervisor during the first 2 weeks of your honours studies. Your supervisor should be consulted extensively during the preparation of this outline.

The electronic form of the outline is required so that it can readily be distributed to Biotechnology Honours Committee members and potential examiners for their consideration.

COMMERCIAL-IN-CONFIDENCE PROJECTS

Where a project is confidential the report should be clearly marked on the front page “Commercial-in-Confidence” and also on each page of the document. Adding this wording to the Header and/or Footer of the main document would achieve this.

The Biotechnology administration office should be made aware of confidentiality requirement so that the necessary forms can be provided to examiners.

SECTION 4: RESEARCH PROPOSAL & LITERATURE REVIEW

GENERAL REQUIREMENTS

During the first few months of your honours project you will search the literature and write a critical review that will normally be related to (although not necessarily restricted to) the research project. The Research Proposal/Literature Review is to be no longer than 4,000 words, excluding references and table/figure legends. A word count must be listed in the title page and marks will be deducted if in excess of 4,400 words are submitted.

NOTE: This is a Research Proposal supported by a relevant Literature Review. Of the 4,000 word document up to 25% (1,000 words), should be devoted to an outline and defence of your proposed research, the proposed timeline and the methods you propose to use. The preceding literature review should support your experimental design and choice of methods.

Consult librarians for help in literature searching. Computer searches and access to material outside the University require the approval of your supervisor.

The review should be written clearly and concisely, in a style consistent with major reviewing journals. It will consist of:

- Title Page: Title of review, name of student, course and word count.
- Contents page: All chapters and subheadings.
- List of abbreviations.
- Literature review: Organised into chapters and subheadings. All information is to be properly referenced (author and year) to distinguish it from your own ideas and opinions.
- Summary and evaluation: Outlining deficiencies in the literature in relation to the project and therefore defining the problem, which the research project will tackle.
- Outline specific research objectives (hypothesis that you aim to prove), methods to be developed and used, and timeline for major experiments. Defend the objectives and methods listed by reference to your literature review and through discussion.
- A full and accurate list of references (including titles of articles).

The review must be typed, or word-processed, in the standard page format specified earlier in this document (see Submission Procedures on Page 10).

Submit through the course Turnitin submission point in Blackboard as per the instructions provided under Submission Procedures on Page 10.

The review will be assessed on the basis of:

- The comprehension of the present state of the field.
- The critical analysis of previous work, conclusions and theories.
- The clarity and organisation of the writing.
- The clarity of the research objectives, and defence of proposed methods.

MARKING

Two examiners appointed by the Biotechnology Honours Committee will examine the Research Proposal/Literature Review. Your supervisor will not be one of the two examiners, nor will your co-supervisor be an examiner if you have a co-supervisor. Examiners will be provided with a copy of the instructions you have received, and the following assessment guide.

Class	Mark	Comments
I	> 80	Work of exceptional quality showing deep understanding of subject matter and clear appreciation of issues. Incisive selection and analysis of literature. Outline of clear objectives, logical experimental design and identification of appropriate methods as part of the experimental design.
IIA	70-79.99	Work of high quality showing strong grasp of subject matter and appreciation of the dominant issues, though not necessarily of the finer points. Relevant selection and analysis of literature.
IIB	60-69.99	Work of solid quality showing competent understanding of subject matter and appreciation of main issues, though possibly with some lapses and inadequacies and with clearly identifiable deficiencies in logic.
III	50-59.99	Adequate report but showing a minimal understanding of the literature
Fail	< 50	

Examiners will be encouraged to give detailed feedback on all aspects of your Research Proposal/Literature Review. This gives you an opportunity for feedback on your writing skills before your major writing exercises towards the end of honours. Take advantage of this by carefully considering the feedback provided by your examiners.

RETURN OF DOCUMENTS FOLLOWING MARKING

Copies of assessment items and/or marking sheets will be returned to students as soon as possible following marking. An unofficial summary of assessment details of both the Research Proposal and the Proposal Seminar will be provided with the document.

QUESTIONS TO KEEP IN MIND

Below are some of the questions the examiners of your Research Proposal/Literature Review will have in mind as they read your document.

- Is the topic clearly explained and put into context?
- Are the scope and aims of the literature review clearly explained?
- Has the literature been well searched and have gaps in the literature been identified?
- Have conflicts, inconsistencies and errors in the literature been identified?
- Has the literature been carefully analysed and discussed in sufficient detail?
- Is the review well-structured and organised?
- Is the writing style good? (grammar, sentence construction, paragraph construction)
- Is the review written clearly and concisely?
- Does poor presentation divert attention away from the content?
- Are there logical gaps within the review?
- How well has the general theme of the review been developed?
- Does the review meet the aims it set out?
- Have you drawn appropriate conclusions from the review?
- Have you linked the review to the need for your research?
- Have you established a clear hypothesis for your intended research to answer?
- Have you identified major methods to be developed/used?
- Have you assessed the time required for the suggested work and is the assigned time realistic?

You should use these questions to guide you as you write.

SECTION 5: PROPOSAL SEMINAR

During Week 12, you will give a 20-minute seminar outlining the area of your project and your proposed research. This seminar has two aims:

- to give you an opportunity to practice your seminar presentation skills and to obtain constructive feedback
- to generate questions and discussion about your experimental work

For this seminar 15 minutes will be allowed for the presentation and five minutes for discussion and questions. You should time your seminar to run somewhere between 14 and 15 minutes. If you go over time, you will be cut-off in mid-sentence at 16 minutes.

PLEASE NOTE: Computers used in seminar rooms are PCs. It is the student's responsibility to ensure that any presentations prepared on a Mac are compatible with and will run on the supplied PC. Student's own laptops are not used in seminar presentations.

SUGGESTIONS FOR PREPARING YOUR TALK

1. **CONTENT** - Remember, the purpose of giving a talk is to get a clear message across to the audience. It is not necessary to try to impress the audience with the amount of your knowledge. Therefore, do not try to present too much material. Build your talk around a clear central theme. Any issues which detract from a clear presentation, however important, can be dealt with in question time if necessary.
2. **DELIVERY** - Pay attention to presentation techniques. Use appropriate audiovisual aids. Speak clearly and not too fast. It is a good idea to consult books that give tips for public speaking.
3. **STRUCTURE** - Plan to spend up to half the time on the background of your project to show the wider context of your project and half on what exactly you intend to do and how you intend to do it. Remember that most of the audience may be unfamiliar with your research area. Also remember, that in biotechnology, your audience will have a wide variety of backgrounds from the various biological sciences and engineering and even sometimes from business and law.

The Proposal Seminar will be marked out of 100 and contributes 25% to your overall seminar mark for BIOT6121/6122 and 0.5 units of your overall honours assessment. It will be attended by two members of the Biotechnology Honours Committee who will mark the seminar and provide feedback, and may be attended by the examiners of your Research Proposal/Literature Report. The main purpose of the Proposal Seminar, as indicated above, is to provide you with an opportunity to develop your seminar skills ahead of presenting your final Research Seminar at the end of your honours year. It is also an opportunity for examiners of your research proposal to ask you questions/clarify certain points and so may influence the final mark for your research proposal.

The Proposal Seminar will contribute 25% to your overall seminar mark.

SECTION 6: SEMINAR DIARIES

Students are required to attend weekly research seminars (at least 15 for the year – 7/8 per semester), and maintain a diary, using a hardcover bound notebook (no loose sheets) that shows:

- The date, title of the seminar and the speakers name and affiliation
- Notes made during the seminar
- A paragraph that states the objectives of the speaker's work (i.e. what was he/she trying to show), what was achieved and the value of the seminar material to the student's own research project, perceived career direction or interests. This should be added after the seminar, based on the notes taken. Material copied directly from the speaker's abstract is not acceptable.

Seminars that can be attended are not limited to those given in the School or Institution where you are conducting your research.

You are encouraged to locate and check regularly, seminar lists put out by appropriate schools and research institutions (see some appropriate web sites at the bottom of the next page).

Informal seminars or presentations made at research group meetings are not acceptable for this part of the course.

The diary will be reviewed by a member of the Honours Committee (Due Week 20 and Week 34 of your Honours intake).

The Diary will be graded as PASS/FAIL only, but a fail means a FAIL FOR HONOURS.

*Copies of the questions that will be used to assess your diaries are shown on the next page.

DIARY ASSESSMENT CRITERIA

Number of seminars attended to date should be a minimum of 15 for the year (7/8 per semester).

The questions that will be used to assess your diaries are:

Q1) Are all seminars attended of an appropriate standard?

Formal seminars that can be attended are not limited to those given in the student's School or Institution. Attendance at seminars held in other Schools, Centres or Institutes is acceptable. However, informal seminars or presentations made at research group meetings are not acceptable for this part of the course. PhD graduates final or exit seminars are suitable but not other seminars delivered by PhD students during the course of their studies (including PhD confirmation seminars).

Q2) For all seminars have the following been listed/done:

- The date, title of the seminar and the speaker's name and affiliation
- Notes made during the seminar
- A paragraph that states the objective(s) of the speaker's work (i.e. what was he/she trying to show), what was achieved and the value of the seminar material to the student's own research project, perceived career direction or interests. This should be added after the seminar, based on the notes taken. Material copied directly from the speaker's abstract is not acceptable.

Q3) Are the seminar diary entries in a hardbound notebook?

Q4) Is the diary appropriate for the award of a pass mark?

Note: Diaries must be in a hard bound book rather than on loose sheets of paper.

ADDRESSES FOR SEMINAR LISTS

(**NOTE:** This does not cover all UQ Seminar lists) Visit these sites to check seminar dates and times.

IMB (Institute for Molecular Bioscience): www.imb.uq.edu.au

AIBN (Australian Institute for Bioengineering & Nanotechnology): www.aibn.uq.edu.au

QBI (Queensland Brain Institute): www.qbi.uq.edu.au

SCMB (School of Chemistry & Molecular Biosciences): www.scmb.uq.edu.au

SBMS (School of Biomedical Sciences): www.uq.edu.au/sbms

School of Biological Sciences: www.biology.uq.edu.au

SECTION 7: SERVICE AND ENGAGEMENT

Type: Group Work Participation

Period: 1 Feb 15 - 19 Oct 16

Weight: Pass/Fail

TASK DESCRIPTION

As a scientist's career progresses, they are expected to meet milestones in three fields. The first two are Research and Teaching. The third is known as "Service and Engagement" During the service and engagement component, we are expected to contribute to our community through participation in committees, acting as host to visitors, and helping organise events such as UQ open day. In fact, as a scientist's career progresses, service and engagement becomes more and more important. The most senior administrators in the University system are almost exclusively involved in service and engagement. They rarely teach, and their research programs are often minimal. Their jobs are related to building community and nurturing activity within and beyond the University.

As an Honours student, you experience the research component on a daily basis in the laboratory. You act as teachers when tutoring undergraduate practicals. Experience in the third component, service and engagement, is more difficult to acquire, but it is extremely important for you to be able to demonstrate engaged behaviour to future employers. Evidence of engagement can be the extra "boost" your CV needs to get you over the line in applications for jobs or further study.

The "Service and Engagement" assessment item has been developed to help you build skills and experience in service and engagement, and is based on recommendations of an SCMB Honours focus group. The assessment item provides an opportunity for you to play an active role in building congeniality and esprit de corps within the Honours cohort, and by extension the School. This will be achieved by having you contribute to a classic Honours tradition: the organization of an event that draws the members of the School community together through interaction with the Honours cohort.

In the first week of Honours you will be provided with a list of dates when events will be held. Each event will be associated with an Honours assessment-related date; as we don't want you to have to organise an event when you have a major assessment item due, you will be holding them on the assessment due dates of the previous or next Honours cohort, not your own.

The task will consist of three components, to which ALL group members must contribute:

- Preparation (contributing to the organization for a cohort-building event),
- Implementation (holding the event), and
- Debriefing (a discussion afterwards that includes reflection and suggested improvements).

Preparation: Well before the event, your group needs to develop a rough plan for how you will enhance the interaction of the Honours community with the rest of the School on the day you have been given. It is key that you involve the Honours Directors in this discussion, as the event must be deemed appropriate, feasible to implement and possible to fund with a budget of \$500. It is School policy that alcohol not be involved. Previous students have engaged in these types of activities, so the Honours Directors can use this knowledge to help you in your decision making process. At least a week before the event, organize to meet with one of the Honours Directors to describe your plan in detail, what its strengths are, and, most importantly, how your specific implementation is feasible and fits within the budget. A key aspect of this component of the task is to learn to work closely as a team, and during this process get to know your teammates better. This is an opportunity to become familiar with each other's projects, and consider how you could help each other outside of the service and engagement event.

Implementation: You must hold your service and engagement event on the day allocated. Your goal will be to foster stronger interactions within the Honours cohorts, as well as with the other members of the School of Chemistry and Molecular Biosciences (including academics, students, post-docs and professional staff from both building 68 and 76). An important group to consider is the other Honours cohort, with whom you may have had little contact so far. The people you meet in this environment may be able to help in some way with your project and future assessment items, so do your best to network. The Honours Directors will judge whether the desired goal of engaging your Honours cohort and facilitating their interaction with the School community has been achieved.

Debriefing: The day you complete your service and engagement event, your group will meet with one or more of the Honours Directors to discuss how you prepared for the event (such as the problems you anticipated) and the success of your implementation. A key component of the successful completion of the task is reflection; your group should discuss how the event could have been improved, thereby providing guidance for future students who may engage in a similar activity. What else could you have done to build collegiality within your Honours cohort?

CRITERIA AND MARKING

Your performance will be assessed by the Honours Directors. To obtain a pass you must have been an active, equal contributor to all three facets of the successful Service and Engagement event. In the event a student does not actively participate in each aspect of a Services and Engagement event, they will fail this component of the course and their Honours grade will be withheld until they participate adequately in a subsequent event that has a position available. Which subsequent event you participate in will be determined exclusively by the Honours Directors, and may by necessity involve you working with students from a different Honours cohort, perhaps even after your own cohort has finished.

SECTION 8: BENCHWORK

Start: You can start immediately when you start honours after completing OH&S training. However, you should discuss with your supervisor what would be the best balance between library work and laboratory work during the early stages of your project.

End: Week 34

AIMS OF BENCHWORK

The scientific side of Biotechnology is built on the experimental testing of ideas, the generation of reliable data, and the analysis and interpretation of the results obtained. You must also develop laboratory experience with apparatus and equipment. The research topic is not designed only to give you laboratory experience. It is part of the research program of your supervisor(s), and will contribute (to a greater or lesser extent) to the advancement of scientific knowledge. While to some extent you are present in the laboratory to learn about research, your primary purpose is to contribute to your supervisor's research program. Your output by the end of the year should exceed that expected of a technician working on the same project, in terms of project design, results interpretation and communication of findings through the research report.

REQUIREMENTS

Before commencing benchwork you must:

- obtain the School safety handbook from the School/Laboratory in which you will be doing your work.
- prepare a research proposal covering your whole project, but with emphasis on your first experiments. This proposal must be submitted to, discussed with and approved by your supervisor.

During your benchwork your supervisor will assess:

- your enthusiasm and interest, including attendance and application to your work;
- your adherence to laboratory rules and safety procedures;
- your technical proficiency in handling chemicals and equipment and performing techniques;
- your ability to plan experiments properly, carry them out, analyse results and draw conclusions;
- your creative and constructive thinking and your initiative and independence;
- your ability to summarise your progress concisely and critically;
- your ability to keep complete, neat and accurate records of experimental work in experimental notebooks;
- your ability to work as a member of a research team and to learn from others in the laboratory.

Your supervisor will factor these considerations into the final mark they provide through a supervisor's evaluation form.

The supervisor's evaluation report and mark will carry the same weighting as the examiners marks for your final report (that is, your supervisor mark/100 will be added to each of your examiners marks/100 for your final report and the total divided by 3 to give your overall % mark for the #10 of your final report). Hence your supervisors mark and each examiners mark carries a weighting of #3.33 for the course.

Experiment notebooks are to be handed in (to your supervisor) at the same time your research report is submitted and on completion of your assessment they become the property of your supervisor. All work must be directly recorded into these notebooks, which may be inspected at any time by the supervisor. They must be kept up to date. The aim of an experimental notebook is for someone proficient in the field to be able to read your notes and understand what you have done (so as to be able to repeat your experiments) and the results you have obtained. Therefore notebooks must be logically organised, clearly written, accurately cross-referenced and complete. There are many ways in which experimental notebooks can be organised; you should discuss suitable schemes with your supervisor.

CONDUCTING RESEARCH

It is not possible to provide a recipe on how to do research. Your research should be shaped by a balance between your own ideas and initiative and your supervisor's guidance.

Early during your project you should discuss with your supervisor the scope and possible directions of your project, laboratory rules and manners, procedures for obtaining chemicals and lab ware, how to maintain and organise experimental notebooks.

During your research you must ensure regular consultation with your supervisor - to approve work plans, to discuss results and progress, and to overcome any problems. Interacting with your supervisor and other members of your supervisor's laboratory will be one of your major opportunities to learn about scientific thinking.

NOTE: The data you generate is owned by the lab you work in. Costs for your research will be met by funds granted to your supervisor. If your supervisor does not sign off that he/she has received an adequate copy of all your data, (Lab notebooks, electronic and paper copy of your final report, and any other appropriate documents), then your final honours results may be withheld until such copies are provided. Your supervisor will sign off on this matter when they supply their supervisor's evaluation form to the Biotechnology Honours Committee.

SECTION 9: IP COURSE (RBUS6911)

RBUS6911 COMMERCE HONOURS SEMINAR

See Course Profile for RBUS6911. Biotech Honours students will complete this course as part of their honours studies. It is worth #2 (12.5%) of the overall honours assessment.

This course teaches Management of Intellectual Property.

- The mid-year students will need to do this course in the second semester of their honours year. This course will only be offered by UQ Business School in Semester 1 of each calendar year.

Attendance at the Workshop is compulsory and students are responsible for their own registration.

SECTION 10: RESEARCH REPORT

REQUIREMENTS

The research report will be written in the style of a mini-thesis, or a large publication. It must have no more than 8,000 words, excluding the abstract, references and table/figure legends. A word count must be listed in the title page and marks will be deducted if in excess of 8,800 words are submitted. If appendices are included, they must not form part of the word count and they will not be examined. Material essential for understanding the report must not be put in appendices. You can use appendices for providing extra background material or for supplying raw data if you think it is of some use, but examiners cannot be expected to review it in detail.

The research report will consist of:

- Title page: Project title, name of student, course, and word count.
- Abstract: No more than 1 page
- Contents: All chapter headings and subheadings. List of abbreviations.
- Introduction: Defining the scope and aim of the research project, in the context of the most relevant literature (must not exceed 1,500 words). This will be a reduced version of the original Research Proposal/Literature Review.
- Materials and Methods: Cultures, uncommon chemicals and equipment. Cite standard methods or methods published elsewhere, noting modifications. Otherwise the method should be described in full (possibly in an appendix if the method takes up a lot of space to describe but developing the method was not a key part of your project).
- Procedures/Results/Discussion: In any accepted thesis format.
- General Discussion: May be quite large if no discussion in previous section. May be absent if sufficient discussion in previous section.
- Conclusions: Concise summary of major findings (might be incorporated into discussion).
- Future work: Identification of further work required (might be incorporated into discussion).
- Full and accurate list of references (including titles of articles).
- Appendices: May or may not be necessary.

The report must be typed, or word-processed, in the standard page format specified earlier in this document, (*see Submission Procedures on Page 10*). For further ideas on organisation and presentation, consult past reports and theses.

Submit through the course Turnitin submission point in Blackboard as per the instructions provided under Submission Procedures on Page 10. Remember to hand in your experimental notebooks to your supervisor, at the same time that you submit your research report.

The report will be assessed on the basis of:

- your ability to organise information in a clear and logical manner;
- your communication skills: ability to write in good English. Your writing must be clear, concise and accurate (look up books on scientific writing);
- the quality of the work done. Given that in such a short research project significant positive results may be difficult to achieve, your approach to the problem is more important: it should be systematic, logical and compatible with good scientific method;
- your ability to: interpret data, draw conclusions, recognise the significance and potential applications of your findings, compare your work with that of others, discuss implications, show deficiencies and therefore highlight further work required.

MARKING

Your research report will be marked by the same two examiners that mark your Research Proposal/Literature Review. Your supervisor will not be one of the two examiners. The examiners will be provided with a copy of the instructions you have received and the following assessment guide. Your examiners may factor your performance in the final seminar into their mark for your research report. They will also be given the copy of your Research Proposal/Literature Review that they marked earlier, to remind them of the background to your report.

Class	Mark	Comments
I	> 80	Work of exceptional quality showing deep understanding of subject matter and clear appreciation of issues. Aims and hypotheses well formulated. Arguments highly logical, figures and diagrams clear and relevant, incisive selection and analysis of literature cited, strong evidence of creative ability and originality. Demonstrates high intellectual capacity and independence.
IIA	70-79.99	Work of high quality showing strong grasp of subject matter and appreciation of dominant issues though not necessarily of the finer points. Arguments forcefully developed. Relevant selection and analysis of literature. Evidence of creative ability and originality. Demonstrates solid intellectual capacity and independence.
IIB	60-69.99	Work of solid quality showing competent understanding of subject matter and appreciation of main issues though possibly with some lapses and inadequacies and with clearly identifiable deficiencies in logic, presentation or originality. Some evidence of creative ability. Written work carefully prepared and presented.
III	50-59.99	Adequate report showing some understanding of academic standards, but showing a minimal understanding of the research area with major deficiencies in the content or experimental rigour. Little evidence of creative ability or original thought. Sufficient to merit only a bare pass mark.
Fail	<50	

QUESTIONS TO KEEP IN MIND

Below are some questions the examiners of your research report will have in mind as they read your report:

- Is the topic clearly introduced and put into context?
- Is the aim of the research clearly stated?
- Is the need for the research clearly justified?
- Is the experimental strategy clearly stated? Was it appropriate?
- Were appropriate experimental methods used? Have alternative methods been considered?
- Does the student demonstrate awareness of the limitations of methods?
- Is any assistance the student obtained appropriately acknowledged?
- Are the results presented clearly and logically in an appropriate form?
- Has the student presented appropriately processed results?
- Are the important results highlighted and fully explained?
- Does the student understand and communicate the reliability of the results?
- Are the results related to the initial aims?
- Are appropriate conclusions drawn? Do the results support the conclusions?
- Are the results analysed in the light of relevant literature?
- Are shortfalls in the work identified and are important conceptual advances recognised?
- Are important unanswered questions identified and are useful future directions and experiments suggested?
- Are the work and ideas of others adequately referenced?
- Have you demonstrated intellectual originality, and the ability to think critically and clearly?

You should use these questions to guide you as you write. Keep in mind the following maxim: "Scientists do not so much have the responsibility to write so that they can be understood, but rather scientists must write in such a way that it is not possible to misunderstand them".

You are strongly advised to write drafts of sections of your research report and submit them to your supervisor during your benchwork. It is also a good idea to prepare copies of graphs for presentation in the report as soon as a set of complete data is available. The time available after you stop your benchwork does NOT allow you sufficient time to write a good research report if you start from scratch.

SECTION 11: RESEARCH SEMINAR

GENERAL

Two weeks after handing in your research report, you will present a seminar describing your research project. The ability to present your research work at scientific meetings is an essential part of your research training. Your second seminar will therefore be presented in the same way as a conference presentation. This means:

- You do not have to cram in everything you have done. You should give an overview of your work (highlighting your major results) or maybe give a more in-depth presentation of a crucial and self-contained sub-section of your work. The main aim is to have a clear message that you want to communicate to your audience.
- The audience will be from a variety of backgrounds, although you can assume that they all have a basic knowledge of biotechnology. You must try to communicate with the whole audience, not just members from your own sub-discipline.

The seminar will consist of a 15-minute presentation and 15 minutes for questions and discussion. You should time your presentation to go for between 14 and 15 minutes. If you go overtime then you will be cut-off in mid-sentence at 16 minutes.

NOTE: The seminar questions session is an opportunity for your Research Report examiners to gauge how well you understand your work, and it may influence the final mark they provide for your report

Assessment of the research seminar will be on the basis of:

- quality of content;
- clarity of presentation (both oral and visual);
- ability to handle questions and discussion;
- ability to communicate effectively with an audience of diverse backgrounds.

The final research seminar contributes 75% of your overall seminar mark for BIOT6121/BIOT6122. This represents 1.5 units of your overall honours assessment. It will be marked by members of the Biotechnology Honours Committee, with questions asked/supplied by the examiners assigned to mark your research report.

QUESTIONS TO KEEP IN MIND

Some of the questions your markers will have in mind are outlined below.

- Did the introduction clearly state the problem being investigated?
- How well was the problem put into context with background information?
- Was the structure of the talk made clear at the start?
- Was the need for the research work clearly justified?
- Were the experimental strategies explained at an appropriate level of detail?
- Was there an adequate balance between background and results?
- Was a coherent set of important results presented?
- Did the presentation finish clearly and concisely? Or did it meander about towards the end?
- Was the main message of the presentation clear? Was the whole presentation built around this main message?
- Were there sufficient visual aids?
- Did the speaker enunciate clearly? Was the speaker clearly audible?
- Did the speaker engender interest in the topic?
- Did the speaker avoid reading and distracting mannerisms?
- Was the presentation well timed, and presented at an appropriate pace?
- Did the speaker answer questions directly? Did the speaker answer the questions that were asked? Did the speaker seek clarification of what was being asked when appropriate?
- Did the speaker demonstrate a deep understanding of the research area through their answers to questions?

SECTION 12: ADMINISTRATIVE DETAILS

ADMINISTRATION OF BIOTECHNOLOGY HONOURS

The Honours program for the Bachelor of Biotechnology is administered by the Board of Studies in Biotechnology, chaired by the Associate Dean of Studies (Teaching & Learning) from the Faculty of Science. The Board appoints an honours subcommittee with representatives from relevant departments.

The Biotechnology Honours Coordinators are responsible for routine administration of the honours program and should be your first contact for enquiries or problems:

Dr Steve Reid	Prof Ross Barnard
Office: Chemistry (68) Rm-324	Office: Chemistry (68) Rm-322
Phone: 07 3365 3991	Phone: 07 3365 4612
Email: steven.reid@uq.edu.au	Email: rossbarnard@uq.edu.au

To book an appointment with either Steve or Ross, please contact:

Be Dong (Biotechnology Administrative Officer)
Ph: 07 3365 6194
Email: scmbbiotechnology@uq.edu.au

Florence Amery (Biotechnology Administrative Assistant)
Ph: 07 3365 3815
Email: scmbbiotechnology@uq.edu.au

MARKS AND FEEDBACK

For each item of assessment, examiners fill in a mark sheet, with space for comments. You can obtain a copy of the comments from the Biotechnology Honours Coordinator, or an appropriate Honours Committee member.

POLICY FOR MODERATION OF HONOURS RESULTS

1. The honours subcommittee will meet prior to the final award of grades, and will moderate the grades according to the guidelines set out below.
2. Special attention will be paid to disagreements amongst examiners (i.e. differences in marks greater than 10) on either the Research Proposal or Research Report.
3. Moderation will apply to the overall mark (as a %), not to individual components of that mark.
4. Moderation will apply to the results of students whose marks fall within +/- 2% of a borderline grade mark.
5. Criteria which may be used for moderation
 - Perceived degree of difficulty of the project
 - Matters deserving of special consideration (medical, personal etc.)
 - Failure to meet submission deadlines
 - Pattern of marks (where there is disagreement amongst examiners)
6. Alteration of a student's grade as a result of moderation will be based upon the agreement of a majority of the subcommittee members.
7. Adjustment will occur by alteration of the total mark by a maximum of +/- 2%.
8. All records will show original and moderated marks.
9. Where moderation has resulted in the change of a student's marks, the reasons for such changes will be recorded.