



The University of Sydney

School of Biological Sciences

2009

Semester 1

**HONOURS
GRADUATE DIPLOMA
IN BIOLOGY**

INFORMATION FOR STUDENTS

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HONOURS AND GRADUATE DIPLOMA 2009 SEMESTER 1 CALENDAR OF EVENTS

Check 'hons' e-mail messages regularly for up-dated information regarding the following:

Wednesday 28 January	11am	Introductory Information Session
	1pm	Head of School's Lunch
	Afternoon	Excursion to Warrah Research Station Pearl Beach
Thursday 29 January		Return to Sydney
Friday 30 January		Visit Research Labs, organise desk space, keys, etc.
Monday 2 February	9am - 10am 10am - 11am	R&D Workshop I: Ilma Brewer Lab (A11) 1st Library Session: Troughton Room at Badham Library
	2pm - 5pm	Sampling Biological Systems Workshop Robert Brown Lab (A12)
Tuesday 3 February	2pm - 5pm	Constraints on Sampling Workshop Robert Brown Lab (A12)
Thursday 5 February & Friday 6 February	9am – 12noon OR 1pm-3pm	Faculty of Science Official Enrolment Rooms 250/251 Level 2 Carslaw Building
Monday 9 February	9am deadline	Electronic copy of R&D Proposal outline due
Tuesday 10 February	9am - 10am 10am - 11am	R&D Workshop II: Ilma Brewer Lab (A11) 2nd Library Session: Troughton Room at Badham Library
Wednesday 11 February	2pm - 5pm	Experimental Design & Analysis: applying the principles and process to your honours year. Robert Brown lab (A12)
Thursday 12 February	9am - 10am 10am 10.30am - 12.00	Literature Review Workshop: Ilma Brewer Lab (A11) Group Photograph Seminars/Intro to Powerpoint Presentations
	2pm - 5pm	Experimental Design & Analysis: critical appraisal of published work – is it flawed or flawless, and can you do better? Robert Brown lab (A12)
Wednesday 18 February	2.15pm – 5.00pm	Introductory Seminar (Old Geology A11)
Wednesday 25 February Friday 27 February	9am - 5pm	Animal Welfare Course (2 day course) Webster LT, Veterinary Science Conference Centre
Friday 6 March	*4pm deadline	Final R & D Proposal due
Monday 16 March	*4pm deadline	Statistical Analysis Assessment due
Monday 20 April	*4pm deadline	Literature Review due
Friday 21 August		End of Experimental Work for Full Year Projects Supervisors to enforce
w/c 31 August tba	<i>time tba</i>	Thesis Writing workshop
Wednesday 2 September		<i>Seminar abstracts due</i>
w/c 14 September	Details tbc	Final Seminar (venue tbc)
Friday 2 October		Deadline for handing in Draft Thesis to Supervisor
Wednesday 21 October	4 pm deadline	4 bound copies of your Honours Thesis to be submitted to School Office (A10)
Oct/November		Hons/GD students are required to make themselves available for interview at consensus meeting.

Note dates in your diary and observe all deadlines, in spite of other commitments, field trips *etc.*
Speak to Madeleine (Ext 18779), as soon as possible, if you can see problems ahead.

OBJECTIVES OF THE HONOURS AND GRADUATE DIPLOMA

Biology Honours

During the Honours year the principles established in the first three years of the undergraduate course are further developed, and students are introduced to a wider field of biology and biological techniques. Students may elect to specialise in any of the aspects of biology that are studied in the School. A major component of the Honours year is a supervised program of individual research that results in the completion of a thesis.

Graduate Diploma in Science

The Graduate Diploma program in Biology is available as a one-year full-time, or two-year part-time course, subject to approval by the Head of School and the Dean.

The course is intended for students wishing to progress beyond a pass degree but not *via* the honours degree, or who are ineligible for admission to honours. Students enrolled in the one-year course will follow the same program as Biology honours students and be assessed using similar criteria. Students may therefore elect to specialise in any area within the research interests of the School. Projects jointly supervised by staff in other schools or departments within the University may also be considered. Students undertaking the two-year course (part-time) will follow the same curriculum but will satisfactorily complete the instructed elements of the course before progressing to the project element at the end of the first year. As with Honours, a major component of the Graduate Diploma program is a supervised program of individual research that results in the completion of a thesis.

The Honours/Graduate Diploma program is a concentrated problem-solving exercise using skills, knowledge and understanding obtained in earlier years and developed during the process of a research project in which the logical basis of scientific research is applied to a biological issue. The course comprises one literature review, one thesis and a Scientific Research Practice in Biology Course Work Unit. Students also present two short seminars (which are not assessed).

The Honours/Graduate Diploma course has five aims:

- 1) train students to carry out independent research
- 2) enable students to develop a specialist understanding of one area of biology
- 3) integrate specialist knowledge into a broad appreciation of biology
- 4) enable students to research biology using skills in research philosophy and methodology
- 5) engender and encourage enthusiasm and curiosity in biology

Aims will be implemented by ensuring that students are able to achieve the following by the end of the course:

- 1) Demonstrate an understanding of scientific methods of inquiry. This includes the identification of assumptions and limitations of scientific methods of inquiry. Where appropriate, it involves accurate measurement and the use of replicated, controlled experimentation.
- 2) Distinguish original from second-hand information, facts from opinions, and hypotheses from substantiated conclusions; identify the need for and role of appropriate evidence in supporting or falsifying testable hypotheses or points of view, separating pseudoscientific from scientific evidence.
- 3) Identify problems, perceive associations and construct relationships that may be novel in the chosen field of research. This may involve the development and practice of methods used in the field.
- 4) Demonstrate the ability to ask relevant questions for further research in a chosen field.

We assume that students enrolled in the Honours/Graduate Diploma year have attained a high standard of understanding of general biology as well as some specialised understanding in the field in which the research topic is based. More specifically, we assume that the following objectives have been attained. Where appropriate, students are able to:

- 1) use numerical data effectively to provide support for conclusions.
- 2) recognise the misuse of numerical data.
- 3) identify assumptions and limitations in problem solving and evaluate the adequacy of the approach of self and others.

Additional information about the School of Biological Sciences and Research Interests of the Staff is available on the worldwide web site: <<http://www.bio.usyd.edu.au>>

Variations for Part-time Graduate Diploma Students

- 1) Duration:** The part-time Graduate Diploma requires 2 academic years to complete and contains all the elements of full-time Graduate Diploma and Honours studies. Part-time studies begin at the same time as the full-time students and must be completed at the same time as full-time studies in the following year.
- 2) Course Work Unit:** Part-time students are required during the 1st year to take one course work unit:
Scientific Research Practice in Biology
- 3) Research Project:** Your experimental work can be initiated as soon as your proposal has met with the approval of your Supervisor(s). This will normally be before the end of the second semester of your enrolment. Progress, presentation and assessment of the project will then be as for full-time students.

GENERAL INFORMATION

GETTING STARTED

- Keys:** **A08/A12: Keys and Swipe Cards**
Supervisors are responsible for organizing building/laboratory access keys and/or swipe cards.
- M/A Tea:** Morning/afternoon tea times are good occasions to interact with staff and research personnel. You provide your own coffee, tea, milk and sugar.
Heydon-Laurence Building (A08) Tea Room: 11.00 am and 4.00 pm.
Macleay Building (A12) Tea Room: 10.45am and 3.30pm.
- Permits:** Permits are required from the relevant authority for any student whose project necessitates the following:
1. working on a vertebrate animal
 2. working on a protected organism (plant or animal), and
 3. working in a National Park, or other protected or restricted area.
- If your project involves any of the above 3 classifications, you need to discuss this matter with your supervisor and arrange for appropriate permits to be obtained.*

KEEPING IN TOUCH

- Notices & Circulars:** The most common mode of School communication is via e-mail.
Personal correspondence will be delivered to mail outlets, and general announcements will be either circulated by email or placed on notice boards in the Heydon-Laurence and Macleay Buildings. Please check the appropriate mail outlets and notice boards regularly.
- E-mail/Web** All University of Sydney students are supplied with a USydNet email address; details are printed on the bottom of the enrolment form. Please pass on this information to the honours administrative co-ordinator so that you can be added to the internal emailing list.
To activate your email account "log in" to "MyUni", the University Intranet. This service provides resources such as access to libraries, student services, software, and staff directories etc.
The School of Biological Sciences web site provides students with invaluable information to assist with their studies and School administrative procedures. <<http://www.bio.usyd.edu.au>>.
Any problems or advice regarding the School network, use of the School computers etc, contact the School's Computer Systems Officer.

- RESOURCES AND FUNDING:** Funds have been set aside for each student in the supervisor's infrastructure account to help cover research and other expenses e.g. chemicals, laboratory consumables, fares, photographic paper, etc. These funds are very limited and are made available to your supervisor to support each Honours/Graduate Diploma student. You should consult your supervisor about any expenses BEFORE they occur and obtain the permission of your supervisor in every instance. Note that each student is still responsible for the costs of typing, printing/photocopying and binding of his/her own thesis.
- Students may not order anything on the Honours account without a signature from the Honours Executive Officer. Your supervisor's signature will not do

Lab & Field Consumables: Items must be requested on a School Order Form and signed by your supervisor.

Stationery: You should discuss your needs with your supervisor.

Vehicles: Honours/Graduate Diploma students should familiarize themselves with School regulations regarding vehicle use. Information is listed on the following web-site:

<<http://www.bio.usyd.edu.au/SOBS/ADMIN/PROCESS/janice.html#drivers>>

- Students **MUST** obtain supervisor's permission to drive School vehicles
- Students **MUST** hold a driver's licence valid for NSW
- Students may **ONLY** drive one of the School's station wagons between 5.00pm on Friday and 9.00am on Monday.
- Students **MAY NOT** drive one of the 4WD vehicles **UNLESS** they are able to provide proof of successful completion of a driver safety course. The University does not finance attendance at such courses for fourth year students.
- Vehicle bookings can only be made on the School's booking website.

Photocopying: Unless you have a special arrangement with your supervisor, photocopying in the University libraries is your responsibility. Within the School buildings there are a variety of copiers for your use. You must obtain your supervisor's permission.

SERVICES

Post: Internal and external post is collected from Heydon-Laurence (A08) and Macleay (A12) every day. Incoming post is distributed twice daily. Honours/Graduate Diploma students will need to get their supervisor's permission if they wish to use School letterhead or post mail at the School or supervisor's expense.

Technical Services: Technical Services is located in the Annexe, at the back of Macleay Building, (A12). Limited work can be done for Honours/Graduate Diploma students, if approved by your supervisor. If you (or your supervisor) feel that you may need the assistance of Technical Services' expertise, please arrange a meeting with the Technical Services Manager to discuss your particular project requirements.

Photography: The School's scientific imaging officer is available to advise and provide training for Honours/Graduate Diploma students. Please make an appointment (mrickett@bio.usyd.edu.au) to discuss your photographic requirements for your particular research project - photomicroscopy, scanning, thesis plate production, or to arrange access for specimen/setup photography, darkroom etc facilities.

HONOURS & GRADUATE SAFETY INFORMATION

In an Emergency call:

Security 1 3333,

Fire, Ambulance or Police 0 000,

Mobile Phone 112

Who is responsible for Safety?

EVERYONE – We all have responsibility for our own safety and the safety of others.

Remember that the development of safe working practices and good laboratory technique is an essential part of your training in Science, as an understanding of Occupational Health and Safety legislation and its application in the workplace.

OCCUPATIONAL HEALTH & SAFETY POLICY GUIDE

[<http://www.usyd.edu.au/ohs/policies/ohs/index.shtml>](http://www.usyd.edu.au/ohs/policies/ohs/index.shtml)

Remember the basics in a laboratory –<http://www.usyd.edu.au/ohs/policies/ohs/labsafety.shtml>

1. **NO EATING OR DRINKING EVER**
2. **Wash your hands** on leaving the laboratory, especially if you have been handling hazardous chemicals or microbiological plate
3. **Follow safety procedures.** Failure to observe these safety procedures could result in severe injury and will be treated as a serious offence by supervisory staff.
4. **Footwear** Shoes with closed in toes that are “fixed” to the foot (ie not slip-on shoes) to be worn at all times. Also consider other personal protective equipment as appropriate. This may include lab coats, gloves, respirators and eye protection. Think about long hair, hair scarves, belly buttons!
5. **Note the location** of the nearest fire extinguisher, fire blanket, first aid kit and telephone.

The First Aid Officer in your area:

A08/A10 Michael Joseph x 14098, room 227 A08

A11/A12 Malcolm Ricketts x 14097, room 137 A12

F07 Claudio Muhlrud x 12954, room 113, F07

Field Safety Guidelines (Field Safety Officer – Michael Joseph, ext: 14098)

<http://www.bio.usyd.edu.au/SOBS/ADMIN/2002/FieldSafety.htm>

Dive Safety Guidelines)

<http://www.bio.usyd.edu.au/Diving/index.shtml>

CHEMICAL SAFETY INCLUDES

- Chemical inventory
- Identification of hazardous substances
- Labelling of old and decanted chemicals
- Material Safety Data Sheets (MSDS)

CHEMICAL SAFETY TOOLS

- Chem AlertII available at [<http://www.usyd.edu.au/ohs/course-notes/chemalert.shtml>](http://www.usyd.edu.au/ohs/course-notes/chemalert.shtml)
- Guidelines for Working with Hazardous Substances
[<http://www.usyd.edu.au/ohs/policies/ohs/haz-subs/hazsubs1.shtml>](http://www.usyd.edu.au/ohs/policies/ohs/haz-subs/hazsubs1.shtml)
- Table of Incompatibilities of Common Chemicals
[<http://www.usyd.edu.au/ohs/ohs_manual/haz-subs/incompat.shtml>](http://www.usyd.edu.au/ohs/ohs_manual/haz-subs/incompat.shtml)
- Laboratory Safety Links
[<http://www.usyd.edu.au/ohs/ohs_manual/labsafety.shtml>](http://www.usyd.edu.au/ohs/ohs_manual/labsafety.shtml)

RADIATION SAFETY

Radioactive use training: The Occupation Health and Safety Unit of the University will hold a training course early in the year and again mid-year. This one-day course covers theory and practical aspects of radioactive source use and safety. All potential users of isotopes **MUST** attend. Details will be announced by email.

Experimental Proposals and Monitoring: Please see the Radiation Safety Officer (Michael Joseph) if you are planning to use isotopes. An experimental proposal will be required and exposure monitoring will be arranged.

Radiation safety links: <http://www.usyd.edu.au/ohs/ohs_manual/radiation.shtml>

HAZARDOUS IDENTIFICATION & RISK ASSESSMENT

<http://www.usyd.edu.au/ohs/ohs_manual/ohsrm.shtml>

HAZARDOUS WASTE DISPOSAL – Solvent Wastes

(Hazardous Waste Officer – Les Edwards, ext: 18941)

- Accumulate solvents in approved type 5L or 20L plastic drums available from the A13 Annex bunker.
- Must be labelled with University provided sticky label.
- Do not "cocktail" solvents – Refer to list of common incompatible chemicals
- <http://www.usyd.edu.au/ohs/ohs_manual/haz-sub/incompat.shtml>
- Special collections can be arranged for large numbers of solids, or if unsafe to move or decant liquids

Isotope wastes

- Isotope wastes both wet and dry require very special handling, storage and disposal
- Please consult your supervisor and the Radiation Safety Officer (Michael Joseph) if you are working with isotopes.
- Monitors with a dose scale are available in A11 (room 206) and A08.

Ethanol and Solvent Drums

- Ethanol in an enclosed container is potentially an explosive mixture
- No residual ethanol before disposal
- Empty container may then be placed in the large bins with lids off.

SHARPS

Large broken glass should be accumulated in a strong (usually metal) container such as a well-labelled bin. It should be emptied by you (or appropriate person) NOT the cleaners, straight into the large "dumpy bins"

Metal sharps (needles, scalpel blades, razors) must go in approved sharps containers then to yellow clinical waste bin outside A13 Annex bunker.

Non infectious Pasteur pipettes may be accumulated in strong orange juice type containers if no other sharps and labelled non-infectious.

Refrigerators: Should be marked "Not suitable for storing solvents". All refrigerators should be marked with signs indicating their use:

"No food or drink"

"Biohazard"

"Food and drink only"

"Caution Radiation"

Building Problems: General building maintenance matters such as floods, leaking roof, dripping taps, or electrical problems are the responsibility of Facilities Management Office.

- **Facilities Management e-service desk (FMO)** Service Desk: ☎ 17838
<<http://www.facilities.usyd.edu.au/afm/index.cfm>>

Check with Michael Joseph (ext: 14098) or **Mark Ahern** (ext: 14658) **before contacting FMO.**

ASSESSMENT ADMINISTRATION

The Honours/Graduate Diploma mark is awarded for the year's work.

80% is awarded for the thesis.

12.5% for the course work unit.

7.5% for the literature review.

The examining panel of each thesis determines the thesis mark and, at the candidate's consensus meeting, the panel may decide to ask questions of the candidate, with the sole purpose of determining whether a higher mark should be awarded.

All Course Work Unit assignments are assessed by more than one academic. The literature review is assessed by the thesis examiners. Penalties apply to all late assignments.

All marks are totalled for each student, checked by the Examinations Committee and submitted to Faculty. The grade awarded is according to Faculty regulations.

Honours students obtain First Class Honours if their Honours performance justifies an Honours mark of 80 or greater.

While a department might release raw marks or progressive assessment scores, the only official result is the final result. The final result can be modified at both Departmental and Faculty levels before being released officially by the Registrar.

EXTENSION OF DEADLINES & REQUESTS FOR SPECIAL CONSIDERATION

If a student has any reason that they consider will adversely affect his or her ability to meet a deadline, the Honours/Graduate Diploma Executive Committee will decide on the response to requests for Special Consideration. Students seeking Special Consideration should inform the chair of the Honours/Graduate Diploma Committee of any circumstances that may affect their submission of work well before the due dates. It is not unusual for there to be catastrophic acts of misadventure during the honours year which may include, but are not limited to, loss of experimental material due to equipment failure, bushfires and floods that impact study sites, inability to complete work due to faulty reagents/equipment. These cases are handled individually by the chair of the Honours/Graduate Diploma Committee, and should be kept informed of all misadventure during your honours year.

Procedure for Submitting a Special Consideration:

Submit all documentation directly to Ros Malin (A08), NOT the Faculty Office.

Complete the Special Consideration form, and attach the appropriate detailed and signed Professional Practitioner's Certificate, and/or statement of misadventure from your supervisor. The chair of the Honours/GD Committee will notify you and your supervisor of the outcome. The Special Consideration application and Faculty of Science policy information can be downloaded from the following web-site

www.science.usyd.edu.au/fstudent/postgrad/pdf/special_consideration_application_pack.pdf

GUIDELINES FOR COURSE WORK UNIT & SEMINARS

INTRODUCTION TO ANIMAL WELFARE COURSE

Students who will be undertaking research experiments using animals or animal tissue, for which ethics permission is required, MUST enrol in the Introduction to Animal Research course. The course runs for 2 days and is conducted by the University Animal Ethics Committee.

Dates: Wednesday 25 and Friday 27 February 2009.

Venue: Webster Lecture Theatre, Veterinary Science Conference Centre

Animal Ethics Infolink website: www.animaletics.org.au

BIOL4015 SCIENTIFIC RESEARCH PRACTICE IN BIOLOGY

BIOL4015 is part of the required coursework for Honours/Graduate Diploma in Biology.

Aims/Goals: *To develop competence in, and an understanding of, scientific rigour in conducting and communicating biological research.*

A graduate Biologist must be conversant with a wide range of analytical techniques, including quantitative analysis as well as being able to communicate effectively about their research. Students must understand the logical structures that underpin analytical techniques, be able to design experiments based on understanding of biological processes and document their intended research. This course work unit provides the core skills and techniques that will equip students to perform a broad range of laboratory and field studies in biology, develop critical thinking and clear communication skills. Students will be introduced to the appropriate methodologies for data collection, handling and analysis that underpin the successful testing of biological hypotheses, and document their intended research as a grant proposal.

Staff

Assoc. Prof. Madeleine Beekman (UEO), Macleay Building A12/room 249

☎ 02 9351 8779; Email mbeekman@bio.usyd.edu.au

Assoc. Prof. Frank Seebacher Heydon Laurence Building A08/room 413

☎ 02 9351 2779; Email fseebach@bio.usyd.edu.au

Assoc. Prof. Ross Coleman (Deputy UEO), Old Geology Building A11/room 105

☎ 02 9351 2039; Email ross.coleman@bio.usyd.edu.au

Dr Clare McArthur, Heydon Laurence Building A08/room 303

☎ 02 9351 2062; Email claremc@bio.usyd.edu.au

Assessments

Background material relating to the coursework unit components (BIOL4015) is available at the following web-site:

www.bio.usyd.edu.au/honours/current_hons.html

1. Written Assignment

(25% of Unit mark)

Details will be specified at workshops.

Recommended Texts

- Dytham, C. (2003) *Choosing and Using Statistics: A Biologists Guide*. 2nd edn. Blackwell Publishing, Oxford.
- Field, A. (2005) *Discovering Statistics Using SPSS*. 2nd edn. SAGE publications, London.
- Pechenik JA. (2001) *A Short Guide to Writing About Biology*. 4th Edn. Addison Wesley Longman, Sydney.
- Ruxton, G.D. & Colegrave, N. (2003) *Experimental Design for the Life Sciences*. Oxford University Press, Oxford.
- Underwood, A.J. (1997) *Experiments in Ecology: Their Logical Design and Interpretation using Analysis of Variance*. Cambridge University Press, Cambridge.

2. Research & Development Proposal

(75% of Unit mark)

Research grant proposal based on your Honours/GD project. Formative assessment and feedback on the draft will be provided by your supervisor(s) and research group/research lab. The final iteration of the proposal will be assessed by the student's respective assessment panel.

LIBRARY INFORMATION & SERVICES

Badham Library, located opposite the Holme Building in Science Road, has an extensive collection of Biological Science resources and will be the main library you will use for your information needs in the Biological Sciences. A specialist Biological Sciences Librarian and is available to assist you with your research and guide you in selecting and using appropriate resources, including databases. Library staff can also assist you to set up alerts to keep you informed of the latest research in your area of interest.

Library services for Hons/GD Scientific Course Work students
Badham Library Training Room (Toughton Room - A16)
Monday 2nd, & Tuesday 10th, February (10am-11am)

EndNote training: EndNote citation management software and conducting advanced database searches will be covered in the above sessions.

You can access most databases and many e-journals from home if you are connected to the Internet. See details on the off-campus access webpages (URL listed below).

Useful URLs

Library catalogue: <http://opac.library.usyd.edu.au>

Badham Library: <http://www.library.usyd.edu.au/libraries/badham/>

Biological Science Library guide: <http://www.library.usyd.edu.au/subjects/biosci/>

Databases of particular interest to Biological Sciences students:
<http://www.library.usyd.edu.au/databases/biologicalsciences.html>

Contact details:

Faculty Liaison Librarians – School of Biological Sciences
Badham Library (A16), Science Road
Phone: 9036 9511 Fax: 9351 3852
Email: j.price@library.usyd.edu.au

SEMINARS

Introductory Seminar (12 min + 3 min for discussion)

All students will present a seminar outlining their proposed research project, approximately four weeks after the commencement of Honours/Grad. Dip. Each speaker will be allocated 15 minutes (12 minutes presentation, 3 minutes discussion).

Students must discuss the seminar with their supervisor(s) and practise the presentation (other students will probably help with this). If any student is unhappy with their preparedness, or if the supervisor(s) is less than helpful, the student should consult a Honours/Graduate Diploma Committee member, who will organise further help from a group of staff willing to give advice.

Final Seminar (12 min + 3 min for discussion)

Each student will present a seminar summarising their completed research (approximately 5 weeks before submission of the thesis). The seminar will be conducted in a conference format and an **abstract** (see example) must be provided for circulation prior to the seminar (refer calendar of events). An email will be circulated giving details where to send your abstract prior to the due date.

The final seminar has three important goals:

- to provide a forum for clear oral communication of your research findings
- to inform the School of your work
- to help focus your ideas for writing the thesis

Guidelines for Seminar Presentations

(refer also to the notes from the oral presentations workshop)

- 1) A good seminar requires considerable planning, preparation and rehearsal. You have a limited time to explain the basic features of your research, and why the answers you seek are of interest. Do not spend this time on intricate details of laboratory procedures or repetitive slides of your study area. Do not assume your audience already knows what your study species looks like, where it occurs, or the ultimate purpose behind your investigations.

Consult your supervisor (and anyone willing to help) for criticisms and suggestions.

Many students fail to introduce their topic adequately, and the audience is immediately plunged into methodology without understanding the basic point of the study. Your audience may not be familiar with established methods and jargon in your particular field, so define unfamiliar terms. Present a clear set of aims for your study.

- 2) Write out the major points you wish to convey to the audience. Make sure they are in a logical order. Decide how important each is, and what proportion of the available time should be spent on each one.
- 3) Try to speak from brief notes or overheads/slides, rather than reading a prepared speech.
- 4) Check that overhead transparencies or slides are of sufficient size and clarity when projected. Do not include too much information on each overhead. Leave overheads/slides visible for long enough for everyone to read them. It is well worth taking trouble with your visual aids. Check the lecture theatre audio-visual technology in advance.

There are some excellent web sites on PPT presentations. Have a look at:

<http://subjunctive.net/klog/2007/09/chicken/>

<http://www.swarthmore.edu/NatSci/cpurrin1/powerpointadvice.htm>

Guidelines for Writing Seminar Abstract

Name

School of Biological Sciences, University of Sydney, NSW 2006

Books of abstracts produced for conferences and other meetings usually aim for a consistent standard of production. To assist you in preparing your own abstract, this abstract has been written in a format that you are advised to follow.

The title should be written in BOLD type (12 point) at the top. Leave a line before writing your name, immediately below type your address (i.e. School of Biological Sciences, University of Sydney, NSW 2006). Leave another line before beginning the abstract itself. The text font should be Times, 12 point.

Paragraph alignment should be 'justified'. Italicise species names, giving common names (where available) at first mention. Avoid giving the results of statistical tests, their associated probability values, and references in the abstract unless absolutely necessary. Abbreviations may be used but should be defined at the first usage; this should not be necessary if abbreviations are well known (for example, DNA).

The abstract should describe briefly the background and aims of your project, the major methods you used, and the results. You should also provide brief discussion of your findings and a conclusion. The abstract should be descriptive rather than indicative. For example, it is better to write. "The analysis showed that A was larger than B, thus supporting the original hypothesis" than it is to write... "A and B were analysed and the results will be discussed".

Finally, you should be able to write an informative abstract in 300 words or less.

Good Luck!

RESEARCH COMPONENTS: LITERATURE REVIEW AND THESIS

Literature Review

(7.5% of Unit mark)

While preparing your Research and Development (R&D) proposal you have started reading literature relevant to your research project. You used this knowledge to write the background for your R&D proposal. Here you expand on this and write a literature review that places your research topic in a broader context. Your review should not be a summary of what has been published on your topic in the past. Instead you will write a synthesis of the literature relevant to your research topic. This literature review forms the basis of the general introduction to your thesis. The amount of 'tweaking' you will need to do when writing the general introduction to your thesis depends on how much your research has changed since finishing your review.

The following guidelines for writing a literature review set out the formatting style of an 'Opinion' article as published in *Trends in Ecology and Evolution (TREE)* (note that almost all Life Science disciplines have a dedicated *Trends* journal although not all of them publish 'Opinion' articles).

Instructions for Authors – *TREE* Opinion articles

Trends in Ecology & Evolution (TREE) is a journal of news, review and comment, designed to help a general audience of ecologists and evolutionary biologists to stay abreast of current trends throughout the field. Please follow these instructions carefully, because our editorial policy differs in important respects from that of primary research journals:

General Considerations

A *TREE* **Opinion** article should present a personal, very authoritative, viewpoint on a research-related topic, rather than a balanced review of this topic. The aim should be to stimulate debate or new research. They can cover very timely controversial topics, provide a new framework for, or interpretation of, an old problem or current issue, or speculate on the implications of some recently published research or data (that merits a more in-depth discussion than that provided by other sections).

Opinion articles will often, although not always, be based on recent research. Although the subject area need not be generally timely, some aspect of the subject should be highly topical e.g. new data that renew interest in a specific controversy or debate. Articles that merely outline recent advances in a field rather than give a strong *opinion* on them are not suitable for this section of the journal (more suited to the Review section).

In particular, to maximize the impact of their article, authors should bear in mind the following considerations:

- Start with a strong introduction outlining the timeliness, importance and rationale behind your article (why the subject is important, why now).
- Finish with clearly stated conclusions, including an indication of expected developments in the subject and the direction that future research should take.
- Do not include unpublished data, formal models or meta-analysis. Very very occasionally, unpublished data can be referred to, but only when absolutely essential; they should be clearly identified as unpublished and never be used to substantiate any significant point.
- Although subjective, an opinion article should not be used to dwell excessively on the author's own research or excessively criticize others', except where criticism is constructive.
- We encourage the use of straightforward illustrations, simple tables and short boxes to enhance the message of the main text.

Your readers will range from student to professor, so when writing for us, please aim to make your **Opinion** accessible to the entire readership of *TREE*. You can assume that your audience is competent in the basic language of the subject, but may require explanation or definition of technical terms, concepts and assumptions specific to your topic. Avoid jargon, but do not oversimplify or cut corners: be accurate and precise throughout.

Specific Guidelines

To help you prepare your article, please take careful note of the following guidelines. Those given under the 'optional' section are available for use if you wish. Marking criteria instructions are also listed to assist you with your review.

Title	<ul style="list-style-type: none"> • Titles should be short and enticing • No more than eight words. • Avoid very specialist terminology.
Authors names	<ul style="list-style-type: none"> • Not relevant
Abstract	<ul style="list-style-type: none"> • Briefly explain the necessary background. • Encapsulate the main conclusions for a non-specialist readership. • Emphasize the opinion you are trying to put forward. <p>Between 100 and 150 words.</p>
Teaser	<p>In addition to the Abstract, all Opinion articles should include a very short 'teaser', which will be used to convey rapidly to the reader why the article is relevant and interesting. The teaser should be a short, single sentence (20-35 words) - the equivalent of the first sentence of a news report - and will appear under the article's title in BioMedNet's e-mailed tables of contents, newsletters and such. It should be a simple statement highlighting your article and, importantly, your opinion, not a comprehensive summary of the work.</p>
Opinion structure	<p>To help guide the reader through the article, your 'Opinion' should follow the basic structure outlined below:</p> <ul style="list-style-type: none"> • Start with a short introduction aimed at nonspecialist readers. • Use subheadings to guide readers through the article. • End with a strong take-home message, including an indication of future directions.
Length	<ul style="list-style-type: none"> • Opinions must be between 1500 and 2500 words max. (2500 words (including spaces) is approximately 7 pages, single space.) • This word limit does not include text in boxes, reference list, tables or figure legends.
References	<ul style="list-style-type: none"> • The reference list should not be exhaustive – it should simply alert the readers to the key literature on which your opinion is based. • Reviews should be cited if necessary to refer to older data.

Optional Guidelines

Figures*	<ul style="list-style-type: none"> • Use of clear figures is strongly encouraged. • Titles should be short and explanatory. • Legends must fully explain the figure without reference to the text
Tables*	<ul style="list-style-type: none"> • Require a single sentence title but no legend. • Abbreviations and full explanations should be footnoted (using letters).
Text Boxes*	<ul style="list-style-type: none"> • Didactic aids which should be used to display additional information that would interfere with the flow of the main text. • Ideal for providing explanations of basic concepts or theories, giving detailed mechanisms or discussing case studies. • Text Boxes can occasionally contain small figures and tables (with legend or title). • Maximum of 400 words per Box and 8 references (cited within the box - see checklist below). • No more than 3 boxes per article.
Conclusions /Outstanding Questions Box	<ul style="list-style-type: none"> • These can be summarized at the end of the article if desired. • Counted separately from Text Boxes (above). • Maximum of 200 words. • Only if necessary
Glossaries	<ul style="list-style-type: none"> • For use when Opinions contain extensive amounts of specialist language (for instance, terms unknown to senior undergraduates). • Counted separately from Text Boxes (above).

LITERATURE REVIEW MARKING CRITERIA

Objective: *To prepare a well-organised, clear, concise review of the literature on a topic selected by the student in consultation with the supervisor. The review should not be a mere précis of research papers, but a genuine synthesis of the literature. As a guide, the review should be prepared as an 'Opinion' article suitable for submission to a Trends journal germane to the research topic.*

Marking Criteria

First Class: 90-100

Full understanding of the topic and its importance to biology and the broader context. Evidence of conceptually sophisticated thinking e.g. by inclusion of personal views, connections with other subject areas etc. Arguments supported by evidence and examples.

Student will have consulted a wide range of appropriate sources. Appropriate referencing in a standard format with minimal errors. Use of original tables and figures to summarize data from multiple sources to support an argument.

Excellent overall standard of presentation, exhibiting a high standard of English and clarity of expression. Appropriate use of fonts and effects. Rich, flowing text, pleasure to read with minimal errors. Appropriate separation of text into sections/sub-sections.

First Class: 80-89

Student will have demonstrated substantial understanding of the topic area and its place in biological science. Critical evaluation and arguments supported by evidence and examples with some evidence of independent thinking. Evidence of consulting a range of appropriate sources which are appropriately referenced. No significant errors. High standard of presentation, exhibiting a good standard of English and clarity of expression. Appropriate use of fonts and effects. Writing is accurate.

Second Class: 75-79

Understanding of the topic demonstrated, but with limited evaluation of its importance. Restricted use of evidence and examples. Some errors. At least acceptable standards of English, but with ambiguities and awkward expression. Some attention to layout and formatting. References in text and bibliography correctly cited. Writing mostly accurate, but uninteresting.

Second Class: 70-74

Little understanding of the topic area demonstrated, with no attempt to synthesize. Review will be little more than a précis of research papers. Opinions expressed are likely to be directly taken from published reviews or papers. Occasional errors in facts. Limited reading with a short bibliography. In the main, references in text and bibliography are correctly cited. Poor layout and formatting. Basic use of reproduced figures and tables.

Third Class: 65-69

Limited understanding of the topic area. Frequent factual or other errors. Inadequate standard of presentation. Poor use of English and inappropriate use of fonts and effects. Writing has frequent ambiguities, errors of expression, verbose or too brief. Insufficient reading around the topic. Referencing contains errors. Almost no attempt to provide a logical structure. No evidence of independent thought.

Fail<65

Limited understanding demonstrated. Unacceptable standard of presentation, including use of English. Poor presentation, rushed and sloppy. No, or totally inadequate, reference to literature and other sources of information.

Honours/Graduate Diploma Thesis Guidelines

- Size of Paper:** A4
Margins: 25 mm for top, bottom and right margins; 35 mm for left margin
Typing: Black type on white paper; double spacing; one side of paper only; number pages (this is probably best done after typing, proof reading and collating); use font size 12.
Length: **75 text pages, excluding Abstract, Figures & References.** Do not number pages of Abstract, Figures, Tables, Plates and References. *Appendices are not included in the page count.* Penalties apply for excess pages.

The penalties incurred for theses over 75 pages are as follows:

<u>Text page length</u>	<u>total marks deducted</u>
76-80	1 mark
81-85	2 marks
86-90	4 marks
91-95	6 marks
95-100	10 marks
101-105	15 marks
106-110	20 marks
>111	25 marks

- Thesis Format**
- 1) Title Page - for format see previous theses submitted in the School.
 - 2) Table of contents.
 - 3) Acknowledgments
 - 4) Abstract - not to exceed one page.
 - 5) General Introduction
 - 6) Research Chapters*
 - 7) General Discussion
 - 8) Appendices: Methods may be expanded in the appendices.

*Students are strongly encouraged to write their research chapter(s) as manuscripts ready for submission to scientific journals. The journal chosen for the manuscript(s) chapter(s) shall be done in consultation with your supervisor(s). As there are many disciplines within biology, it is inappropriate to dictate a single journal, but you should carefully consider the journal.

The General Introduction Limited to 7 pages. It should set your thesis within the context of existing knowledge in the field and show evidence that you understand the broader implications of your work Your literature review will form the basis for this chapter.

The General Discussion Also limited to 7 pages. It should draw together your main findings and place them within the context of the field, showing how you have changed understanding and opened new avenues for future research.

Tables: Each table must have a self-explanatory title and number. If there is insufficient room for the legend on the same page as the table, it should go on a facing page. Rows and columns must be headed clearly; if symbols are used these must be explained at the foot of the table.

Each table (and figure) must be referred to in the text. Tables (and

figures) are to be inserted in the text on separate pages immediately following their first mention in the text.

Figures:

Each figure must have a title and number.

Axes of graphs must be labelled and marked in appropriate units. All symbols must be explained in the legend, or in a general key to figures.

The legend may include additional information to explain the figure. All diagrams and photos should have a scale or stated magnification where applicable. Diagrams and figures often save many words and are well worth the effort involved.

Each figure must have a title and number.

Axes of graphs must be labelled and marked in appropriate units. All symbols must be explained in the legend, or in a general key to figures.

The legend may include additional information to explain the figure. All diagrams and photos should have a scale or stated magnification where applicable. Diagrams and figures often save many words and are well worth the effort involved.

References:

Should be cited according to one of the accepted formats, using accepted journal abbreviations. Which format you use, is up to you - **consult your supervisor for advice** and be consistent. It is probably best to adopt the format in the Instructions to Authors in a reputable journal in your field of research, but if in doubt use the format adopted in the School of Biological Sciences Research Report. Try to find a reference-managing program. Endnote is free to students and the library conducts workshops on its use. For more information contact Library staff.

Appendices:

These can be used for inclusion of raw data, rather than putting it in the Results section, but inclusion of raw data is not always necessary. Complex mathematical formulae, calculations and extremely detailed methods, can be placed in an appendix, along with detailed statistical information. Some statistical results are, however, required in the body of the thesis. Consult your supervisor about the appropriateness of using appendices in your thesis.

General Thesis Information

- Proof Reading:** **Proofread** the typed draft very carefully yourself, and get someone else to do so if you can, to eliminate typographical and punctuation errors. Check the reference list against the text, and vice versa. (The reference you forget may have been written by your examiner). Errors are your responsibility and create an impression of carelessness. *Collation of the thesis is critical, make sure each section of the thesis is in the appropriate place.*
- Photographs:** For advice on all your research photographic/imaging requirements make an appointment with the School's scientific imaging officer, Malcolm Ricketts (ext. 14097). Don't leave this until the last minute.
- Thesis Preparation Costs:** Word processing computers are available for the use of Honours/Graduate Diploma students in the Computer Laboratory, Robert Brown Room, Macleay Building (A12). It is wise to begin compiling your thesis, essays etc. as early as possible. Keep the original and at least one copy of all data and text backed up at a separate location. It is your responsibility to produce the maps, diagrams etc required for your thesis. Note thesis preparation costs (including photographs, photocopying and binding) are the financial responsibility of the student.
- Thesis Binding:** Students have to submit **FOUR*** bound copies of their thesis to the School Office. Information regarding thesis binding will be emailed to all students later in the program.
*Remember to print an extra copy for any co-supervisor(s).
- Submission of Thesis:** Submit 4 bound copies of your thesis to the **School Office**, The Cottage (A10), Science Road before the deadline - 4.00 pm on the due date. If you are unable to deliver your thesis you are responsible for informing the honours coordinator who will be delivering your thesis. **Only one** person should bring the thesis to the School Office. All copies of the thesis must be delivered simultaneously, if they are not delivered simultaneously the time of delivery of the final copy shall be deemed the time that the thesis has been handed in. Your supervisor is responsible for informing the honours coordinator if the thesis will be handed in late or any other deviations from this procedure.
- Penalty for Lateness:** Late penalties are applied for every 24 hours, beginning at 4pm, at a rate of 0.5 marks for each of the first 3 days late, and by 1.0 mark for each day late thereafter. Work handed in between 4pm and 5pm will receive 0.5 of the penalty for 24 hours.

Any thesis attracting penalties in excess of 10 marks will be reviewed by the Honours/GraduateDiploma Executive Committee.
- Student Interview:** Honours/Graduate Diploma Students should make themselves available for the examiners consensus meeting to answer any queries the examiners might have. This will represent an opportunity for students to improve their final mark. Check with your supervisor the date, time and venue of your consensus meeting.

School of Biological Sciences Thesis Marking Criteria

OBJECTIVE 1: *To develop attributes of a creative, independent and effective research scientist. This objective is designed to assess the ability to manage a research project within the confines of limited time and resources including the student's initiative, perseverance, extent of assistance, extent of difficulties, and general research aptitude. This needs to be placed in the context of the difficulty of the project.*

Objective 1 is essentially a supervisor's mark and cannot be assessed by examiners under the marking criteria. Supervisors will apply the marking criteria when writing their reports, with examples supporting their suggestion. Then, during the interview, the examiners will question the student about their honours experience as it relates to this objective and derive a score without the supervisor present.

Marking Criteria

Note: Given the variation in the experimental approaches of the sub-disciplines of biology, assessing the degree of student input into his/her project needs to be sympathetic to that sub-discipline's experimental approach and the feasibility, or not, of allowing high order student input.

First Class: 90-100

Evidence of substantial and informed independent thinking e.g. by including own views; making connections with other subject areas etc. Completely self-motivated; works effectively both independently and in collaboration with others. Seeks appropriate support as necessary. Formulates problem prior to seeking advice. Is scrupulous in acknowledging support and contribution of others.

First Class: 80-89

Some substantially correct independent thinking. Generally self-motivated. Able to work well alone or in team. Seeks appropriate support as necessary. Acknowledges support and contribution of others.

Second Class: 75-79

Some individuality demonstrated, but not always used effectively. Works adequately on own or as member of a team. Seeks help when necessary. Does not always acknowledge sources of support.

Second Class: 70-74

Little individuality shown. Often relies on others for motivation or to ensure progress OR is reluctant to seek necessary help. Poor team member. Does not always acknowledge sources of support.

Third Class: 65-69

Only inadequate or inappropriate independent thought demonstrated. Depends on others for motivation or fails to seek advice where necessary. Fails to work as member of a team. Does not acknowledge support.

Fail <65

No evidence of independent thought. Fails to start or progress with tasks. Does not seek and/or benefit from help. Makes no contribution as member of a team. Does not acknowledge support and/or plagiarises.

OBJECTIVE 2

Conduct literature research to place the project in the context of the field.

Marking Criteria

First Class: 90-100

Full understanding of the topic and its importance to biology and the broader context. Evidence of conceptually sophisticated thinking e.g. by inclusion of personal views, connections with other subject areas etc. Arguments supported by evidence and examples.

Student will have consulted a wide range of appropriate sources. Appropriate referencing in a standard format with minimal errors. Use of original tables and figures to summarize data from multiple sources to support an argument.

Excellent overall standard of presentation, exhibiting a high standard of English and clarity of expression. Appropriate use of fonts and effects. Rich, flowing text, pleasure to read with minimal errors. Appropriate separation of text into sections/sub-sections.

First Class: 80-89

Student will have demonstrated substantial understanding of the topic area and its place in biological science. Critical evaluation and arguments supported by evidence and examples with some evidence of independent thinking. Evidence of consulting a range of appropriate sources which are appropriately referenced. No significant errors. High standard of presentation, exhibiting a good standard of English and clarity of expression. Appropriate use of fonts and effects. Writing is accurate.

Second Class: 75-79

Understanding of the topic demonstrated, but with limited evaluation of its importance. Restricted use of evidence and examples. Some errors. At least acceptable standards of English, but with ambiguities and awkward expression. Some attention to layout and formatting. References in text and bibliography correctly cited. Writing mostly accurate but uninteresting.

Second Class: 70-74

Little understanding of the topic area demonstrated, with no attempt to synthesize. Review will be little more than a précis of research papers. Opinions expressed are likely to be directly taken from published reviews or papers. Occasional errors in facts. Limited reading with a short bibliography. In the main, references in text and bibliography are correctly cited. Poor layout and formatting. Basic use of reproduced figures and tables.

Third Class: 65-69

Limited understanding of the topic area. Frequent factual or other errors. Inadequate standard of presentation. Poor use of English and inappropriate use of fonts and effects. Writing has frequent ambiguities, errors of expression, verbose or too brief. Insufficient reading around the topic. Referencing contains errors. Almost no attempt to provide a logical structure. No evidence of independent thought.

Fail < 65: Limited understanding demonstrated. Unacceptable standard of presentation, including use of English. Poor presentation, rushed and sloppy. No, or totally inadequate, reference to literature and other sources of information.

OBJECTIVE 3

Design experiments, generate results, collect data or develop novel models/algorithms using a range of techniques appropriate to the field.

Marking Criteria

First Class: 90-100

Scientific method followed when designing experiments and during data collection. When appropriate, states the null hypothesis and tests it with an appropriate statistical test. Description of methods is sufficient for the experiment to be repeated. No irrelevant material. Most experiments should be publishable in a relevant journal.

First Class: 80-89

Scientific method adequately followed when designing experiments and during data collection. Uses appropriate statistical tests correctly. Description of methods may not be completely clear but no significant errors. At least one experiment should be publishable in a relevant journal.

Second Class: 75-79

Scientific method satisfactorily followed when designing experiments and during data collection. Statistical tests may be inappropriately applied. Most relevant material described in the methods but some mistakes/irrelevant material. Experiments are sound, but unlikely to be publishable as is.

Second Class: 70-74

Scientific method passably followed when designing experiments and during data collection. Some significant mistakes or irrelevant material in the methods. Experiments will have some significant structural flaws.

Third Class: 65-69

Limited application of the scientific method to design of experiments and during data collection. Significant proportion of the methods missing or incorrect. Significant structural flaws in the experiments.

Fail<65

Did not follow the scientific method when designing experiments or result/data collection. Methods section is inadequate.

OBJECTIVE 4

Analyse and interpret the results with the appropriate statistical methods and present results in clear, instructive figures and tables.

Marking Criteria

First Class: 90-100

All relevant data correctly presented. Data presented are focussed on question/task with no irrelevant material included. An analytical/discriminating approach to the results/data, applying appropriate statistics. Full understanding of implications & limitations of the data. Table and figures are of publication quality for a journal appropriate to the field, self-explanatory and without errors.

First Class: 80-89

Appropriate approach to data analysis and interpretation with no significant errors. Table and figures are self-explanatory but may contain minor errors. Tables and figures adequate for publication after editing.

Second Class: 75-79

Most relevant material stated and focussed on question/task. Some mistakes/irrelevant material. Appropriate approach to most aspects of data analysis and interpretation. Table and figures are not self-explanatory but contain few errors.

Second Class: 70-74

Poor data presentation. Some significant mistakes or irrelevant material. Limited data analysis and interpretation. Table and figures are not self-explanatory and contain errors.

Third Class: 65-69

Data are missing or incorrect. Inadequate data analysis and interpretation. Table and figures may not adequately represent all the results/data and may contain errors.

Fail<65

No, or wholly inappropriate, data analysis and interpretation. Table and figures do not represent the results and do not follow scientific conventions.

OBJECTIVE 5

Prepare a critical discussion of the results in the context of the literature of the research area and assess the limitations of the research and the opportunities for further work that it provides.

Marking Criteria

First Class: 90-100

Full understanding of topic within wider context. Full critical evaluation with arguments supported by evidence and examples. Evidence of substantial conceptually sophisticated thinking e.g. by including own views; making connections with other subject areas etc.

First Class: 80-89

Substantial understanding demonstrated. Critical evaluation and arguments supported by evidence and examples. Some substantially correct independent thinking

Second Class: 75-79

Understanding demonstrated, but with limited evaluation and restricted use of evidence and examples. Full critical evaluation with arguments supported by evidence and examples.

Second Class: 70-74

Little understanding or individuality demonstrated. Critical evaluation and arguments supported by evidence and examples.

Third Class: 65-69

Severe lack of understanding. Only inadequate &/or inappropriate independent thought demonstrated

Fail<65 (Almost) no understanding demonstrated, or evidence of any independent thought.

OBJECTIVE 6

Prepare a well-organised, clear, concise thesis.

Marking Criteria

First Class: 90-100

Full understanding of topic within wider context. Full critical evaluation with arguments supported by evidence and examples. Excellent overall standard of presentation, exhibiting a high standard of English and clarity of expression. Excellent layout of material. Appropriate use of fonts and effects. Rich, flowing text, pleasure to read with minimal errors. Appropriate separation of text into sections, i.e. results are not described in the discussion.

First Class: 80-89

Substantial understanding demonstrated. Critical evaluation and arguments supported by evidence and examples. No significant errors. High standard of presentation, exhibiting a

good standard of English and clarity of expression. Good layout of material and appropriate use of fonts and effects.

Second Class: 75-79

Understanding demonstrated, but with limited evaluation and restricted use of evidence and examples. Some mistakes. Adequate standard of presentation of material using at least acceptable standards of English. Some attention to layout and formatting. Accurate, but uninteresting, but requires re-reading.

Second Class: 70-74

Little understanding demonstrated. Some significant mistakes. Basic presentation of material with barely acceptable standards of English. Poor layout and formatting. Basic use of appropriate visual material. Generally OK. May be ambiguities

Third Class: 65-69

Severe lack of understanding. Frequent mistakes. Inadequate standard of presentation. Poor use of English and inappropriate use of fonts and effects. Frequent ambiguities, errors of expression, verbose or too brief.

Fail <65

(Almost) no understanding demonstrated. Totally unacceptable standard of presentation, including use of English. A really poor presentation, rushed and sloppy.

HONOURS PRIZE CATEGORIES

JOHN H. ELLIOTT MEMORIAL PRIZE

Awarded annually to the honours student in the School of Biological Sciences who submits the best thesis on any aspect of animal biology, provided that the student's thesis is of sufficient merit.

WILLIAM JOHN DAKIN MEMORIAL PRIZE IN ZOOLOGY

Awarded annually on the recommendation of the Head of School of Biological Sciences for excellence in the subject of Zoology to a student gaining first class honours in biology.

PROFESSOR SPENCER SMITH-WHITE PRIZE

Awarded annually on the recommendation of the Head of the School of Biological Sciences, for greatest proficiency in the field of genetics in undergraduate biology honours, provided the student's work is of sufficient merit.

ILMA BREWER PRIZE

Awarded annually on the recommendation of the Head of School of Biological Sciences for excellence in any aspect of the subject of botany of plant sciences, to a student gaining first class honours in biology.

UNIVERSITY MEDAL

In order to qualify for the award of a University medal, it is necessary but not sufficient for a candidate to achieve a SCIWAM of 80 or greater and an Honours mark of 90 or greater. Faculty has agreed that more than one medal may be awarded in the subject of an Honours course. The relevant Senate Resolution reads: 'A candidate with an outstanding performance in the subject of an Honours course shall, if deemed of sufficient merit by the Faculty, receive a bronze medal'. Recommendations to award a medal to a student who satisfies these requirements must be accompanied by a brief statement outlining the basis for the claim that the student's performance is outstanding. This should include:

- (i) a written statement summarizing the evidence of outstanding performance during the Honours course (e.g. prizes, ranking of course and thesis marks) and of consistently meritorious performance throughout all undergraduate years;
- (ii) an academic transcript summarizing the student's undergraduate performance;
- (iii) any other relevant information that would help inform the examining committee.

Students with an Honours mark of 90 or greater and a SCIWAM 77 - 79 inclusive may be considered for the award of a university medal only if it can be demonstrated that their WAM was affected by sickness, misadventure, unusual workload or choice of units of study.