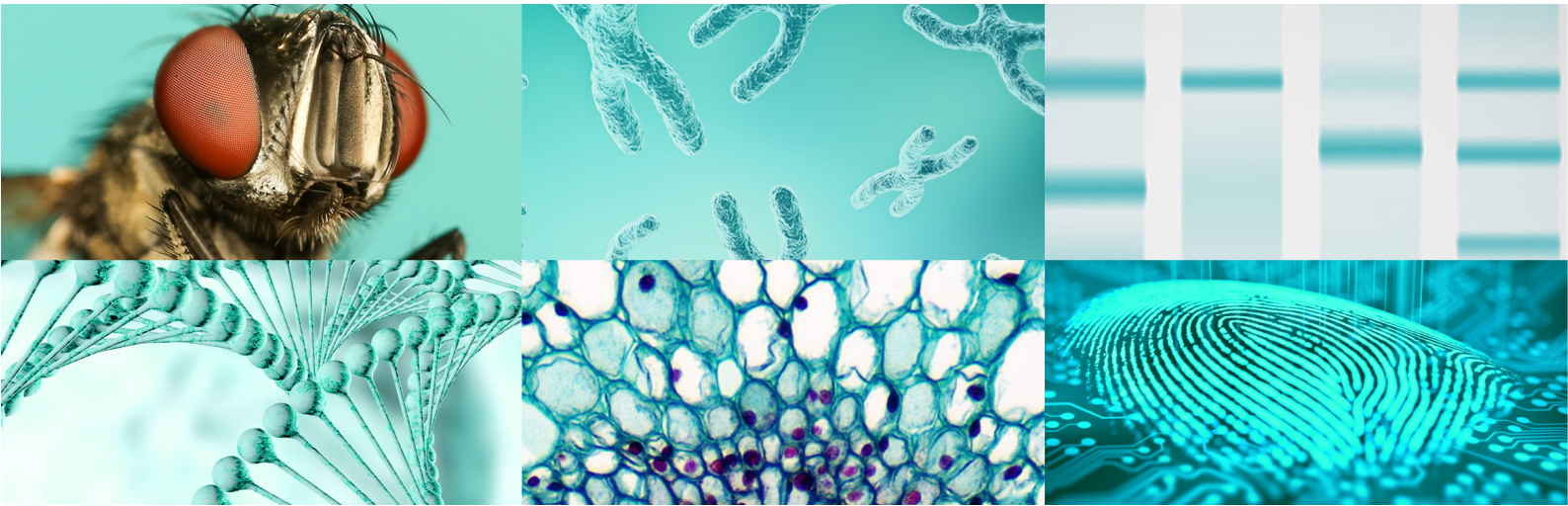




UNSW
THE UNIVERSITY OF NEW SOUTH WALES



BABS2204 and BABS2264
Genetics
Genetics (Advanced)

2020

Course Identity

Year of Delivery	2020
Course Code	BABS2204 / BABS2264
Course Name	Genetics / Advanced Genetics
Academic Unit	School of Biotechnology & Biomolecular Sciences
Level of Course	Second Year Undergraduate
Units of Credit	6
Session(s) Offered	2
Assumed Knowledge, Pre-requisites and Co-requisites	Pre-requisite: BABS1201 Assumed Knowledge: CHEM1011
Hours per Week	BABS2204: 6hrs BABS2264: 7hrs
Number of Weeks	10 weeks
Commencement Date	September, 2020

Staff

Course Coordinators	A/Professor Paul Waters Room 202A, Biological Sciences Building p.waters@unsw.edu.au Professor Bill Ballard Room 217A, Biological Sciences Building w.ballard@unsw.edu.au
Additional lecturers	Professor Mark Tanaka Dr Richard Edwards
Technical & Support Staff	Dr Gee Ling Room 130, Biological Sciences Building g.ling@unsw.edu.au
Administrative Staff	Julna Zhao BSB Student Office Phone: (02) 9385 8047

Course Resources

Textbook	<p><i>Introduction to Genetic Analysis</i>, Anthony Griffiths, Susan R. Wessler, Sean B. Carroll and John Doebley, 2015, 11th edition (W.H.Freeman)</p>
Course Website	<p>The BABS2204/2264 Moodle site contains links to resources, lecture notes and discussion forums where you can ask questions. Once you are enrolled, you can access the Moodle site at https://moodle.telt.unsw.edu.au/login/index.php Your username is your student number preceded by a lower-case z e.g. z1234567. Your password is your zPass.</p>
Course Manual	<p>A prac manual is required and available for download from the BABS2204/2264 Moodle site. Lecture recordings on Echo360 are also available via a link on the course's Moodle site.</p>
Additional Resources and Support	<p>There are many good alternative textbooks that deal with the aspects of genetics covered in this course. Since genetics is a complex and rapidly changing field, it is usually best to consult textbooks that have passed through several editions and that have been published and/or revised recently.</p> <p>Discussion forums will be established on the course's Moodle website and will be monitored regularly by staff working on the course. You will be able to ask any course-related questions on these forums, which will be divided into different topic threads (e.g. administration, lectures, and practicals).</p> <p>Demonstrators can help you integrate the lecture and practical material. Note that they are casual staff who are not paid outside class hours, so consult them <u>during</u> class.</p> <p>Lecturers are available for consultation. Enquiries or requests for appointments should be directed to the lecturer's email address from your UNSW email. Clearly state your name and student number and the course in which you are enrolled (i.e. BABS2204 or BABS2264). If you are asking for help with a question or problem, you should make a written attempt at the question (showing all of your working) and include the question and your answer with your email.</p>
Class Requirements	<p>For BABS2204 all practical classes will be delivered online: Students should read the relevant section of the prac manual in advance for each practical.</p> <p>You are expected to attend all practical classes online. If you are absent (e.g. due to illness), then you will need to provide your demonstrator with a medical certificate or other evidence explaining your absence. Demonstrators will take a roll at each practical and attendance of <80% may result in a Unsatisfactory Fail (UF) grade for the course.</p> <p>For BABS2264 practical classes will be delivered face to face. Students must additionally attend all research labs at their scheduled time and an attendance of <80% for this class may result in a UF grade for the course. Students should bring a laboratory coat, closed shoes and safety goggles. This is required by Occupational Health and Safety (OH&S) regulations, and you will not be allowed to participate in the practical (and will be marked absent) if you are inappropriately clothed.</p>

Course Outline

Course aim	To provide an introduction to genetics theory and practice.
Course Description	Genetics is the study of inheritance and is an exciting and rapidly expanding discipline with applications in medicine, biotechnology, agriculture and many other fields. This course provides an overview of the key concepts in genetics including gene structure and transmission, genetic variation, regulation of gene activity, genetic variation, mutation and evolution. Laboratory experiments and conference-style activities are used to demonstrate genetic theory and its application, and provide an introduction to real-world research in genetics.
Relationship to Other Courses Within the Program	Course pre-requisite: BABS1201 (Molecules, Cells and Genes) Assumed Knowledge: CHEM1011 (Chemistry A: Atoms, Molecules and Energy) Pre-requisite for: BABS3151 (Human Genetics) and BABS3291 (Genes, Genomes and Evolution)
Major Topics	<ol style="list-style-type: none">1. Genetics: definition and basic concepts2. Gene interactions3. Regulation of transcription in eukaryotes, including epigenetics4. Genetic control of development5. Genomes and genomics6. Large scale genetic changes7. Population genetics8. Inheritance of complex traits9. Evolution of genes and traits

Learning Outcomes

At the end of the course students should be able to:

1. Describe the major ideas and sub-disciplines in genetics.
2. Use genetic reasoning to solve relevant problems.
3. Accurately communicate genetics ideas.
4. Critically evaluate genetic information and arguments in both the scientific literature and the mainstream media.
5. Discuss the economic, environmental, social and other aspects of controversial issues in genetics.
6. Safely and effectively perform genetics experiments and critically analyse the results.
7. Analyse and report on complex genetics experiments using the scientific method (BABS2264 only).

Course Structure

Practical Classes	<p>Laboratory-based experimentation is an integral part of modern genetics. The practicals in this course are designed to provide you with an introduction to the techniques used in genetics research and are designed to complement the lecture series.</p> <p>There are goals for each individual practical class, and overall goals for each section (as detailed in this manual).</p>
Lectures	<p>Lectures serve to emphasize certain principles covered in the text, provide an overview and connect the individual components of the course. They may also discuss additional material that is not covered adequately (or at all) in the textbook, and will expose you to current ideas and research in genetics.</p> <p>The lectures provide a guide to the material that you need to cover for the course. Most lectures will follow the textbook (Griffiths), but you are encouraged to extend your knowledge by reading from a variety of sources.</p> <p>If you cannot attend a lecture you can still access lecture notes and recordings on the BABS2204/2264 Moodle site.</p> <p>Please note that the lecture notes and recordings are intended to be a resource for those who cannot attend a particular lecture. They are a poor substitute for attending lectures, asking questions and being involved in lecture activities, and you are strongly encouraged to attend all lectures.</p> <p>Some lectures will be pre-recorded, and the lecture slot will be used for students to ask questions about the lecture content.</p>

Graduate Attributes Developed in this Course

Science Graduate Attributes	0 = no focus 1 = minimal 2 = minor 3 = major	Activities / Assessment
Research, inquiry and analytical thinking abilities	3	<p>Guided laboratory practical work (both independent and collaborative) supporting an introduction to methods of enquiry in genetics taught in lectures. The course aims to enable students to:</p> <ul style="list-style-type: none"> • understand key concepts in genetics; • evaluate experimental data; • solve problems using the scientific method; • find and evaluate relevant scientific and non-scientific literature; and • communicate their work to others.
Capability and motivation for intellectual development	3	<p>The lectures place developments in genetics in their historical and social context and highlight the current rapid increase in genetics knowledge. This is reinforced in the laboratories, which give students the opportunity to develop their practical and problem-solving skills.</p>
Ethics, social and professional understanding	3	<p>Lectures discuss social, ethical, economical and professional issues surrounding current genetics research. This increases awareness and understanding of the problems associated with the dramatic increase in genetic information available in recent years.</p>
Communication	3	<p>Communication skills are developed by ongoing discussion and interaction with peers, demonstrators and lecturers during practicals, the production of a blog post (in BABS2204) and a scientific report (in BABS2264).</p>
Teamwork, collaborative and management skills	3	<p>All practicals involve pair and group work, and many extend across several weeks (which requires project planning and accurate record-keeping). Forums for group discussions are provided on Moodle and all course participants are encouraged to participate in these forums. Students enrolled in BABS2204 work in teams to produce a video. They are then required to reflect on the effectiveness of the team and their role in the process. All students in BABS2264 work as a team on a semester-long research project.</p>
Information literacy	3	<p>The research project for advanced students develops the ability to find and evaluate the relevant scientific literature when writing the report. Students enrolled in BABS2204 use both the scientific literature and the popular media to source information on a genetics topic, which they then evaluate and use to produce an instructional resource. The computer and bioinformatics practicals introduce students to applications and online resources that are commonly used in genetics research.</p>

Rationale and Strategies Underpinning this Course

Teaching strategies	<p>Lectures provide factual information and an introduction to genetics research. Laboratory practicals complement the lectures, provide practical experimental skills and encourage teamwork.</p> <p>Throughout the course, students are encouraged to develop problem-solving skills and to critically evaluate concepts, ideas and research results. The practical and assessment exercises have been designed in accordance with the UNSW Guidelines on Learning (http://www.guidelinesonlearning.unsw.edu.au) to:</p> <ul style="list-style-type: none">• demonstrate the process of scientific inquiry by encouraging progressive cycles of critical thought and evaluation;• facilitate multidisciplinary thinking, which underpins current research and professional practice in the sciences;• reinforce deep learning and promote collaborative inquiry; and• integrate disciplinary understanding and research practice with the development of communication skills, teamwork and information literacy. <p>These aims are achieved using a variety of assessment modes, including computer-based exercises, laboratory experiments, oral and virtual presentations and written reports.</p>
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Assessment Tasks and Feedback

Task / Knowledge and abilities assessed / Assessment Criteria	%	Date of		Feedback		
		Release	Submission	WHO	WHEN	HOW
Final Exam (BABS2204 & BABS2264)						
<p>Knowledge and abilities assessed: This examination will include multiple choice questions. Question will assess understanding as well as factual knowledge. For example, you may be presented with a complete genetics calculation and then asked to choose between several possible answers or interpretations; 2 hours in length.</p>	40%	Exams Branch timetable	Same day	Lecturer	Before end of year	Online results
<p>Assessment Criteria: Genetics knowledge and skills covered in lectures and practicals. Ability to solve novel genetics problems related to the material in lectures and practicals.</p> <p>The questions will be similar to those you have encountered in practicals, lectures, online quizzes, and at the back of each chapter in your textbook. Example questions may also be posted on Moodle.</p>						
Quizzes (BABS2204 & BABS2264)						
<p>Knowledge and abilities assessed: multiple choice and/or short answer questions on the lecture and practical content of the course.</p> <p>These quizzes are designed to keep you up-to-date with the lecture content</p>	30%	Every second week, starting in Week 2	Same day	Tutors	In quiz revision lectures	Feedback during quiz revision lectures, discussion with demonstrator.
<p>Assessment Criteria: Knowledge of genetic material delivered in lectures and pracs</p>						
Blog Post BABS2204 ONLY						
<p>Knowledge and abilities assessed: This exercise will assess your ability to analyse and present genetic information in a blog format. As an individual, you will prepare a blog to explain genetic concepts to a wider audience.</p>	30%	Week 2 during practical	Week 9, online only Moodle	Lecturers, demonstrators	Week 10	Online (Moodle), consultations.
<p>Assessment Criteria: Discovery and evaluation of the relevant scientific and non-scientific literature including the broader social or economic issues surrounding a genetics question.</p>						
Research Project BABS2264 ONLY						
<p>Knowledge and abilities assessed: You will have the opportunity to participate in a research project on evolution of fish.</p>	30%	Week 2 during practical	Week 9 during practical	Lecturers	Week 10	Online (Moodle), consultations with demonstrator and convenor.
<p>Assessment Criteria: Literature review of relevant research articles. Presentation of experimental results as a journal article</p>						

Laboratory Notebooks: You must keep a record of all your laboratory work in a digital or bound notebook. Questions in the practical manual should be answered in your notebook or in your practical manual. Demonstrators or lecturers may ask to inspect your notebook and manual at any time.

Absences, Special Consideration and Further Assessment

If you miss a practical class or assignment submission deadline, you may submit an application for special consideration and/or further assessment. Please follow the specific instructions below for each type of activity. In general, you will need to provide a reason for your absence or non-submission supported by documentary evidence (e.g. a medical certificate from a doctor or other health care professional). You will also need to submit the assignment as soon as possible. Note that special consideration and/or further assessment will only be granted for unavoidable absences (e.g. on medical or compassionate grounds) and will not be given for other reasons (e.g. work, holidays, travel). If you fail to submit an assessment item on the due date and do not provide a valid reason and documentation, then your final mark for the assessment will be reduced at a rate of **10% per day** (including weekend days). Note also that further assessment for any missed assessment item may take the form of a *viva voce* (oral examination). The procedures for applying for special consideration for each assessment item are detailed below.

Missed practical class(es): If you are absent from a lab class you must provide your demonstrator with a medical certificate or other professional documentation that supports the reason for your absence on the day of the practical. Demonstrators will record attendance at each practical.

If you miss more than 20% of practicals without an appropriate explanation and documentation (e.g. medical certificate), you may be given a grade of Unsatisfactory Fail (UF) because you have not completed the practical component of the course.

Missed quizzes: If you miss a quiz you must provide the course convener with a medical certificate or other professional documentation that supports the reason for not completing. Depending on their overall performance at the end of the course, students with compliant applications for Special Consideration will either receive an average mark for their missed test or will be invited to sit further assessment.

Blog Post (BABS2204 only): If you fail to submit the blog by the due date due to circumstances beyond your control you must contact the course convener(s) as soon as possible and supply a medical certificate (or alternative professional documentation).

Research report (BABS2264 only): If you fail to submit the report by the due date then you will need to submit it as soon as possible (with supporting documentation attached).

Final exam: These assessment items are worth $\geq 20\%$ of the course total. This means that you will need to submit an application for special consideration with appropriate medical or other professional documentation **WITHIN THREE (3) WORKING DAYS** as described below. Your application will be processed, and you will be notified via the online system. After the exam period, you will receive an email with details of any supplementary assessment.

Special Consideration and Further Assessment, T3, 2019

Students who believe that their performance, either during the session or in the end of session exams, may have been affected by illness or other circumstances may apply for special consideration. Applications can be made for compulsory class absences (such as laboratories), in-session assessments tasks, and final examinations.

You must submit the application prior to the start of the relevant exam, or before a piece of assessment is due, except where illness or misadventure prevent you from doing so. If you become unwell on the day of the exam or fall sick during an exam, you must provide evidence dated within 24 hours of the exam, with your application.

UNSW has a fit to sit/submit rule which means that if you sit an exam or submit a piece of assessment, you are declaring yourself fit to do so.

You must obtain and attach Third Party documentation before submitting the application. Failure to do so may result in the application being rejected.

Further information on special consideration can also be found at <https://student.unsw.edu.au/specialconsideration>.

HOW TO APPLY FOR SPECIAL CONSIDERATION

The application must be made through Online Services in [myUNSW](#) (My Student Profile tab > My Student Services > Online Services > Special Consideration).

Students will be contacted via *their official university email* as to the outcome of their application.

After applying online, students must also verify supporting their documentation by submitting to [UNSW Student Central](#):

- Originals or certified copies of your [supporting documentation](#) (Student Central can certify your original documents), and
- A completed [Professional Authority form \(pdf - download here\)](#).

The supporting documentation must be submitted to Student Central for verification *within three working days* of the assessment or the period covered by the supporting documentation. Applications which are not verified will be rejected.

Students will be contacted via the online special consideration system as to the outcome of their application. Students will be notified via *their official university email once an outcome has been recorded*.

SUPPLEMENTARY EXAMINATIONS:

The University does not give deferred examinations. However, further assessment exams may be given to those students who were absent from the final exams through illness or misadventure and received Special Consideration approval. Mid-term supplementary exam will be held during the term at the convenient period determined by the course convenor. Final supplementary exam will be run by The Exam Office and in supplementary exam period.

It is the responsibility of all students to regularly consult their official student email accounts and myUNSW in order to ascertain whether or not they have been granted further assessment.

For T3 2019, BABS Supplementary Exams will be scheduled on:

Monday 11 Jan – Friday 15 Jan, 2021

Further assessment exams will be offered during these days ONLY and failure to sit for the appropriate exam may result in an overall failure for the course. Further assessment will NOT be offered on any alternative dates.

Administrative Matters

Expectations of Students	<p>These courses are NOT offered in distance education mode. You are expected to attend ALL scheduled classes, tests and examinations. A pass in BABS2204/2264 is conditional upon a satisfactory performance in the practical program. This includes an 80% attendance minimum of the practical classes scheduled and, for BABS2264 students, 80% of classes in the research lab timeslot.</p> <p>It is important that you come prepared to the practicals having already read the appropriate sections of the textbook, lecture notes and the lab manual.</p> <p>You must be correctly attired for laboratory practicals (see below).</p> <p>You must keep a record of all your laboratory work in a bound notebook. Questions in this manual may be answered in your notebook or manual. Demonstrators or lecturers may ask to inspect your notebook or manual at any time.</p>
Assignment Submissions	<p>Details on assignment submission are given in the “Assessment Tasks and Feedback” table.</p>
Occupational Health and Safety	<p>Flat-soled, covered shoes and lab coats must be worn whenever you are working in the laboratory. Eating, drinking, using mobile phones and running are NOT permitted in the lab. Anyone who violates these regulations will not be allowed to proceed with the practical class.</p>

UNSW OHS policies and procedures (2001) stipulate that everyone attending a UNSW workplace must ensure their actions do not adversely affect the health and safety of others. This outcome is achieved through a chain of responsibility and accountability for all persons in the workplace.

This School has undertaken detailed risk assessments of all course activities and identified all associated potential hazards. These hazards have been minimised and appropriate steps taken to ensure your health and safety. For each activity, clear written instructions and appropriate hazard warnings or risk minimisation procedures are included for your protection. Refer to the Risk Assessment section in this manual for specific risks and hazards associated with the laboratory component of this course.

It is your responsibility to prepare for all practical work. You should be familiar with the procedures scheduled for the practical class and identify all personal protection requirements needed to complete the exercise in a safe manner. Material Safety Data Sheets (MSDS) are available from your demonstrator for any hazardous chemicals. At the commencement of each new practical your demonstrator will review any risks with you. It is essential that you are present at the beginning of each class to ensure that you understand any risks and can review the safety procedures. If you are not present you may be excluded from the class.

You must comply with all safety instructions and observe all safety notices. Failure to comply with safety instructions may be considered academic misconduct and may be investigated by WorkCover as a breach of the NSW OH&S Act (2000).

Following are some simple rules which will ensure good laboratory practice and minimise the consequences of risks:

- Wear adequate protective clothing including, when appropriate, gloves and safety glasses.
- Acquaint yourself with the safety equipment in the lab.
- Do not eat, drink, chew gum, apply make-up or similar in the lab. Do not bring food, drink etc. into the lab. Do not sit on laboratory benches. Set your mobile phones to silent mode, and do not use them during class.
- Long hair should be tied back.
- Do not invite anyone into the lab.
- Practice good aseptic techniques.
- In the event of an accident with a microbial culture, or hazardous chemical, ask a fellow student to call someone in authority immediately. Do not move and risk the spread of contamination. If there is a fire or you are at risk from a chemical spill, remove yourself from immediate danger and call someone in authority immediately.
- Dispose of all waste correctly.
- Label all materials correctly and place in the relevant containers provided.
- Operate all equipment carefully and correctly. If in doubt regarding the correct method of operation consult a demonstrator before proceeding.
- Keep your bench tidy during experimental work and clean up and disinfect your bench before leaving the laboratory. Ensure that you wash your hands before leaving.
- If you feel physical discomfort from your work or have an allergic reaction, consult your demonstrator or another person in authority.
- If you get any biological or chemical substance your eye, immediately go to a tap and wash your eye. While washing your eye, alert someone to your situation so that they can assist you and gain the attention of someone in authority. Continue to wash your eye until someone in authority indicates for you to do otherwise. Note that you should always wear safety glasses when handling hazardous substances

	<ul style="list-style-type: none"> Information on relevant OH&S policies and expectations at UNSW: http://www.ohs.unsw.edu.au/
Equity and Diversity	<p>If you have a disability that requires some adjustment in your teaching or learning environment, you are encouraged to discuss your study needs with the course convener prior to, or at the commencement of, your course, or with the Student Equity and Diversity Unit (02 9385 4734) or online at: http://www.studentequity.unsw.edu.au/</p> <p>Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.</p>

Academic Honesty and Plagiarism

Plagiarism is the presentation of the thoughts or work of another as one's own.*

Examples include:

- direct duplication of the thoughts or work of another, including by copying work, or knowingly permitting it to be copied. This includes copying material, ideas or concepts from a book, article, report or other written document (whether published or unpublished), composition, artwork, design, drawing, circuitry, computer program or software, web site, Internet, other electronic resource, or another person's assignment without appropriate acknowledgement;
- paraphrasing another person's work with very minor changes keeping the meaning, form and/or progression of ideas of the original;
- piecing together sections of the work of others into a new whole;
- presenting an assessment item as independent work when it has been produced in whole or part in collusion with other people, for example, another student or a tutor; and,
- claiming credit for a proportion a work contributed to a group assessment item that is greater than that actually contributed. †

Submitting an assessment item that has already been submitted for academic credit elsewhere may also be considered plagiarism.

The inclusion of the thoughts or work of another with attribution appropriate to the academic discipline does not amount to plagiarism.

Students are reminded of their Rights and Responsibilities in respect of plagiarism, as set out in the University Undergraduate and Postgraduate Handbooks, and are encouraged to seek advice from academic staff whenever necessary to ensure they avoid plagiarism in all its forms.

The Learning Centre website is the central University online resource for staff and student information on plagiarism and academic honesty. It can be located at: <http://www.lc.unsw.edu.au/plagiarism>

The Learning Centre also provides substantial educational written materials, workshops, and tutorials to aid students, for example, in:

- correct referencing practices;
- paraphrasing, summarising, essay writing, and time management;
- appropriate use of, and attribution for, a range of materials including text, images, formulae and concepts.

Individual assistance is available on request from The Learning Centre.

Students are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting, and the proper referencing of sources in preparing all assessment items.

Students who submit plagiarised work will be subject to penalties for academic misconduct.

* Based on that proposed to the University of Newcastle by the St James Ethics Centre. Used with kind permission from the University of Newcastle.

† Adapted with kind permission from the University of Melbourne.