

FACULTY OF SCIENCE
SCHOOL OF PSYCHOLOGY

PSYC3221
VISION AND BRAIN
SESSION 1 2012

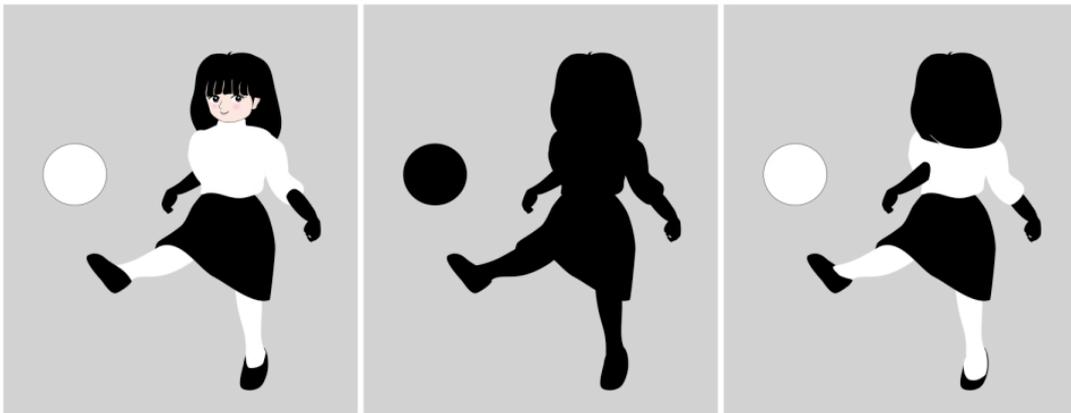


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1. Information about the Course

Year of Delivery/ Session(s) Offered	2012 Session 1
Course Code/ Name	PSYC3221 Vision and Brain
Academic Unit	School of Psychology
Level of Course	Stage 3 elective course
Units of Credit	6UOC
Hours per Week	4
Number of Weeks	12 weeks (1-10, 12-13; please note there will be no lectures in Week 11)
Commencement Date	Lectures start in Week 1 (first lecture on 27/2/2012) Laboratory classes start in Week 2
Prerequisites	PSYC2071 and PSYC2001
Assumed knowledge:	This course builds upon the second stage core course PSYC2071 Perception and Cognition. Students are encouraged to review their notes from this course.

Component	Time	Day	Location
Lecture 1	5 -6 pm	Monday	CLB 5
Lecture 2	10 - 11 am	Friday	BIOMED F
Lab 1	1-3 pm	Wednesday	Mathews 203
Lab 2	3-5 pm	Wednesday	Mathews 203
Lab 3	1-3 pm	Friday	Mathews 203

2. Staff Involved in the Course

Course Coordinator:

Name	Contact Details	Consultation Times
Dr Branka Spehar	Mathews 715 9385-1463 b.spehar@unsw.edu.au	<i>Email or phone for questions or appointments, or consult immediately following lectures.</i>

Lecturers:

Name	Contact Details	Consultation Times
Dr Branka Spehar	Mathews 715 9385-1463 b.spehar@unsw.edu.au	<i>Email or phone for questions or appointments, or consult immediately following lectures.</i>
Dr Mark Schira	NeuRA, Hospital Road, Randwick 9399-1131 m.schira@neura.edu.au	<i>Email or phone for questions or appointments, or consult immediately following lectures.</i>
Dr David White	Mathews 436 9385-3254 david.white@unsw.edu.au	<i>Email or phone for questions or appointments, or consult immediately following lectures.</i>
Dr Joel Pearson	Mathews 706 9385-3969 jpearson@unsw.edu.au	<i>Email or phone for questions or appointments, or consult immediately following lectures.</i>

Tutor:

Name	Contact Details	Consultation Times
Luke Vu	Mathews 703 9385-3913 luke.vu@unsw.edu.au	<i>Email or phone for questions or appointments, or consult immediately following laboratory classes.</i>

3. Course Description, Aims, Learning Outcomes and Teaching Strategies

Course Description:

Seeing is an amazing achievement, taking up 40% of the visual cortex. However, the relationship between the visual information carried by the photons bombarding our retinas and the visual experience that results is not a simple one. The problem of visual processing will be considered from ecological, physiological, philosophical, and computational perspectives. The general orientation of the course is a theoretical one but the applied aspects such as the role of basic perceptual processes in disorder such as autism and schizophrenia, and the implications for design of effective visual displays will be discussed as well.

Course Aims:

The main objectives of this course are to:

- Provide an advanced-level coverage of theoretical issues and research in visual perception through lectures and tutorials with an emphasis on the interdisciplinary nature of the scientific study of perceptual processes;
- Encourage you to critically evaluate theoretical claims and empirical evidence about perceptual processes;
- Develop skills in the design and conduct of empirical research in this area;
- Develop skills in the oral and written presentation of scientific information

Student Learning Outcomes:

By the end of this course, students will be able to

- Demonstrate knowledge of major contemporary theoretical views and empirical efforts in the area of perception and visual neuroscience
- Demonstrate understanding of and the ability to apply basic research methods for measuring various aspects of processing of visual stimuli (for example, perceptual biases and illusions, visual search efficiency, shape discrimination and identification);
- Apply knowledge of the visual processing in thinking about problems related to the creation of efficient visual designs and optimal human factors interfaces.
- Design and conduct basic studies in the area of perceptual processing: frame research questions; undertake literature searches; critically analyse theoretical and empirical studies; formulate testable hypotheses; operationalise variables; choose an appropriate methodology; make valid and reliable measurements; analyse data and interpret results;
- Write a standard research report using American Psychological Association (APA) structure and formatting conventions and write effectively in a variety of other formats (e.g., research proposals, summary presentations)
- Demonstrate effective oral communication skills
- Collaborate effectively in small groups (an ability to work with groups to complete projects within reasonable timeframes; manage conflicts appropriately and ethically).

Teaching strategies and rationale for learning and teaching in this course:

The two, one-hour lectures each week will be used to provide students with an advanced coverage of a selected number of topics within the fields of perception and visual neuroscience as well as implications for a number of diverse areas ranging from design to advertising and human factors interaction. The laboratory classes are designed to allow opportunities for in-depth and active learning of research methods in perception and development of oral and written presentation skills. All lectures and tutorials encourage an interactive style with questions being asked, and expected, in order to promote reflective and active learning. The teaching employs a variety of different methods and encourages students to take responsibility for their own learning and to work cooperatively.

The design of the structure, content and assessment of this course has been informed by the policy document “Guidelines on learning that inform teaching at UNSW” (see www.guidelinesonlearning.unsw.edu.au).

4. Course Schedule

Week	Date	Topic/Readings	Tutorial
1	M 27 Feb F 2 Mar	Introduction (BS) Vision and the coding of natural images I (BS)	<i>No tutorials</i>
2	M 5 Mar F 9 Mar	Scale specific visual processing (BS)	Tutorial 1 <i>Psychophysics</i>
3	M 12 Mar F 16 Mar	Local and global perception, Crowding (BS)	Tutorial 2 <i>Scale specific visual processing</i>
4	M 19 Mar F 23 Mar	From Retina to LGN to Cortex (MS)	Tutorial 3 <i>Research Article Review Presentations</i>
5	M 26 Mar F 30 Mar	Visual cortex: architecture and function (MS)	Tutorial 4 <i>Research Article Review Presentations (Contd.)</i>
6	M 2 Apr F 6 Apr	Mid-session exam (Weeks 1-4)	<i>No tutorials</i>
		Good Friday – University Holiday	
UNSW Mid-Session Break			
7	M 16 Apr F 20 Apr	Adaptation, attention and visual coding (BS)	Tutorial 5 <i>Group Research Projects – Introduction</i>
8	M 23 Apr F 27 Apr	Face perception: General characteristics and its relation to object processing (DW)	<i>No tutorials</i>
9	M 30 April F 4 May	Event perception and social perception from visual cues (BS)	Tutorial 6 <i>Research Project Proposal Presentations</i>
10	M 7 May F 11 May	Vision in Autism and Schizophrenia (BS)	Tutorial 7 <i>Research Project Consultations</i>
11	M 14 May F 18 May	<i>No lectures this week</i>	<i>No tutorials this week</i>
12	M 21 May F 25 May	Binocular rivalry (JP) Imagery (JP)	Tutorial 8 <i>Research Project Consultations</i>
13	M 28 May F 1 Jun	Visual perceptual learning Decision making and Consciousness (JP)	Tutorial 9 <i>Research Project Presentations</i>

5. Course Readings (Detailed Information)

Week	Readings
1	<p><u><i>Vision and the coding of natural images</i></u> Olshausen & Field (2003) Vision and the coding of natural images, <i>American Scientist</i>, 88, 238-245.</p> <p>Attewell & Baddeley (2007) The distribution of reflectances within the visual environment, 47, 548-554.</p>
2	<p><u><i>Scale specific Visual Processing</i></u> Schyns, P.G. & Oliva, A. (1994) From blobs to boundary edges: Evidence for Time- and Spatial-Scale-Dependent Scene Recognition <i>Psychological Science</i>, 5, 195-200</p> <p>Snowden, P. & Schyns, P. (2006) Channel surfing in the visual brain. <i>Trends in Cognitive Sciences</i>, 10, 12, 538-545.</p> <p>Bar, M. (2004) Visual Objects in Context. <i>Nature Reviews Neuroscience</i>, 5, 617-629.</p>
3	<p><u><i>Local and Global Processing, Crowding and Ensemble Coding</i></u> Sripati, A.P. & Olson, C.R. (2009) Representing the Forest before the Trees: A Global Advantage Effect in Monkey Inferotemporal Cortex. <i>Journal of Neuroscience</i>, 29:7788-7796.</p> <p>Yovel, I. Reville, W. & Mineka, S. (2005) Who sees trees before forest? The Obsessive-Compulsive style of Visual Attention. <i>Psychological Science</i>, 16, 123-129.</p> <p>Whitney, D., & Levi, D.M. (2011) Visual crowding: a fundamental limit on conscious perception and object recognition. <i>Trends in Cognitive Sciences</i>, 15, 160-168.</p> <p>Ariely (2001) Seeing sets: Representation by statistical properties. <i>Psychological Science</i>, 12,2, 157-162.</p>
4	<p><u><i>Introduction</i></u> Nassi & Callaway (2009) Parallel processing strategies of the primate visual system. <i>Nature Reviews: Neuroscience</i>, 10, 360-372.</p> <p>Wandell, B.A., Winawer J. (2011) Imaging retinotopic maps in the human brain. <i>Review, Vision Research</i> 5(7),718-737</p>
5	<p><u><i>Functional specialisation of visual areas</i></u> Kanwisher, N (2010) Functional specificity in the human brain: A window into the functional architecture of the mind. <i>Proceedings of the National Academy of Sciences</i>, 107,11163–11170.</p> <p>Goodale (2008) Action without perception in human vision. <i>Cognitive Neuropsychology</i>, 25: 7, 891-919</p>
6	<p><u><i>Mid- session Exam (Weeks 1-4)</i></u></p>
7	<p><u><i>Adaptation and visual coding</i></u> Kohn (2007) Visual Adaptation: Physiology, mechanisms and functional benefits. <i>Journal of Neurophysiology</i>, 97: 3155-3164.</p> <p>Webster, Kaping, Mizokami & Duhanel (2004) Adaptation to natural face categories. <i>Nature</i>, 428, 557-561.</p> <p><u><i>Attention and visual coding</i></u> Reynolds & Chelazzi (2004) Attentional modulation of visual processing. <i>Annual Review of Neuroscience</i>, 27, 611-647.</p>

Week	Readings
8	<p><u>Face and Object Processing</u> Johnston, R., & Edmonds, A. (2009). Familiar and unfamiliar face recognition: A review. <i>Memory</i>, 17(5), 577–596.</p> <p>Jenkins, R., & Burton, A. M. (2011). Stable face representations. <i>Philosophical Transactions of the Royal Society B: Biological Sciences</i>, 366(1571), 1671–1683.</p> <p>McKone, E., Kanwisher, N.M., & Duchaine, B. (2006). Trends in Cognitive Sciences, 11, 1, 8-15.</p> <p>Palmeri, T.J., & Gauthier, I. (2004) Visual Object Understanding. <i>Nature Reviews Neuroscience</i>, 5, 291-304.</p>
9	<p><u>Event Perception and Social Perception from visual cues</u> Scholl, B.J. & Tremoulet, P.D. (2000) Perceptual causality and animacy. <i>Trends in Cognitive Sciences</i>, 4, 299-309.</p> <p>Truett A. Puce, A. & McCarthy, G. (2000) Social perception from visual cues: role of the STS region. <i>Trends in Cognitive Sciences</i>, 4, 267-278.</p>
10	<p><u>Vision in Autism and Schizophrenia</u> Berhmann, Thomas & Humphreys (2006) Seeing it differently: visual processing in autism. <i>Trends in Cognitive Sciences</i>, 10, 6, 258-264.</p> <p>Simmons, robertson, McKay, Toal, McALeer & Pollick (2009) Vision in autism spectrum disorders. <i>Vision Research</i>, 49, 2705-2739.</p> <p>Dakin, Carlin & Hemsley (2005) Weak suppression of visual context in chronic shizophrenia. <i>Current Biology</i>, 15, 20, 822-824.</p>
11	<p><u>No lectures this week</u></p>
12	<p><u>Binocular rivalry</u> Blake, R., & Logothetis, N. K. (2002). Visual competition. <i>Nature Reviews Neuroscience</i>, 3(1), 13–21. doi:10.1038/nrn701</p> <p>Tong, F., Meng, M., & Blake, R. (2006). Neural bases of binocular rivalry. <i>Trends in Cognitive Sciences</i>, 10(11), 502–511. doi:10.1016/j.tics.2006.09.003</p> <p><u>Imagery</u> Kosslyn, S. M., Ganis, G., & Thompson, W. L. (2001). Neural foundations of imagery. <i>Nat Rev Neurosci</i>, 2(9), 635-642.</p> <p>Pylyshyn, Z. (2003). Return of the mental image: Are there really pictures in the brain? <i>Trends Cogn Sci</i>, 7(3), 113-118.</p>
13	<p><u>Visual perceptual learning</u> Sasaki, Y., Nanez, J. E., & Watanabe, T. (2010). Advances in visual perceptual learning and plasticity. <i>Nature Reviews Neuroscience</i>, 11(1), 53–60. doi:10.1038/nrn2737</p> <p>Sagi, D. (2011). Perceptual learning in Vision Research. <i>Vision Research</i>, 51(13), 1552–1566. Elsevier Ltd. doi:10.1016/j.visres.2010.10.019</p> <p><u>Decision making and Consciousness (JP)</u> Haynes, J.-D., Sakai, K., Rees, G., Gilbert, S., Frith, C., & Passingham, R. E. (2007). Reading hidden intentions in the human brain. <i>Current Biology</i>, 17(4), 323-328.</p> <p>Shiv, B. & Fedorikhin, A. (1999). Heart and Mind in Conflict: The Interplay of Affect and Cognition in Consumer Decision Making. <i>The Journal of consumer research</i>, 26. 3. 278-292.</p>
13	<p><u>Visual perceptual learning</u> Sasaki, Y., Nanez, J. E., & Watanabe, T. (2010). Advances in visual perceptual learning and plasticity. <i>Nature Reviews Neuroscience</i>, 11(1), 53–60. doi:10.1038/nrn2737</p>

6. Assessment Schedule and Details

Unit	Weight	Due date
Mid-session exam	15% (or 25%)	Monday, 2 April 2012
Assignment 1 (<i>Research Article Assignment</i>)	15 %	Weeks 4 & 5 tutorials
Group research project and report:	30%	Weeks 9 (5%) and 13 (10%, 15%)
Final exam	40% (or 30%)	UNSW exam period

Mid-Session Exam:

The mid-session exam (Monday 2 April) will consist of multiple-choice and short essay questions (Weeks 1-4 material). The performance on this exam will count towards 15% of your final grade. However, if you perform better on the midterm exam than on your final exam, midterm exam will count 25% and the final exam will count only 30% toward your final grade. The performance comparison on these two exams will be based on the standardized z-scores (not the raw scores).

Final Exam:

The final examination will be in the University Examination period and will be worth 40% of the final grade (but see above Mid-Session Exam section). The final exam will contain approximately 8 short essay questions. These questions will be drawn from the lectures, tutorials, and the readings.

Students can attend the final examination only once, either in the regularly scheduled or deferred examination period. As you will not be permitted to attend both the regularly scheduled and deferred examinations, you are advised not to attend the exam as originally scheduled if sick on that day. Instead, ensure that you have the appropriate medical certificate to support your case for deferred medical exam. In such a case, a formal application for special consideration must be submitted to Student Central within three working days of the assessment to which it refers. Deferred examination opportunity for each course will be offered only once.

Deferred and alternative assessment materials may be in a different format from the original (i.e. short answers instead of MC questions, oral examination instead of written examination etc). In addition, the original and deferred assessment materials may also differ in the specific content, although overall both will be sampled for the same relevant course material.

Research Article Review (Weighting: 10% (oral presentation and accompanying PowerPoint slides):

In this assignment you will be required to select one research article and create 5 PowerPoint slides that will 1) present the topic/phenomenon it is on and its significance for understanding vision; (2) summarize at least two competing explanations of that phenomenon (in the case where you cannot find numerous competing explanations, summarize the original explanation and at least one subsequent refinement) (3) summarize the methodology and findings of the chosen research article: (4) provide one research question that can extend and further refine the findings in this area

Oral presentations (7 minutes in duration) will be scheduled in Week 4 & 5 tutorials.

The PowerPoint slides of your presentation will be assessed in addition to oral presentation. These will be submitted electronically (via an Assignment upload into the Blackboard course site and will be due on the day of your presentation (either right before or right after your tutorial presentation).

Group research project and report: (35% total)

As part of this course you will be required to design and conduct a small-scale empirical research project in the area of visual perception. First you will be asked to present a brief proposal of your project in Week 9 (5%). After the completion of your project, you will be asked to make a poster summary of your research projects with a short oral presentation (15-20 minutes) on your project (10%). All members of the research group are required to take part in these presentations, as you will be awarded a single mark as a group. However, written research reports on this project are expected to be individually written and submitted and will receive individual mark worth 15%. The report should be formatted as a research report for the journal Psychological Science and should be approximately 2000 words in length.

Your tutor will be available to advise you during all stages of your project.

Components:

Presentation of research proposal (5%)

- one Powerpoint research proposal per group; one group mark for all members; due in Week 9 tutorials;

Research project poster presentation (10%)

- all group members contributes; one group mark for all members; due in Week 13 tutorials;

Individual research report (15%)

-the final reports should be individually written and will be individually marked; (approx 2000-2250 words, Psychological Science journal style); due Monday 4th June.

7. Summary of Graduate Attributes Developed and Assessed in this Course

(Source: *Graduate Attributes of the Australian Undergraduate Psychology Program, as part of the APAC Standards*, <http://www.apac.psychology.org.au/Content.aspx?ID=1083>)

Psychology Graduate Attributes	LEVEL OF ATTAINMENT <i>1 = Introductory</i> <i>2 = Intermediate</i> <i>3 = Advanced</i>	Activities / Assessment
1. Knowledge and Understanding of Psychology	3	Activities: Lectures, Laboratory classes Assessment: Final examination, written assignments
2. Research Methods in Psychology	3	Activities: Lectures, Group research project Assessment: Final examination, Group presentation, Individual written report
3. Critical Thinking Skills in Psychology	3	Activities: Lectures, Laboratory classes Assessment: Final examination, written assignments
4. Values in Psychology	1	Activities: Group research project (research ethics)
5. Communication Skills	3	Activities: Laboratory classes; Group research project Assessment: Written assignments and oral presentation
6. Learning and the Application of Psychology	2	Activities: Lectures, Laboratory classes

8. Additional Resources and Support

Textbook and readings:

There is no textbook set for this course. The course is organized around review articles taken from journals such as Trends in Neuroscience, Trends in Cognitive Science, Annual Review of Neuroscience, Vision Research, Current Biology, Nature, Nature Neuroscience or similar. These articles can be downloaded via the UNSW Library holdings or from the course Blackboard website.

Course Website and Recordings

Lecture notes will be made available on the course website located at the UNSW Blackboard server (telt.unsw.edu.au), but this should not be seen as being a substitute for the lecture itself because important details may be given in the lecture that are not found in these notes. Please note that due to copyright restrictions it is not always possible to post copies of all of the materials covered in lectures.

Recorded version of the lectures will be posted there as well. Please note that due to unforeseen errors in the central Lectopia system, some lectures never get recorded or are recorded badly. Consequently, do not rely on these as your main source of information regarding lecture material.

If you have any trouble logging on to Blackboard you should first consult the on-line support service provided by the University at: <http://support.telt.unsw.edu.au/blackboard/content/default.cfm?ss=0>

Other course-relevant information: Throughout the session, the course-relevant information and announcement will be posted at the Blackboard PSYC3221 Vision and Brain site. Students should regularly log into this site for any updated information on the course.

9. Administrative Matters

Attendance at lectures and laboratory classes

Attendance at both lectures and tutorials is an essential part of the course and both lecture and tutorial material/activities will be assessed. Tutors will keep a record of student attendance at tutorials and students who are absent from three or more practicals without a satisfactory explanation may be failed in the subject.

Assessment submissions:

The hard copies of your assignments must be submitted to the drop box located at the School Office on Level 10 (Mathews Room 1011) by 4.30pm on the day it is due or earlier. These will be date stamped by the School Office and taken as a formal evidence of submission. In addition, an electronic version must also be lodged into the Blackboard course module as insurance in the case of misplaced hard copies of submitted assignments. If you fail to do this, there will be no proof that the assignment was handed in on time and onus is on students to prove submission.

Keep your tutor or a course coordinator informed of any problems that you are having in completing assignments and of any extenuating circumstances that might warrant an extension.

In addition to this Course Guide it is a course requirement that ALL STUDENTS DOWNLOAD AND BECOME FAMILIAR WITH THE 2011 PSYCHOLOGY UNDERGRADUATE STUDENT GUIDE. Copies can be downloaded from:

http://www.psy.unsw.edu.au/students/current/files/Student_Guide.pdf

You are responsible for familiarizing yourself with this information. This means you cannot say “I didn’t know” if you violate any regulations set out in this document.

Student Complaint Procedures:

If there are any objections regarding the content or conduct in this course students are encouraged to contact the course coordinator or other teaching staff. Other points of contact are:

School Contact	Faculty Contact	University Contact
A/Prof Jacquelyn Cranney, Room 509 9385 3527 j.cranney@unsw.edu.au),	A/Prof Julian Cox Associate Dean (Education) julian.cox@unsw.edu.au Tel: 9385 8574 or Dr Scott Mooney Associate Dean (Undergraduate Programs) s.mooney@unsw.edu.au Tel: 9385 8063	Student Conduct and Appeals Officer (SCAO) within the Office of the Pro-Vice-Chancellor (Students) and Registrar. Telephone 02 9385 8515, email studentcomplaints@unsw.edu.au University Counselling and Psychological Services ¹ Tel: 9385 5418

10. Course Evaluation and Development

Periodically student evaluative feedback on this course is gathered, using UNSW's Course and Teaching Evaluation and Improvement (CATEI) Process. Student feedback is taken seriously, and continual improvements are made to the course based in part on such feedback. Significant changes to the course will be communicated to subsequent cohorts of students taking the course

¹ [University Counselling and Psychological Services](#)

11. UNSW Academic Honesty and Plagiarism

What is 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 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.†

For the purposes of this policy, submitting an assessment item that has already been submitted for academic credit elsewhere may be considered plagiarism.

Knowingly permitting your work to be copied by another student may also be considered to be plagiarism.

Note that an assessment item produced in oral, not written, form, or involving live presentation, may similarly contain plagiarised material.

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

The Learning Centre website is main repository for resources for staff and students on plagiarism and academic honesty. These resources can be located via:

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.

* 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