

PSYC2011 – Brain & Behaviour

Unit of Study Code:	PSYC2011
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Format of Unit:	3 x 1 hour lectures/week x 13 weeks 1 x 1 hour tutorial/week x 12 weeks
Credit Point Value:	6 Credit Points
Prerequisites:	12 credit points of First Year Psychology including PSYC 1001 and PSYC 1002
Assessment:	Classwork: 35% of total mark: 1,500 word Laboratory Report Should involve 6 x 2 h of background library research Due Date: week 10, Friday 15th May, 2009 15% of total mark: 25 item multiple-choice quiz in week 13 In your normal tutorial class Examination: 50% of total mark: 2/3 Multiple-choice questions; 1/3 Short answer questions
Evaluation of teaching:	Date: Week 13 Type: General Student Feedback Questionnaire

Unit of study general description:

This unit of study examines a range of phenomena and principles in learning and perception and their underlying neural substrates. The emphasis in learning is on instrumental conditioning and the principle of reinforcement, ranging from applications of this principle to its neural substrates. Also covered are analyses of aversive-based learning, such as punishment and avoidance, and anxiety, together with related neurochemical mechanisms and the effects of various psychopharmacological agents on these processes. A number of perceptual phenomena will be studied (e.g., vision and hearing, perception of pitch, recognition of odours). A series of practical classes and demonstrations allow students to gain hands-on experience of how some of these principles and phenomena may be studied experimentally.

Graduate Attributes and Student Learning Outcomes for Brain and Behaviour (Psyc2011)

This course is structured around the graduate attributes associated with the scientist-practitioner model, the basis for the training of psychologists in Australia and internationally.

Graduate Attributes are the generic skills, abilities and qualities that students should acquire during their university experience and the School of Psychology is committed to providing an environment to promote these skills. In addition, this unit of study will provide students with generalised and transferable skills that will also be useful in careers outside psychology.

The following graduate attributes and student learning outcomes will be developed through lectures, tutorial and assessment activities in particular. They will be assessed primarily in the laboratory report and essay, and in the tutorial quiz and final examination.

1: Knowledge and Understanding of the Brain and Behaviour

Display basic knowledge and understanding the major concepts, theoretical perspectives, empirical findings, and historical trends in the study of brain and behaviour

Student learning outcomes:

- (i) An interest in and appreciation of the historical and current contribution of learning theorists, neuroscientists, psychopharmacologists and sensory scientists to the understanding of the brain and behaviour and to the treatment of mental illness and neurological disorders.
- (ii) Understanding basic properties of conditioning, especially instrumental learning.
- (iii) Understanding the neurochemical bases of reinforcement, addiction, anxiety and depression.
- (iv) Understanding basic processes of human visual and auditory perception and the vestibular system
- (v) Understanding comparative studies of complex learning, problem solving and memory.
- (vi) Awareness of the relationship between theoretical research and practical applications of behavioural and physiological findings.
- (vii) Ability to describe, explain and evaluate research studies in these fields.
- (viii) Awareness, and some hands-on experience, of animal-based behavioural research.
- (ix) Skill in reporting experimental work using standard conventions.

2: Research Methods in the study of Brain and Behaviour

Understand, apply and evaluate basic research methods in learning theory and psychopharmacology including research design, data analysis and interpretation, and the appropriate use of technologies.

Student learning outcomes:

- (i) To develop a critical understanding of the major methods of research in these areas.
- (ii) To critically assess the major theories and research findings in these areas.
- (iii) To interpret statistical analyses.
- (iv) Use basic web-search, word-processing, database, email, spreadsheet, and data analysis programs.
- (v) Design and conduct basic studies to address psychological questions: 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; and write research reports.

3: Critical Thinking Skills in the study of Brain and Behaviour

Respect and use critical and creative thinking, sceptical inquiry, and the scientific approach to solve problems related to the brain and behaviour.

Student learning outcomes:

- (i) Demonstrate an attitude of critical thinking that includes persistence, open-mindedness, and intellectual engagement.
- (ii) Evaluate the quality of information, including differentiating empirical evidence from speculation.
- (iii) Evaluate issues and behaviour using different theoretical and methodological approaches.
- (iv) Use reasoning and evidence to recognise, develop, defend, and criticise arguments and persuasive appeals.

4: Values in the study of Brain and Behaviour

Value empirical evidence; act ethically and professionally; and understand the complexity of sociocultural and international diversity.

Student learning outcomes:

- (i) Use information in an ethical manner (e.g., acknowledge and respect the work and intellectual property rights of others through appropriate citations in oral and written communication)
- (ii) Be able to recognise and promote ethical practice in research.
- (iii) Promote evidence-based approaches and rigour in the understanding of behaviour.
- (iv) Be aware of ethical issues pertaining to the use of laboratory animals in research.

5: Communication Skills in the study of Brain and Behaviour

Communicate effectively in a variety of formats and in a variety of contexts

Student learning outcomes:

- (i) Write a standard research report using American Psychological Association (APA) structure and formatting conventions.
- (ii) Write effectively in a variety of other formats (e.g., essays, research proposals, reports) and for a variety of purposes (e.g., informing, arguing).
- (iii) Demonstrate effective oral communication skills in various formats (e.g., debate, group discussion, presentation) and for various purposes.
- (iv) Collaborate effectively, demonstrating an ability to: work with groups to complete projects within reasonable timeframes; manage conflicts appropriately and ethically.

6: Learning and the Application of the studies of Brain and Behaviour

Understand and apply psychological principles to personal and social issues.

Student learning outcomes:

- (i) To develop an awareness of the applications of the theories and research findings in Neuroscience, Psychopharmacology, Perception and Learning.
- (ii) Apply psychological concepts, theories, and research findings to solve problems in everyday life and in society.
- (iii) Understand major areas of applied psychology and neuroscience.
- (iv) Understand how basic research in psychopharmacology and neuroscience gives rise to treatments for addictions, depression, anxiety disorders and neurological disorders.

Evidence of learning:

Achieving a Pass standard in the examination demonstrates success in achieving outcomes 1 – 6.

Successful achievement of Outcomes 1, 7 and 8 is shown by completion of the laboratory report at a Pass standard and of Outcome 2 and 5 by a Pass mark in the Tutorial Quiz.

SYLLABUS

Fundamental principles of instrumental conditioning based on animal research and their human applications, involving both positive and aversive events, and their neural and pharmacological bases; fear, anxiety and stress; applications of research on learning; comparative studies of cognitive processes; psychopharmacology of addiction and of anxiety; genetic basis of behaviour; human auditory, visual and tactile perception and underlying brain mechanisms.

LECTURE AND TUTORIAL TIMETABLE

date	week	lecture#	Lecture topic	tutorial
2-Mar	1	1 2 3	Introduction to the study of behaviour Positive reinforcement and extinction (Costa) The role of the discriminative stimulus in	no tutorial
8-Mar	2	4 5 6	The motivating role of the reinforcer in Fear and punishment (Costa) Avoidance learning (Costa)	Introduction to the animal laboratory: DVD "The Laboratory Rat"
16-Mar	3	7 8 9	Learned helplessness (Johnston) Choice and self-control (Johnston) Intrinsic motivation (Johnston)	1st practical: Habituation and magazine training
23-Mar	4	10 11 12	Biological constraints on learning (Johnston) Measuring intelligence in non-verbal animals Applied behavioural analysis focusing on	2nd practical: Establishing an instrumental response
30-Mar	5	13 14 15	Behavioural analysis of drug taking (Johnston) Neuroscience of reinforcement: Brain Neuroscience of reinforcement: Dopamine	3rd practical: Partial reinforcement
6-Apr	6	16 17 18	Neuroscience of goal-directed behaviour Addiction: the role of dopamine and oxytocin Addiction: treatments (Johnston)	4th practical: Choice between schedules of reinforcement
			EASTER BREAK	
20-Apr	7	19 20 21	Fear and anxiety: Neuroendocrinology Fear and anxiety: the benzodiazepines Fear and anxiety: the amygdala and prefrontal	5th practical: Extinction and conditioned reinforcement
27-Apr	8	22 23 24	Depression and antidepressants (Johnston) Sociobiology: The selfish gene, survival and Behavioural genetics (Johnston)	6th practical: Reinforcer satiety and instrumental behaviour.
4-May	9	25 26 27	The brain and health (Johnston) Glial cells (Johnston) Pain (Johnston)	7th practical: The human brain
11-May	10	28 29 30	Sound and hearing (Curthoys) Pitch and hearing loss (Curthoys) Binaural hearing (Curthoys)	8th practical: The microscopic brain (Learning Lab Reports due)
18-May	11	31 32 33	Vestibular System 1. Balance and space flight Vestibular System 2: Inner ear controls visual Vestibular System 3. The neural basis of	9th practical: Audition
25-May	12	34 35 36	Perceptual organization 1 (Anderson) Perceptual organization 2 (Anderson) Perceptual organization 3 (Anderson)	10th practical: The visual brain
1-Jun	13	37 38 39	Olfactory perception (Russell) Human brain development (Holcombe) Perceptual development (Holcombe)	Tutorial quiz and course evaluation held in your tutorial class

TEXTS

There is no required textbook for this course. However, it is highly recommended that students obtain copies of two books. References to these will be given in lectures and both books are recommended for 3rd year (Senior Psychology) courses that following on from PSYC2011.

Bouton, M.E. (2007). *Learning and Behavior: A Contemporary Synthesis* (This text will be particularly useful in Weeks 1- 5 and is also used in the Senior Psychology course PSYC3011 *Learning and Behaviour*)

Carlson, N.R. (2007). *Physiology of Behavior*. 9th edition. Needham Heights, Mass: Allyn & Bacon.

(This text will be particularly useful in Weeks 6-13 and is also used in the Senior Psychology course PSYC 3014 *Behavioural and Cognitive Neuroscience*).

FURTHER READING

Where possible references for lecture and tutorial material will be from the two texts above. In addition, some reference will be made to the following source in the later perception lectures:

Blake, R and Sekuler, R (2005) *Perception*. 5th Edition. McGraw-Hill. (this textbook is also used in the Senior Psychology course PSYC3013 *Perceptual Systems*).

Plagiarism is not permitted

i) Do you know what plagiarism is?

Please refer to the University policy on plagiarism:

<http://www.usyd.edu.au/senate/policies/Plagiarism.pdf>

ii) The School of Psychology will severely penalise **all** submitted work that is plagiarised;

iii) The School of Psychology is using software to detect **all** forms of plagiarism.

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<http://www.library.usyd.edu.au/>

The University of Sydney Library is a distributed system of 14 libraries with a collection of over 5 million items. Fisher Library is located on Eastern Avenue, Camperdown Campus. Fisher Library has the most resources relevant to Psychology.

Poppy Prezios is your Psychology Faculty Liaison Librarian. You can find her at Badham Library Ground Floor, Badham Building Science Rd, Camperdown Campus. You can phone her on 0434 606 913 or email at p.prezios@library.usyd.edu.au.

Psychology books in high demand

Reserve (located on Level 2 of Fisher Library) is a 2 hour loan collection. Most of the required and recommended items will be here. Details of items required can be located in the catalogue.

<http://opac.library.usyd.edu.au/search/r>

Psychology Guide

includes links to Psychology databases, internet resources, information on tests and more.

<http://libguides.library.usyd.edu.au/psychology>

Finding items on your reading lists

Your reading lists will contain different styles of citations, depending on the type of publication. The link below will take you to help on finding items on your reading list.

<http://elearning.library.usyd.edu.au/learn/readinglist/index.php>