**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:**

20% of total mark: 1,500 word Laboratory Report  
Should involve 6 x 2 h of background library research  
Due Date: week 10, Friday 16th May

20% of total mark: 1,000 word Essay  
Should involve 6 x 2 h of background library research  
Due Date: week 12, Friday 30th May

10% of total mark: 25 item multiple-choice quiz in week 13  
In your normal tutorial class

**Examination:**

50% of total mark: Multiple-choice 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 faces). 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 memory and other cognitive processes; psychopharmacology of addiction and of anxiety; olfactory systems; human auditory, visual and tactile perception and underlying brain mechanisms.

**LECTURE AND TUTORIAL TIMETABLE**

<table>
<thead>
<tr>
<th>date</th>
<th>week</th>
<th>lecture#</th>
<th>Lecture topic</th>
<th>tutorial</th>
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<tbody>
<tr>
<td>3-Mar</td>
<td>1</td>
<td>1</td>
<td>Introduction to associative learning (Harris)</td>
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<td>2</td>
<td>Positive reinforcement and extinction (Harris)</td>
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<td>3</td>
<td>Associative learning about food (Harris)</td>
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<td>10-Mar</td>
<td>2</td>
<td>4</td>
<td>Associative learning and responses to drugs (Harris)</td>
<td>Introduction to the animal laboratory: DVD &quot;The Laboratory Rat&quot;</td>
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<td>5</td>
<td>Associative learning and drug-taking behaviour (Harris)</td>
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<td>6</td>
<td>Contiguity, contingency and associations (Baysari)</td>
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<tr>
<td>17-Mar</td>
<td>3</td>
<td>7</td>
<td>Discrimination learning (Baysari)</td>
<td>1st practical: Habituation and magazine training</td>
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<td>8</td>
<td>Fear and punishment (Baysari)</td>
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<td>9</td>
<td>Avoidance learning (Baysari)</td>
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<td>EASTER BREAK</td>
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<td>31-Mar</td>
<td>4</td>
<td>10</td>
<td>Learned helplessness (Baysari)</td>
<td>2nd practical: Establishing an instrumental response</td>
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<td>Spatial learning (Livesey)</td>
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<td>Learning &amp; awareness (Livesey)</td>
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<td>7-Apr</td>
<td>5</td>
<td>13</td>
<td>Distinctions between learning systems (Livesey)</td>
<td>3rd practical: Partial reinforcement</td>
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<td>Contingency learning and causal judgment (Livesey)</td>
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<td>Discrimination and genealisation (Livesey)</td>
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<td>14-Apr</td>
<td>6</td>
<td>16</td>
<td>Reinforcing brain stimulation (McGregor)</td>
<td>4th practical: Schedules of reinforcement</td>
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<td>17</td>
<td>Human brain stimulation techniques (McGregor)</td>
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<td>Drugs and the brain: basic neuropharmacology (McGregor)</td>
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<td>21-Apr</td>
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<td>Drugs and the brain: cannabinoids (McGregor)</td>
<td>5th practical: Extinction and conditioned reinforcement</td>
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<td>Addiction: the role of dopamine (McGregor)</td>
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<td>Addiction: treatments (McGregor)</td>
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<td>28-Apr</td>
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<td>Fear and anxiety: animal models (McGregor)</td>
<td>8th practical: Comparing the effectiveness of two reinforcers</td>
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<td>23</td>
<td>Fear and anxiety: psychopharmacology (McGregor)</td>
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<td>Fear and anxiety: neural substrates (McGregor)</td>
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<td>5-May</td>
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<td>25</td>
<td>Depression and antidepressants (McGregor)</td>
<td>7th practical: The human brain</td>
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<td>26</td>
<td>Learning and memory: anatomy (McGregor)</td>
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<td>Learning and memory: electrophysiology (McGregor)</td>
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<td>12-May</td>
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<td>28</td>
<td>Learning and memory: pharmacology (McGregor)</td>
<td>8th practical: Audition</td>
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<td>29</td>
<td>Hearing speech (Curthoys)</td>
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<td>Binaural hearing (Curthoys)</td>
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<tr>
<td>19-May</td>
<td>11</td>
<td>31</td>
<td>Sound and hearing (Curthoys)</td>
<td>9th practical: The microscopic brain</td>
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<td>The perception of pitch (Curthoys)</td>
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<td>Vestibular 1 (Curthoys)</td>
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<td>26-May</td>
<td>12</td>
<td>34</td>
<td>Vestibular 2 (Curthoys)</td>
<td>10th practical: The visual brain</td>
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<td>35</td>
<td>Olfaction: the main olfactory system (McGregor)</td>
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<td>36</td>
<td>Olfactory learning and memory (McGregor)</td>
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<td>2-Jun</td>
<td>13</td>
<td>37</td>
<td>Olfaction: pheromones (McGregor)</td>
<td>Tutorial quiz and course evaluation</td>
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<td>38</td>
<td>Perceptual development (1) (Holcombe)</td>
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<td>39</td>
<td>Perceptual development (2) (Holcombe)</td>
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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:


Plagiarism is not permitted

i) Do you know what plagiarism is?

Please refer to the University policy on plagiarism:


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.