PSYC2011 – Brain & Behaviour

Unit of Study Code: PSYC2011

Co-ordinator: Dr Ian Johnston
Office: Room 454 Brennan MacCallum Building
Phone: 9351 4353
E-mail: i.johnston@sydney.edu.au

Other lecturers:
Dr Evan Livesey
Office: Room 502 Griffith Taylor Building
Phone: 9351 2845
Email: evan.livesey@sydney.edu.au

Dr Laura Corbit
Office: Room 514 Griffith Taylor Building
Phone: 9351 7074
Email: laurac@psych.usyd.edu.au

Professor Ian Curthoys
Office: Room 231 South Badham Building
Phone: 9351 3570
E-mail: ian.curthoys@sydney.edu.au

Professor Bart Anderson
Office: Room 526 Griffith Taylor Building
Phone: 9306 7259
E-mail: barton.anderson@sydney.edu.au

Mr Alex Russell
Office: Room 310 Griffith Taylor Building
Phone: 9036 7265
Email: alexr@psych.usyd.edu.au

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:
30% of total mark: 1,500 word Laboratory Report
Should involve 6 x 2 h of background library research
Due Date: Friday, 6th May (Week 9)

15% of total mark: 24 item multiple-choice quiz in week 13 in your normal tutorial class

5% of total mark: Participating in the debate in week 8 in your normal tutorial class and bringing a one-page hand-written summary of personal background research in the topic.

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, recognition of tastes and odours, touch and pain). 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 and applied to behavioural change.

Graduate Attributes and Student Learning Outcomes for Brain and Behaviour (Psyc211)

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 behavioural modification procedures.

(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, 5 and 6 is shown by completion of the laboratory report at a Pass standard and of Outcome 1, 2 and 6 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

<table>
<thead>
<tr>
<th>date</th>
<th>week</th>
<th>lecture#</th>
<th>Lecture topic</th>
<th>tutorial</th>
</tr>
</thead>
<tbody>
<tr>
<td>28-Feb</td>
<td>1</td>
<td>1</td>
<td>Introduction to Brain and Behaviour (Johnston)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2</td>
<td>Sociobiology: Natural selection of psychological traits (Johnston)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>Behavioural genetics (Johnston)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>Positive reinforcement and extinction (Livesey)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6</td>
<td>The role of the discriminative stimulus in behaviour (Livesey)</td>
<td></td>
</tr>
<tr>
<td>14-Mar</td>
<td>3</td>
<td>7</td>
<td>The motivating role of the reinforcer in behaviour (Livesey)</td>
<td>Behaviour analysis 2: Measuring baseline behaviour. Submit draft report introduction section.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>Fear and punishment (Livesey)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>9</td>
<td>Avoidance learning (Livesey)</td>
<td></td>
</tr>
<tr>
<td>21-Mar</td>
<td>4</td>
<td>10</td>
<td>Learned helplessness (Johnston)</td>
<td>Behaviour analysis 3: Analysis of baseline behaviour, Development of self-behaviour modification plan.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11</td>
<td>Control and Risk (Johnston)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>Choice and self-control (Johnston)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>14</td>
<td>Comparative cognition (Johnston)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>Behavioural therapies (Johnston + Guests)</td>
<td></td>
</tr>
<tr>
<td>4-Apr</td>
<td>6</td>
<td>16</td>
<td>Excitatory and inhibitory amino acids: Fundamental concepts in psychopharmacology (Corbit)</td>
<td>Behaviour analysis 5: Analysis of results of self-behaviour modification programme.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>17</td>
<td>Dopamine: Reinforcement and learning (Corbit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>18</td>
<td>Dopamine: Drugs and addiction (Corbit)</td>
<td></td>
</tr>
<tr>
<td>11-Apr</td>
<td>7</td>
<td>19</td>
<td>Neuroendocrinology: Stress and distress (Corbit)</td>
<td>Behaviour analysis 6: Submit draft report results section, Discuss report writing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20</td>
<td>Serotonin: Depression and anxiety (Corbit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>21</td>
<td>Other neurotransmitters and neuropeptides (Corbit)</td>
<td></td>
</tr>
<tr>
<td>18-Apr</td>
<td>8</td>
<td>22</td>
<td>Vision (Anderson)</td>
<td>Debate: “Are drug addicts responsible for their dependency?”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>23</td>
<td>Vision (Anderson)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>24</td>
<td>Vision (Anderson)</td>
<td></td>
</tr>
<tr>
<td>25-Apr</td>
<td></td>
<td></td>
<td>Easter break</td>
<td></td>
</tr>
<tr>
<td>2-May</td>
<td>9</td>
<td>25</td>
<td>Neurobiology of appetite (Johnston)</td>
<td>Neuroscience 1: Neurons and psychopharmacology Final version of your Behaviour Analysis reports due, Friday 6th May.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>26</td>
<td>Neurobiology of sexual and prosocial behaviour (Johnston)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>27</td>
<td>Neurobiology of health (Johnston)</td>
<td></td>
</tr>
<tr>
<td>9-May</td>
<td>10</td>
<td>28</td>
<td>Neural development (Johnston)</td>
<td>Neuroscience 2: Organization of the brain and cortex</td>
</tr>
<tr>
<td></td>
<td></td>
<td>29</td>
<td>Touch, pain and chronic pain (Johnston)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>30</td>
<td>Cortical reorganisation (Johnston)</td>
<td></td>
</tr>
<tr>
<td>16-May</td>
<td>11</td>
<td>31</td>
<td>Sound and hearing (Curthoys)</td>
<td>Perception 1: Vision and colour perception.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>32</td>
<td>Pitch and hearing loss (Curthoys)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>33</td>
<td>Binaural hearing (Curthoys)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>35</td>
<td>Vestibular System 2: Inner ear controls visual stability (Curthoys)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>36</td>
<td>Vestibular System 3. The neural basis of balance (Curthoys)</td>
<td></td>
</tr>
<tr>
<td>30-May</td>
<td>13</td>
<td>37</td>
<td>The chemical senses I (Russell)</td>
<td>Tutorial quiz held in your tutorial class. Course evaluation Behaviour analysis reports returned.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>38</td>
<td>The chemical senses II (Russell)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>39</td>
<td>No lecture</td>
<td></td>
</tr>
</tbody>
</table>
TEXTS

There are no required textbooks for this course. However, it is highly recommended that students obtain copies of the following 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.

(This text will be particularly useful in Weeks 1-5 and is also used in the Senior Psychology course PSYC3011 *Learning and Behaviour*).

(This text will be particularly useful in Weeks 6-13 and is also used in the Senior Psychology course PSYC3014 *Behavioural and Cognitive Neuroscience*).

Copies of these texts will be made available in the Library Reserve so you may copy the relevant sections as an alternative to buying the complete text.

FURTHER READING

Each lecturer will provide references to sources for you to study in their lecture notes or on their eLearning site. These sources will be made available to you from the Library’s reserve section. Please look at the following website for information on what material is held in reserve for you:

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

You will be provided with detailed tutorial notes in your tutorial classes.
Plagiarism is not permitted

i) Are you sure 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 (this will apply to your Group Project)
Research and resource support for Psychology students

The University of Sydney Library has 12 libraries in different locations, on different subjects with different facilities. Fisher Library is where you will find the physical collection of most relevance to your Psychology studies. Fisher Library is located on Eastern Ave, Camperdown campus. We also have loads available online – find us at sydney.edu.au/library/

You can contact your Psychology Faculty Liaison Librarian at library.psychology@sydney.edu.au. The Psychology Librarian is located at Badham Library, level 1, Badham Building, Science Rd, Camperdown Campus. You can phone 91141292 or send an email psychology.library@sydney.edu.au

Psychology books in high demand

Reserve (located on Level 2 of Fisher Library) is a 2 hour loan collection. Most of your required and recommended items will be here. Details of these can are located in the catalogue, you search for these at opac.library.usyd.edu.au/search/r

Psychology subject guide

There is a comprehensive subject guide that includes links to psychology databases, internet resources, information on tests and measurements and more. Take a look at libguides.library.usyd.edu.au/psychology

You can also enrol in database sessions and EndNote classes.

Need a refresher after the long vacation?

Watch and listen to these online learning objects and get back up to speed with information literacy skills on topics such as research, essay writing and referencing. http://www.library.usyd.edu.au/skills/