PSYC2111 – Learning, Neuroscience and Perception

Unit of Study Code: PSYC2111

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Format of Unit: 2 x 1 hour lectures/week x 13 weeks
1 x 1 hour tutorial/week x 12 weeks
Tutorial sizes: maximum of 20 students per group

Credit Point Value: 4 Credit Points

Prerequisites 12 credit points of First Year Psychology including PSYC 1001 and PSYC 1002

Assessment: Classwork:
25% of total mark: 1,000 words Laboratory Report
Due Date: Friday 23 May (Week 10)

25% of total mark: Tutorial Quiz
10 June – 13 June (Week 13)

Examination:
50% of total mark: Multiple-choice questions

Evaluation of teaching:
Date: Week 13
Type: General Student Feedback Questionnaire

Unit of study general description:
The first half of the course (13 lectures) expands on topics introduced in first year Learning and Motivation, with an emphasis on behavioural principles and findings that have important practical implications. The second half of the course (13 lectures) follows first year Psychobiology, Sensory Systems and Perception, developing a number of themes from that course and introducing new ones. The emphasis is on understanding the brain mechanisms underlying behaviour, perception and cognition.

Teaching outcomes:

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1. Understanding basic properties of conditioning, especially instrumental learning.
2. Understanding some of the neurochemical bases of reinforcement, addiction and anxiety.
3. Understanding comparative studies of complex learning, problem solving and memory.
4. Awareness of the relationship between theoretical research and practical applications of
   behavioural and physiological findings.
5. Understanding basic processes of human visual perception
6. Understanding basis properties of olfaction
7. Awareness, and some hands-on experience, of animal-based behavioural research.
8. Skill in reporting experimental work using standard conventions

Evidence of learning:

Achieving a Pass standard in the examination demonstrates success in achieving outcomes 1 – 6.
In addition successful achievement of Outcomes 1, 7 and 8 is shown by completion of the laboratory report at
a Pass standard and of Outcome 2 by a Pass mark in the Tutorial Quiz.

SYLLABUS

Fundamental principles of instrumental conditioning based on animal research, involving both positive and
aversive events, and their neural and pharmacological bases; social learning; 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 visual perception and underlying
brain mechanisms.

TIMETABLE

<table>
<thead>
<tr>
<th>WEEK</th>
<th>LECTURES</th>
<th>TUTORIALS</th>
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<tbody>
<tr>
<td>1</td>
<td>1. Instrumental conditioning</td>
<td>No meeting</td>
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<td>2. Partial reinforcement and extinction</td>
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<td>2</td>
<td>3. Comparative studies of memory</td>
<td>Intro to animal laboratory</td>
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<td>4. Time, number and order</td>
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<td>3</td>
<td>5. Spatial learning and navigation</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; practical: Habituation and magazine training</td>
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<td>6. Communication and language</td>
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<td>4</td>
<td>7. Evolution and intelligence</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; practical: Establishing an instrumental response</td>
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<td>8. Fear: Measurement and conditioning</td>
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<td>5</td>
<td>9. Aversive conditioning and consequences</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; practical: Partial reinforcement</td>
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<td>10. Fear, defence and recuperation</td>
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<td>6</td>
<td>11. Fear, anxiety, stress and distress</td>
<td>4&lt;sup&gt;th&lt;/sup&gt; practical: Schedules of reinforcement</td>
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<td>12. Social learning and imitation</td>
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<td>7</td>
<td>13. The analysis of behaviour and its applications</td>
<td>5&lt;sup&gt;th&lt;/sup&gt; practical: Extinction and conditioned reinforcement</td>
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<td>14. Neural basis of instrumental reinforcement</td>
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<td>15. Addiction: neural and pharmacological bases (1)</td>
<td>6&lt;sup&gt;th&lt;/sup&gt; practical: Comparing the effectiveness of two reinforcers</td>
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<td>16. Addiction: neural and pharmacological bases (2)</td>
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<td>9</td>
<td>17. Anxiety and fear: pharmacology</td>
<td>7&lt;sup&gt;th&lt;/sup&gt; practical: The human brain</td>
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<td>18. Anxiety and fear: neural substrates</td>
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<td>10</td>
<td>19. Learning and memory: pharmacology</td>
<td>8&lt;sup&gt;th&lt;/sup&gt; practical: The microscopic brain</td>
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<td>20. Learning and memory: pharmacology</td>
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<td>11</td>
<td>21. Offaction: basic mechanisms</td>
<td>9&lt;sup&gt;th&lt;/sup&gt; practical: The visual brain</td>
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<td>22. Offaction: learning and memory</td>
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<td>12</td>
<td>23. Visual perception 1</td>
<td>10&lt;sup&gt;th&lt;/sup&gt; practical: Limbic system and laterality</td>
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<td>24. Visual perception 2</td>
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<td>13</td>
<td>Public holiday</td>
<td>Tutorial quiz and course evaluation</td>
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<td>25. Visual perception 3</td>
<td>10 June – 13 June</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.

Domjan, M. (2003). The principles of learning and behavior. 5th edition. Pacific Grove, CA: Brooks Cole. (This text will be particularly useful in Weeks 1-7 and will also be used in the 3rd Year course on 'Learning and Motivation')

Carlson, N.R. (2002). Foundations of physiological psychology. 5th edition. Needham Heights, Mass: Allyn & Bacon. (This text will be particularly useful in Weeks 7-13 and will also be used in the 3rd Year course on 'Behavioral 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 sources:
