PSYC3013 – Perceptual Systems

Unit of Study Code: PSYC3013

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Tutors
Professor David Alais (contact details above).
Associate Professor Alex Holcombe (contact details above).

Format of Unit:
2x1 hour lectures/week x 13 weeks
1 x 2 hour tutorial/week x 10 weeks

Credit Point Value: 6 Credit Points

Prerequisite: Intermediate Year Psychology units including PSYC (2011 or 2111) and at least one other Intermediate Psychology Unit from PSYC (2012 or 2112), PSYC (2013 or 2113), PSYC (2014 or 2114).
Completion of compulsory components is necessary to pass this unit. Students who fail to do so will receive an Absent Fail regardless of their final overall mark.
It is very important that you read the general administrative guidelines for submission of written work, penalties for late work, assessment criteria, procedures for applying for extensions and special consideration in the Undergraduate Student Guide – available on the e-learning site as well as here:


Also, students who apply for and are granted either special arrangements or special consideration for examinations in units offered by the Faculty of Science will be expected to sit any replacement assessments in the two weeks immediately following the end of the formal examination period. Later dates for replacement assessments may be considered where the application is supported by appropriate documentation and provided that adequate resources are available to accommodate any later date.
More details on assessment tasks:

Class work (50%):

1) **Group Report**: “Blind spot experiment”, max 2000 words (25% of total mark)
   In this report, your group of 3 will design an experiment related to the retinal blind-spot and write it up, including: background literature, a motive and hypothesis in the Introduction, a clear description of materials and methods, Results, Discussion.
   Tutorial 6 (i.e., week 7: 8-11 September) is dedicated to discussing your plans and experimental design with your tutor who will provide helpful guidance and feedback.
   Full report due 29th September (Monday of Mid-semester break)

2) **Group presentation**: Your group of 3 will give a presentation on a perceptual disorder chosen from a list of disorders that you will be given several weeks in advance (10% of total mark). Presentation done as a group during Tutorial 9 (week 11, 13-16 October).

3) **Tutorial quiz**: Tutorial 10 is a quiz assessing the tutorial material, to be done during tutorials of week 13, 27-30 October (12% of total mark).

4) **Tutorial attendance & participation**: 3% of total mark.
   **Tutorial attendance requirement**: It is a requirement to pass the course that you attend a minimum of 80% of the tutorials (i.e., no more than 2 absentees from the 10 tutorial classes). It is your responsibility to attend the class you are enrolled in and to be marked as present. Note that if you miss your allocated class and attend another one to ‘catch up’, it is your responsibility to ensure your original tutor is aware that you attended another class.
   Half of the attendance & participation mark is gained by satisfying the 80% attendance requirement (or by satisfactorily explaining absences if less than 80% are attended). The other half of the mark comes from active participation in the tutorial classes: e.g., initiating or contributing to discussion.

5) **Examination (50%)**: The exam contains multiple-choice questions and short-answer questions. The multiple-choice section and short-answer section are equally weighted (each section is worth 50% each of the exam mark). There are 50 multiple-choice questions (2 per lecture) and 5 short-answer questions requiring approximately a 1-2 page response.
Unit of study general description:

Perception poses many challenges: how do we see colour and movement? How do we perceive surfaces and materials? How does combining information from multiple senses improve our perception? This unit draws on behavioural and neurophysiological perspectives to deepen understanding of current research topics in perception.

The emphasis is on how visual information is processed to accomplish functions such as perceiving a single edge, extracting the contours that form a face, or the spatial relations needed to call offsides on the sports field. Students also gain conceptual tools for evaluating the empirical and theoretical worth of recent research in perception. Perception is one of the School of Psychology’s strongest research areas, and students will be taught by research-oriented academics with active laboratories.

During the tutorial component of the course students will develop a practical experiment in which they formulate and test a hypothesis. In this way students gain important research experience that gives them valuable insight into the scientific process as it exists both in professional work and in the empirical research project required for the Honours degree.

Evidence of learning:

Assessment of work completed in tutorials will take the form a quiz. Group class presentation and the report will assess understanding of the topics of selected readings and the ability to design and critically evaluate research. At the end of semester, an examination (short answer and multiple choice) will assess knowledge of the entire course including tutorial work, lecture material, recommended reading and all the stated teaching outcomes.

Lecture Program (Mon. 3pm, Wed. 3pm; Carslaw LT 275)

David Alais (Lecture 1)
- Introduction, course overview and themes

Alex Holcombe (Lectures 2-12):
- The retina, filling in blind spots
- Spatial resolution of vision and attention
- Temporal resolution of vision and attention
- Touch
- Grouping and objects

Bart Anderson (Lectures 13-16):
- Surfaces (colour, lightness)
- Segmentation (completion, occlusion, transparency)
• Material perception (gloss, translucency.)
• Shape perception

David Alais (Lectures 17-22):
• Combining audition and vision: neural structures & functions
• Audiovisual interactions in attention and perception
• Fusing audiovisual information and dealing with discrepancy
• Early vs. late multisensory integration; time perception
• Temporal processes in multisensory perception
• ‘Virtual’ auditory space and auditory localisation

Patrick Goodbourn (Lecture 23):
• Genetics and perception

Frans Verstraten (Lectures 24-25):
• Perceptual disorders
• Applied vision

NOTE: some changes in lecture program are likely, for notice see Blackboard

Tutors:
Professor David Alais (david.alais@sydney.edu.au): M16A and R10A
Associate Professor Alex Holcombe (alex.holcombe@sydney.edu.au): W10A and W16A

Tutorials are a mix of class demonstrations, computer-based tutorials, and discussion.
## Timetable

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture dates</th>
<th>Tutorials</th>
<th>Lecturers</th>
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<tbody>
<tr>
<td>1</td>
<td>28, 30 July</td>
<td>No tute</td>
<td>Alais, Holcombe</td>
</tr>
<tr>
<td>2</td>
<td>4, 6 Aug</td>
<td>Tutorial 1: Blind spot and filling in; project info</td>
<td>Holcombe</td>
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<tr>
<td>3</td>
<td>11, 13 Aug</td>
<td>Tutorial 2: Touch, tactile acuity, receptive fields intro; form groups</td>
<td>Holcombe</td>
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<tr>
<td>4</td>
<td>18, 20 Aug</td>
<td>Tutorial 3: Receptive fields; work on project</td>
<td>Holcombe</td>
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<tr>
<td>5</td>
<td>25, 27 Aug</td>
<td>Tutorial 4: Signal Detection Theory</td>
<td>Holcombe</td>
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<tr>
<td>6</td>
<td>01, 03 Sep</td>
<td>Tutorial 5: Work in class on blind spot project; Tutor feedback</td>
<td>Holcombe</td>
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<tr>
<td>7</td>
<td>08, 10 Sep</td>
<td>Tutorial 6: Motion perception</td>
<td>Anderson</td>
</tr>
<tr>
<td>8</td>
<td>15, 17 Sep</td>
<td>No tute: work on your project. <strong>PROJECT DUE MONDAY 29th SEPT</strong></td>
<td>Anderson</td>
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<tr>
<td>9</td>
<td>22, 24 Sep</td>
<td>Tutorial 7: Applied Vision Science</td>
<td>Alais</td>
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**AVCC COMMON VACATION WEEK: NO CLASSES/TUTORIALS (29 SEP – 03 OCT)**

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<tr>
<th>Week</th>
<th>Lecture dates</th>
<th>Tutorials</th>
<th>Lecturers</th>
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<tr>
<td>10</td>
<td>06, 08 Oct (06 Public Hol.)</td>
<td>No tutorials (prepare presentations)</td>
<td>Alais</td>
</tr>
<tr>
<td>11</td>
<td>13, 15 Oct</td>
<td>Tutorial 8: Perceptual disorders <strong>PRESENTATIONS</strong></td>
<td>Alais</td>
</tr>
<tr>
<td>12</td>
<td>20, 22 Oct</td>
<td>Tutorial 9: Audition</td>
<td>Alais, Goodbourn</td>
</tr>
<tr>
<td>13</td>
<td>29, 29 Oct</td>
<td>Tutorial 10: <strong>TUTORIAL QUIZ</strong></td>
<td>Verstraten</td>
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READINGS


2. Journal articles and chapters from selected books (to be announced in lectures, often on library electronic reserve).

Graduate Attributes and Learning Outcomes for Perceptual Systems (PSYC3013)

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. They will be assessed in the laboratory report, group presentation, tutorial quiz, and final examination.

1: Knowledge and Understanding of Perceptual Systems

Display basic knowledge and understanding of the major concepts, basic facts, and developing understanding of biological perceptual systems. Human visual processing will be the most emphasised aspects, but other senses will also be included.

Student learning outcomes:
(i) Knowledge of several of the perceptual problems the brain must solve (such as combining information from distinct senses)
(ii) Appreciation of common processing principles for how the brain solves perceptual problems (such as adaptation)
(iii) Conceptual understanding of the limits on human perception and how they relate to the underlying mechanisms (such as acuity)
(iv) Understanding of specific perceptual phenomena and how they arise as a consequence of processing architecture, especially in vision and audition
(v) Basic knowledge of the methods and measures commonly used in perception research
(vi) Ability to understand and evaluate empirical studies in perception

2: Research Methods in Perceptual Systems

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

Student learning outcomes:
(i) To develop an understanding of the major methods of perceptual research
(ii) Critically assess research findings and related theories in these areas
(iii) Design and conduct basic studies to address perceptual 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 Perceptual Systems

Respect and use critical and creative thinking, skeptical inquiry, and the scientific approach to solve problems related to perception.

*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) Think about how perception might be achieved mechanistically
(iv) Evaluate issues using different theoretical and methodological approaches.
(v) Use reasoning and evidence to recognise, develop, defend, and criticise arguments.

4: Ethics in research

Respect and observe principles of ethics in research. Students research projects conducted in class involve informed, consenting subjects and all data are anonymous and cannot be linked directly to any individual. Data are stored securely in anonymised format for the statutory period.

5: Communication Skills in Perceptual Systems

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.
(iii) Demonstrate effective oral communication skills.
(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 Perceptual Systems

Understand and apply psychological principles to personal and social issues.

*Student learning outcomes:*
(i) Develop an awareness of the applications of the theories and findings in the area.
(ii) Apply psychological concepts, theories, and research findings to problems in everyday life and in society.
(iii) Understand major areas of applied Perceptual Psychology