**THE UNIVERSITY OF NEW SOUTH WALES**

**SCHOOL OF PSYCHOLOGY**

**PSYC3211 COGNITIVE SCIENCE**
**Session 2, 2012**

**Course Coordinators:**
Dr Tom Beesley Mat 1006, 9385 3032, (t.beesley@unsw.edu.au)
A/Prof Ben Newell, Mat 712, 9385 1606 (ben.newell@unsw.edu.au)

**Description**
This course covers a range of topics in cognitive science. The main areas are computational modeling, decision making, models of memory, learning and categorization. **Computational modeling** will explore different approaches to modeling cognition, from networks of simple units, to rule based processes. We will examine the benefits of formal models to address a range of questions in cognitive science, and apply different types of model to address a number of issues in cognitive psychology. **Decision-making** attempts to answer the following questions: What is a decision? What makes a decision good or bad? Do we make rational decisions? Are we constrained to fall prey to systematic biases when we make judgments? How do emotions affect our decisions? In **Models of Memory**, we will look at mathematical models of short- and long-term memory. We will focus on cases in which such models have revealed surprising and important results regarding questions such as: Does working memory have a fixed capacity of only 3-4 of whole items? Do visual memories decay or suffer a sudden death? Do older people have worse memory than younger people? **Learning** will explore foundational issues in human associative learning processes. How is human learning related to animal learning? How does learning interact with attentional processes? What is the role of awareness in learning? **Categorisation** examines how and why do people organise things in their physical and social environment into groups (e.g., dogs vs. cats, male vs. female, left-wing politician vs. right-wing politician)? It will address issues such as how do people learn to categorise? How are categories organised? What are the functions of categories? How do people use categories in reasoning and decision-making?

This course adds new components to the study of cognitive psychology, particularly focusing on computational analyses of cognition. Some topics are similar to those covered in PSYC2071, but where this is the case, a more detailed treatment will be given to these areas, and an attempt will be made to relate a number of theoretical ideas in learning, memory, decision-making and categorisation processes.

**Lectures**
The primary objective of the lecture course is to investigate cognition in greater depth and to relate different areas of cognition to each other. You should come away from the course with a good understanding of the main issues in current research on computational modeling, decision making, learning, memory and categorization. Certain issues will be treated in more depth in order to familiarize you with the specific methods used to investigate these issues and the important results that have been generated.

The main aim is to provide a conceptual understanding of the issues. The final exam will test this understanding. We shall attempt to pose questions in this exam that test your conceptual understanding rather than your ability to reproduce the lecture notes.

**Tutorials**

The tutorials will be a combination of demonstrations of 'classic' experimental phenomena, discussion of journal articles and the opportunity to devise, implement and analyse an experiment. As such the tutorials teach two specific skills that are of central importance to scientists. These are: 1) to critically evaluate empirical findings and journal articles; 2) to design novel tests of existing theories and to implement those designs in laboratory-based experiments.

*Graduate Attributes of the Australian Undergraduate Psychology Program*

The lectures, reading material, experimental work and tutorials combine to teach the six Graduate Attributes of the Australian Undergraduate Psychology Program (see Cranney, 2008):

1) *Graduate Attribute 1: Knowledge and Understanding of Psychology* major concepts, theoretical perspectives, empirical findings, and historical trends in the core cognitive science topics.
2) *Graduate Attribute 2: Research Methods in Psychology:* Understand, apply and evaluate basic research methods in psychology, including research design, data analysis and interpretation, and the appropriate use of technologies. This will be addressed via the experimental project undertaken and written up in the second part of the course.
3) *Graduate Attribute 3: Critical Thinking Skills in Psychology:* Respect and use critical and creative thinking, sceptical inquiry, and the scientific approach to solve problems related to behaviour and mental processes. This will be addressed in lectures and tutorials via interaction, discussion and systematic analyses of journal articles and empirical results.
4) *Graduate Attribute 4: Values in Psychology* Value empirical evidence; tolerate ambiguity during the search for greater understanding of behaviour and knowledge structures; act ethically and professionally; understand the complexity of sociocultural and international diversity; and reflect other values that are the underpinnings of psychology as a discipline. This will be addressed by your participation in experimental work.
5) *Graduate Attribute 5: Communication Skills in Psychology:* Communicate effectively in a variety of formats and in a variety of contexts. You will need to communicate both orally and literally in your completion of the course assessments and via participation in lectures and tutorials.
6) *Graduate Attribute 6: Learning and the Application of Psychology:* Understand and apply psychological principles to personal, social, and organisational issues. Attempts will be made throughout the lectures to identify the applications of key empirical findings from research on decision making, learning, and categorization to understanding the world around us.

**Lectures:** Wed 5-6 (Matthews B) and Thursday 11-12 (Matthews B).
Recordings of the lectures and the lecture notes will be available on Blackboard.

| | | | |
|---|---|---|---|
| Dr Tom Beesley | MAT 1006 | 9385 3032 | (t.beesley@unsw.edu.au) |
| Dr Chris Donkin | MAT 706 | 9385 9444 | (c.donkin@unsw.edu.au) |
| Dr Don van Ravenzwaaij | MAT 702 | | (d.vanravenzwaaij@unsw.edu.au) |
| A/Prof Ben Newell | MAT 712 | 9385 1606 | (ben.newell@unsw.edu.au) |
| A/Prof Brett Hayes | MAT 713 | 93853713 | (b.hayes@unsw.edu.au) |

**Readings:** Selected readings will be provided at the start of each topic. These lists will also appear on Blackboard in many cases, these will be accompanied by pdf copies of the article. Recommended texts will also be advised at the start of each component. There is no 'set-text' for the whole course.

**Tutorials:** Wed 3-5 (MAT 421); Thurs 2-4 (Mat 421); Thurs 4-6 (Mat 421); Fri 11-1 (MAT 313); Fri 2-4 (MAT 307). **Tutors:** Sule Guney, Christin Schulze, Tom Beesley and Chris Donkin. Students who do not attend tutorials, and later submit special consideration requests (for example for the exam), may not have those requests taken into account.

**Course Requirements and Assessment:**
- A multiple choice quiz in Week 6 will be worth 15% of the total mark. The questions in the quiz will assess knowledge of the course content covered up to that point.
- The Written Assignment will begin in the tutorial in Week 8 and will be due on the day of your tutorial in Week 13. In this assignment you will conduct an experiment, analyze the data, and write a lab report communicating the results. This assignment has a limit of 1500 words and is worth 35% of the total mark. A late submission penalty of 2% per day applies.
- The final exam will be worth 50% of the total mark – it will assess content from ALL LECTURES.

**Assessment information and assessment structure**.
Deferred and alternative assessment materials may be in a different format from the original (i.e. short answers instead of MC questions, oral examination instead of written examination etc). In addition, the original and deferred assessment materials may also differ in the specific content, although overall both will be sampled for the same relevant course material. These principles will apply to both deferred final examination and alternative in-session assessments.

Students can attend the final examination only once, either in the regularly scheduled or deferred examination period. As students will not be permitted to attend both the regularly scheduled and deferred examinations, they should be advised not to attend the exam as originally scheduled if sick on that day. Instead, they should ensure the appropriate medical certificate to support their case for deferred medical exam. In such a case, a formal application for special consideration must be submitted to Student Central within three working days of the assessment to which it refers.

A deferred examination opportunity for each course will be offered only ONCE.

**Assessment submissions.**
Hard copies of the Written Assignment must be submitted to the drop box located at the School Office on Level 10 (Mathews Room 1011) by 4.30pm on the day it is due or earlier. These will be date stamped by the School Office and taken as a formal evidence of submission.

In addition, an electronic version must also be lodged into the Blackboard course module as a Turnitin assignment for plagiarism checking, and as insurance in the case of misplaced hard copies of submitted assignments. If students fail to do this, there will be no proof that the assignment was handed in on time and onus is on students to prove submission.

 Late submissions may not receive detailed feedback.

**Course Schedule:**

| | **Lecture 1 (Wednesday)** | **Lecture 2 (Thursday)** | **Tutorials** |
|---|---|---|---|
| Week 1 | Computational Modeling I (TB) | Computational Modeling II (TB) | *No tutorials* |
| Week 2 | Computational Modeling III (TB) | Decision Making I (BN) | *No tutorials* |
| Week 3 | Decision Making II (BN) | Decision Making III (BN) | Decision Making Practical I |
| Week 4 | Decision Making IV (BN) | Decision Making V (BN) | Decision Making Readings |
| Week 5 | Decision Making VI (DvR) | Decision Making VI (DvR) | Decision Making Practical II |
| Week 6 | Models of Memory I (CD) | Models of Memory II (CD) | Mid-Session Quiz |
| Week 7 | Models of Memory III (CD) | Models of Memory IV (CD) | Memory Practical |
| Mid- Semester Break | | | |
| Week 8 | Models of Memory V (CD) | Learning I  (TB) | Practical |
| Week 9 | Learning II (TB) | Learning III (TB) | Experiment: preparation |
| Week 10 | Categorisation I (TB) | Categorisation II (TB) | Experiment: data collection |
| Week 11 | Categorisation III (BH) | Categorisation IV (BH) | *No tutorials* |
| Week 12 | Categorisation V (BH) | Categorisation VI (BH) | Experiment: presentation |
| Week 13 | NO LECTURE | NO LECTURE | NO TUTORIALS Assignment Due |