307 Human Neuropsychology – Fall 2007

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*** Tuesdays and Thursdays 8:30 - 9:50 a.m. AL 208 ***

Teaching Assistants
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Office hours to be announced in class.

Course Web Page: http://www.arts.uwaterloo.ca/~jdancker/hum_npsy/hnpsy_index.htm
Lecture slides are available in powerpoint (large files to download), html (to read on-line) and in pdf notes form (these are also large but can be downloaded prior to class).

Course Description and Aims
This course will provide you with a broad understanding of methods in human neuropsychological research including functional imaging and group and single case lesion studies, as a means of providing a broad understanding of human neuropsychology. Both basic research and clinical examples will be used to explore the brain - behaviour relationships inherent in motor control, language, vision and attention, memory, and executive control. The course will be run in three separate sections with each section examined in class (exams will not be cumulative).

Assessment
Each section's exam will be a mixture of multiple choice, fill-in-the-blanks, diagrams and short answer questions. Each exam will be worth 25% of the final grade (total of 75%).

Five percent (5%) of your grade can come from participation in experiments through the Research Experiences Group (REG; see details below under **Participation in Psychology Research**). In this instance .5% can be earned by participating in one half hour experiment, so to get the full 5% you will need to complete 5 full hours of experiments (see details below). If you decide you do not want to participate in experiments you can complete an alternate assignment to be determined by Dr. Danckert (alternate assignments will each be worth 1% so if you choose to collect 4 experimental credits you can make up the final 1% through an assignment).

The final 20% of your grade will come from a written assignment. You can choose from the following assignments all of which have the same following constraints:

- must be double-sided 12 point font
- maximum word limit INCLUDING references of 5,000 words

- references can NOT all come from the web – source material MUST include some original journal articles

Choose one of the following options for your assignment.

1. A patient who has suffered a stroke comes into your office presenting with the following symptom: she massively underestimates the duration of multisecond intervals. What experiments would you perform (what data would you think is necessary to collect?) to try to understand the cause of this symptom and rule out alternate explanations for it? In other words, design a single case study of this patient intended to provide a thorough explanation for her deficit.

2. Your research program focuses on understanding the neural mechanisms that subserve language functions. To date you have focused mainly on single case studies of patients with left hemisphere lesions, but you just recently got a grant that will allow you to expand your focus. How would you go about exploring the neural bases of language functions given your now almost limitless funding situation? Explain why each approach you will take will improve upon the work you have done in the past.

3. As a recent convert to fMRI as a tool in neuroscience you are not convinced that the brain truly is modular (as most fMRI phrenologists would claim). Editors at the journal *Nature* happen to agree with you. They have given you an unprecedented opportunity to design an experiment (or series of experiments) for publication in the journal that will shoot down modularity as a concept once and for all. What will you do?

Due date for the assignment is November 8th.
Experimental credits must all be finalised by November 21st (the week before last class).

Course Text
Banich, M. T. *Cognitive Neuroscience and Neuropsychology*, (2003) Houghton Mifflin Co. New York.

Course Outline
Section 1

Sep 11th Lecture 1 Introduction to Human Neuropsychology
Sep 13th Lecture 2 History of Neuropsychology (no readings)
Sep 18th and 20th Lectures 3 & 4 Psych 261 Refresher: Neuroanatomy and Methods (Banich Ch 1 & 2)
Sep 25th Lecture 5 Single Case Methodology (handouts)
Sep 27th Lecture 6 Hemispheric Specialisation: Automatic Brains and Interpretive Minds (Banich Ch 3 and Gazzaniga refs)

***** Section 1 exam – Tuesday Oct 2nd *****

Section 2

Thursday Oct 4th Lecture 7 Motor Control (Banich Ch 4)
Tuesday Oct 9th Lecture 8 Basic Vision (no reading)
Thursday Oct 11th Lecture 9 What vs. How - Perception vs. Action
Tuesday Oct 16th Lecture 10 What, How and When? Three visual pathways in the human brain?
Thursday Oct 18th Lecture 11 Object Recognition and Visual Agnosia (Banich Ch 5)
Tuesday Oct 23rd Lecture 12 Spatial Processing and Optic Ataxia (Banich Ch 6)
Thursday Oct 25th Lecture 13 Attention (Banich Ch 7)

***** Section 2 exam – Tuesday Oct 30th *****

Section 3

Thursday Nov 1st Lecture 14 Unilateral Neglect – a disorder of space, attention or…?
Tuesday Nov 6th Lecture 15 Time in the brain – do we have internal clocks?
Thursday Nov 8th Lecture 16 Language and Aphasia (Banich Ch 8)
Tuesday Nov 13th Lecture 17 Memory and Amnesia (Banich Ch 9)
Thursday Nov 15th Lecture 21 The Frontal Lobes and Executive Function (Banich Ch 10)
Tuesday Nov 20th Psychoses and Dementias (Banich Ch 14)
Thursday Nov 22nd Boredom, consciousness and common underlying mechanisms.
Tuesday Nov 27th Final Lecture: Course refresher.

***** Section 3 exam – Nov 29th *****

Participation in Psychology Research:
Guidelines for Psychology Undergraduate Courses

Experiential learning is considered an integral part of the undergraduate program in Psychology. Participation in research is one example of this. A number of undergraduate courses have been expanded to include opportunities for Psychology students to volunteer as research participants enabling them to learn first-hand about psychology research and related concepts. Many students report that participation in research is both an educational and interesting experience.

Student participants may earn up to 5 percentage points towards their final mark in Psychology 307 by participating in studies conducted by students and faculty in the Department of Psychology. Participation is worth .5 participation credits (percentage points) for each half hour session. Researchers will record student's participation and will advise the course instructor of the total points earned by each student at the end of the term. Students who do not wish to participate in research may choose an alternative approach to earning the same number of points; this is explained below in "Alternative to participating in research".

Since experiential learning is highly valued in the Department of Psychology and part of this course, students can earn up to 5% of their final grade by participating in these experiments.

Please note that all Psychology studies have undergone prior ethics review and clearance through the Office of Research Ethics.

<u>Educational focus of participation in research</u>

To maximize the educational benefits of participating in research, students will receive feedback information following their participation in each study detailing the following elements:

- Purpose or objectives of the study
- Dependent and independent variables
- Expected results
- References for at least two related research articles
- Provisions to ensure confidentiality of data
- Contact information of the researcher should the student have further questions about the study
- Contact information for the Director of the Office of Research Ethics should the student wish to learn more about the general ethical issues surrounding research with human participants, or specific questions or concerns about the study in which sh/he participated.

<u>Alternative to participating in research</u>

Students are not required to participate in research, and not all students wish to do so. As an alternative to participation in research, students may opt to review articles relevant to psychology and write a short 1 page review. Each review article counts as one percentage point. The instructor will provide the articles to be reviewed. The review must:

- Be submitted by November 21st
- Be typed
- Include title, author, source and date of the article. A copy of the article must be attached.
- Identify the psychological concepts in the article and indicate the pages in the text that are applicable.
- Clearly evaluate the application or treatment of those concepts in the article.

Students may complete any combination of a) participation in research or b) article review up to a total of 5% points.

How do I sign up?
REG has created an account for you on SONA (our web-based Study Sign-Up system) at http://uwaterloo.sona-systems.com . User ID is your Quest ID (eg. j2smith), temporary password is your Student ID (eg 2001234). Log in to your account, read/acknowledge the ORE "Human Subjects/Privacy Policy" then complete a very brief (5-10 minute) "Prescreen" questionnaire to provide basic demographic info. You won't receive a credit for this and you may decline if you wish however completing it will increase your eligibility for other studies. Once you have completed (or declined) the Prescreen questionnaire you should go to "My Profile" and enter your preferred (Alternate) email address. Then you can go to "Study Sign-Up" and select a Psych 307-eligible study that interests you and a day/time that fits your schedule. You'll receive a confirmation email and a reminder the day before the study. Upon completion of the study you are granted your Study Credit and given feedback about the study hypothesis, design and predictions. You can use this to complete the Experimental Write-Up (the professor will explain this).

When should I sign up?
Right away, the sooner the better!!! The On-line study "Mass Testing Survey F07" (one full credit) will only be offered for a few weeks and you should do this study as soon as possible. Researchers often select participants based on their responses and doing this survey increases your eligibility for other studies. Note that you can only do this survey if you have completed the Prescreen questionnaire. We'd appreciate it if you'd do both.

Are there any restrictions to the studies I can sign up for?
Yes … i) the study must be eligible for a credit in this class (as noted in the study description) ii) only 2 of your 5 credits can be for On-line studies and iii) you should try to spread your participation out over the term. The last day to participate for credit is Dec 3. You can participate for pay anytime.

Where can I get more information, instructions, help with login problems etc?

REG website: http://www.arts.uwaterloo.ca/~regadmin/regparticipant
REG Coordinator: regadmin@watarts.uwaterloo.ca