Cognitive Neuroscience

I) Course information

Course number: PSYC55

Mondays, 1 pm – 3 pm
Section: L01 2004 S
Place: SW 143

Prerequisites: PSYB57 & PSYB65

II) Instructor:

Dr. Matthias Niemeier
1265 Military Trail S572
phone: 416-287-7466
e-mail: niemeier@utsc.utoronto.ca I will respond within two working days.
Office Hours: Mondays, 3 pm – 5 pm and by appointment. Contact me by e-mail to set up a time.

I received my MA at the University of Hamburg (Germany) and my PhD at the University of Tübingen (Germany). From October 2000 – June 2003 I've been working as a postdoctoral fellow at UofT's Department of Physiology. Since July 1st, 2003 I'm an assistant professor at UTSC.

III) Teaching Assistant:

Pria Nippak.
e-mail: pria.nippak@utoronto.ca

IV) Course coverage and goals

PSYC55 aims at introducing you to the interdisciplinary field of cognitive neuroscience. The course has two goals. The first is to provide you with a "tool-kit" of knowledge about the field. – WHAT are the important methods and findings relating brain functions to cognitive processes? Here are some of the methods that will be covered: neurophysiological methods, studies on brain-damaged patients, transcranial magnetic stimulation, functional imaging, and computer simulations. I will talk about cognitive functions such as perception, control of motor actions, attention, memory, language, and executive functions. Another goal of the course is to look at questions such as, WHY does the brain work the way it works? That is, I hope the course will help you understand the key issues and principles of cognitive neuroscience. Also, the course will hopefully help to further your critical thinking and your scientific creativity, both necessary to come up with new ideas and questions.

V) Textbook

Required
Title: Cognitive Neuroscience – the Biology of the Mind, 2nd edition
Authors: M.S. Gazzaniga, R.B. Ivry and G.R. Mangun
Publisher: W W Norton & Company: New York
ISBN: 0-393-97777-3

VI) Web pages

Course Web Site: http://www.utsc.utoronto.ca/~niemeier/teaching/PSYC55/
Here you will find the syllabus, instructions for the papers, the most up-to-date version of the lecture schedule, and announcements. Also, I will put the lecture slides on that page.

Intranet: Please check on a regular basis for announcements.

Tips for writing can be found at: http://www.utoronto.ca/writing/advise.html

VII) Evaluation

Overview:
I hope that the cognitive neuroscience course will provide you with a sound knowledge about the field, and a good understanding of the important mechanisms. Besides that I think that independence and critical thinking are very important for psychology (and other sciences as well). Therefore, I will determine your grade based on two exams (50% of the total grade) and on papers written by you (50% of the total grade). Here are the details:

10% First reaction paper. Choose a topic from chapter 5 or 11. Please go to http://www.utsc.utoronto.ca/~niemeier/teaching/PSYC55/ for tips and instructions on "How to write a reaction paper". This first reaction paper will be due on **February 4, 2004**.

15% Mid-term test. Scheduled for **February 23, 2004**. Two hours, in class.

10% Second reaction paper. Choose a topic from chapter 6 or 7. Again, please go to http://www.utsc.utoronto.ca/~niemeier/teaching/PSYC55/ for tips and instructions on "How to write a reaction paper". The second reaction paper will be due on **February 25, 2004**.

30% Research proposal. The proposal is due on **March 31, 2004**. Please go to http://www.utsc.utoronto.ca/~niemeier/teaching/PSYC55/ for tips and instructions on "How to write a research proposal".

35% Final Term test. TBA. Two hours, **not** in class.

Exams:
Material on the exams will include both lecture material and text readings. Although the topics covered will overlap, different things may be emphasized in class than in the book. Therefore, class attendance is highly recommended. E.g., you need to come to class to hear the details and see videos and demonstrations. The text is intended to reinforce and supplement material presented in class.

Reaction papers:
You are to write two reaction papers of about 1000 words each, maximum 4 type-written pages (including figures and tables), double-spaced. Fonts should be set at 12-point. For the first reaction paper choose a topic from chapter 11 (Control of Action) or 5 (Perception and Encoding). For the second reaction paper choose a topic from chapter 6 (Higher Perceptual Functions) or 7 (Selective Attention and Orienting).

Objectives
Writing a research proposal will help you to develop your skills as a critical reader of psychological research and to develop your scientific writing skills.

You are to think about a particular topic covered in the lecture and reading of your choice and to write your reaction to it. This paper should not be a summary, it should be a description of things you liked, disliked or thought could be done differently. So, the paper could be a question, a criticism or a problem, an alternative interpretation of experiments, or a suggestion for follow-up experiments. In addition to the book chapter, choose **two** recently published research articles (experimental reports published in the last two years, NOT reviews or books).The articles have to be from the following journals:

- Brain
- Cerebral Cortex
- Current Biology
- Experimental Brain Research
- Journal of Cognitive Neuroscience
- Journal of Neuroscience
- Journal of Neurophysiology
- Nature
- Nature Neuroscience
- Neurology
- Neuropsychologia
- Neuron
- Psychological Science
- Science
- Vision Research

Deadline

Please submit your reaction papers as hard copies. The first reaction paper is due by noon (12:00 PM) Feb 4, 2004. The second reaction paper is due by noon (12:00 PM) Feb 25, 2004. Penalty for unjustified late assignment: 5% per day. Printer problems and other technical difficulties are not acceptable excuses for failure to hand in your reaction papers on time.

Research proposal:

You are to write a research proposal of about 2000 words, maximum 8 type-written pages (including figures and tables), double-spaced. Fonts should be set at 12-point.

Objectives

Writing a research proposal will help you achieve three important objectives:
(1) To expand your knowledge of cognitive neuroscience by focusing on two areas that are of particular interest to you, (2) To further develop your skills as a critical reader of psychological research, (3) To develop your scientific writing skills.

General Requirements

In this research proposal, you are asked to demonstrate your ability to integrate information across topics covered in the course. In the proposal, you should critically review two areas of cognitive neuroscience and then propose an experiment that would help to address an integrative question or issue.

Choose **any two sections** from the course outline, such as Attention and Memory, and discuss how they are (or might be) related. For example, you might want to discuss the role of attention in memory. Alternatively, you might wish to discuss some general principles of cortical organization, such as modularity and central processing, and how they apply to two different areas you have studied. You need not deal with the entire topic area (e.g., all of language, all of perception), but choose smaller,

more manageable topic (e.g., perception of living things and spatial attention; the function of the hippocampus and dorsolateral prefrontal cortex).

References
You must have **at least 3 primary sources** (journal articles, same list as for reaction papers). The references should be from the last two years. You must format your references using the guidelines developed by the American Psychological Association's Publication Manual (5th edition).

Required sections of the proposal
The proposal must contain the following sections: Abstract – Introduction – Methods – Predicted Results – References (for details please refer to "How to write a research proposal" on the course webpage at http://www.utsc.utoronto.ca/~niemeier/teaching/PSYC55/).

Use APA Format
You should use the guidelines for scientific writing that have been developed by the American Psychological Association (APA). The 5th edition of the APA Publication Manual is available at the UTSC Bookstore and at the Bladen Library: CALL NUMBER: BF 76.7 .P83 2001 SCAR -- BOOK – ShortTermLoan.

Deadline
Please submit your research proposal as a hard copy. It will be due by noon (12:00 PM) of Mar 31, 2004. Penalty for unjustified late assignment: 5% per day. Printer problems and other technical difficulties are not acceptable excuses for failure to hand in your proposal on time.

VIII) Schedule

This schedule is subject to changes as we go along. The most up-to-date schedule will be on the web.

Day	Topics	Chapter(s)
5 Jan	Welcome and History	1
12 Jan	The Functional Anatomy of the Brain	2, 3
19 Jan	Methods of Cognitive Neuroscience	4
26 Jan	Motor Control & Action	11
2 Feb	Perception & Object Recognition	5, 6
9 Feb	Attention	7
16 Feb	Reading Week	
23 Feb	***Mid-term, in class***	
1 Mar	Learning and Memory	8
8 Mar	Language	9
15 Mar	Lateralization and Specialization	10
22 Mar	Executive functions	12
29 Mar	Evolution and Plasticity	14, 15
TBA	***Final term test***	

IX) Course Policies
For academic regulations (such as UTSC's official grading practices policy, petitions, code of behaviour on academic matters etc.) please refer to the UTSC calendar.