

NROC64 COURSE SYLLABUS: WINTER 2007

SENSORY AND MOTOR SYSTEMS

COURSE DETAILS:

Course Instructor:

Gabriela Ilie, *Ph.D.*

Room S638

Email: gilie@psych.utoronto.ca

Website: www.psych.utoronto.ca/~ghusain

Office hours: Mondays 2 pm – 3 pm

Lectures: Mondays: 3-5 pm, HW216; Thursdays: 2-3 pm, HW216

Teaching assistant:

Vessela Stamenova

Email: vess.stamenova@utoronto.ca

Office hours will be posted on the intranet

Course Description

This course covers the neurobiology of sensory and motor systems. The goal is to understand how the external world is encoded (sensory coding), recognized (perception) and acted upon (motor control). The course will start with a general discussion of neural coding and representation. The next topic will be vision. We start with an analysis of retinal processes, which include image formation, visual transduction and retinal coding. This is followed by a discussion of CNS processing – the transformation of neural codes to visual perception. We will cover the other main sensory systems. These include the auditory system, somatosensory system (touch, pain), olfactory system and gustatory system. The last topic will be motor control. We will first look at muscle contraction, and the associated peripheral and spinal control mechanisms. We will then focus on the brain motor system and how this is involved in planning and triggering motor sequences.

Course materials

Grades will be based on two midterms (February 2nd, and March 12th) worth 25% each (50% in total) and a comprehensive final exam worth 50%. The exam will consist of MC, fill in the blank, true/false, and short answer questions. Examples will soon be posted on the intranet.

EMAIL:

For security purposes, and time considerations, student emails will be answered if and only if the subject line contains your name, student number, and course number. Please be advised that email attachments from students will not be opened for security reasons.

Attendance and Participation: Because the lectures will cover material that is not contained in the readings, class attendance is absolutely essential. Repeated late arrivals to class, or talking while the instructor or other students are speaking, are disrespectful to the instructor and other class members. Please be punctual and do not talk in class while others are speaking.

Cell Phones: Please respect others in the class by turning off all cell phones and pagers before entering the auditorium.

Special Needs: If you have a disability or other special needs, please notify me and the Dean's Office during the first week of the semester, and I will do my best to accommodate them.

Exam and tests penalties: Students who miss the mid-terms *must notify the instructor within 24 hours of the test date*. Make up exams/ quizzes will be allowed, only, and only if a UofT medical certificate will be provided and the information can be verified with the medical professional who issued the note. No other circumstances will be considered for requests to write a make up exam.

Additional readings (optional). Some of these readings will be mentioned during lectures.

Anderson, J.L., Schjerling, P., & Saltin, B. (2000). Muscles, genes and athletic performance. *Scientific American* (September) 283, 48-55.

Borg, E., & Counter, A. (1989). The middle-ear muscles. *Scientific American* (August), 261, 74-81.

Bower, J.M., & Parsons, L.M. (2003). Rethinking the lesser brain. *Scientific American* (July), 287, 54-60.

Catania, K.C. (2002). The nose takes a starring role. *Scientific American* (July), 287, 54-60.

Dahn, T. (2004). Dying to see. *Scientific American* (October), 29, 83-89. Freeman, W.J. (1991). The physiology of perception. *Scientific American* (February), 264, 78-87.

Freeman, W.J. (1991) The physiology of perception. *Scientific American* (Feb), 78-85.

Grillner, S. (1996). Neural networks for vertebrate locomotion. *Scientific American* (January), 274, 64-69.

Livingstone, M.S. (1985). Art, illusion and the visual system. *Scientific American*, 258, 78-85

Logothetis, N.K. (1999). Vision: a window on consciousness. *Scientific American* (November), 279, 69-75

Ramachandran, V.S. and Hubbard, E.M. (2004). Hearing colors, tasting shapes. *Scientific American* (May), 288, 53-59.

Weinberger, N.W. (2004). Music and the brain. *Scientific American* (Nov), 291, 88-95.

Required text: NEUROSCIENCE (2004), Third edition, Purves, Augustine, Fitzpatrick, Hall, LaMantia, McNamara, Williams, Sinauer Associates Inc.

COURSE SCHEDULE

<i>Week and Date</i>	<i>Topic</i>	
Chapter		
1- Jan 8-11	Introduction: The Somatic and Sensory System	
8		
2- Jan 15-18	Pain	9
3- Jan 22-25	Vision	10 and 11
4- Jan 29-Feb 1	Audition	12
5- Feb 5-8	First Midterm (In class Feb 5); The Vestibular System	13
6- Feb 12-15	The Vestibular System; The chemical senses	13 and 14
7- Reading week-no classes		
8- Feb 26-Mar 1	Lower Motor Neuron Circuits and Motor control	15
9- Mar 5-8	Upper Motor Neuron Control of the Brainstem and SC	
16		
10- Mar 12-15	Second Midterm, (In class Mar 12); Movement BG	17
11- Mar 19-22	Movement C	18
12- Mar 26-29	Eye Movement and Sensory integration	
19		
13- Apr 2-5	The Visceral Motor System	20
FINAL EXAM (date TBA)		

First Midterm Exam: will cover material from the lectures and text material chapters: 8, 9, 10, 11, and 12

Second Midterm Exam: will cover material from the lectures and text material chapters: 13, 14, 15, 16

Final Exam: will cover all material covered in the course. 8 through 20