SEMINAR IN NEUROSCIENCE: RHYTHMS OF THE BRAIN

Fall 2011

Explores the temporal dynamics of brain activity, from ultradian and circadian cycles to the high-frequency neural oscillations associated with attention and memory. Topics addressed include: sleep rhythms, hippocampal rhythms, central pattern generators, neocortical oscillations and memory consolidation.

Expanded description:
Describes examples of the neural circuits responsible for oscillations, or 'brain waves'. Emphasis is placed on the behavioral consequences of oscillatory activity, including rhythmic movement, stimulus discrimination, attention, and memory. Although not the primary emphasis, some mechanistic descriptions are also included. This course provides a more thorough treatment of some of the basic concepts of neural circuits introduced in PSYC 3250: Neural Basis of Behaviour, including activity from simple circuits, the olfactory system, hippocampus and neocortex. Implications for conditions such as sleep disorders, epilepsy, and attentional disorders are also discussed.

Th Sept. 8 INTRO – placement test
T Sept. 13 Cycle 2 Structure Defines Function
Th Sept. 15 Cycle 3 Funct. Diversity via Inhibition
T Sept. 20 Cycle 3 Funct. Diversity via Inhibition
Th Sept. 22 Cycle 4 Methods
T Sept. 27 Cycle 4 Methods
Th Sept. 29 Cycle 4 Methods
T Oct. 4 Review
Th Oct. 6 Exam 1

--- Co-Curricular week October 8-14 ---
T Oct. 18 Cycle 5 Systems of Rhythms
Th Oct. 20 Cycle 5 Systems of Rhythms/Sync
T Oct. 25 Cycle 6 Synchronization
Th Oct. 27 Cycle 6 Synchronization/Rest
T Nov. 1 Cycle 7 Rest
Th Nov. 3 Cycle 7/8 Rest/Perturbation
T Nov. 8 Cycle 8 Perturbation/Review
Th Nov. 10 Exam 2
**T Nov. 15 SFN ** presentations [x2]
Th Nov. 17 Cycle 8 Gamma Buzz []
T Nov. 22 Cycle 9 Perception/Brain state []
Th Nov. 24 Cycle 10 Navigation/Memory []
T Nov. 29 Cycle 11 Coupling by oscillations []
Th Dec. 1 Cycle 12 Coupling/Review [*]
T Dec. 6 Exam 3

Prerequisites: PSYC 3250 3.0 or transfer equivalent - no exceptions
AK/AS/HH/SC/PSYC 1010 6.00 or AK/HH/PSYC 2410 6.00, with a minimum grade of C; or permission of instructor
**Course Instructor:** Kari Hoffman  
x22932  
khoffman@yorku.ca

**Office Hours:** by appointment

**Course Web Sites:** www.yorku.ca/khoffman/courses

**Required texts:**
**Rhythms of the Brain** Gyorgy Buzsaki  
Additional required reading materials will be provided to the student.

**Course Evaluation:**
Students will be evaluated based on three exams, quizzes, participation, and presentation of a topic from the primary literature. Tests will be essay and short answer responses, testing the understanding and synthesis of materials covered in class.

Undergraduate final marks will be based on:
- Test (Series 1) 20%
- Test (Series 2) 20%
- Test (Series 3) 20%
- Short/Team Presentation 20%
- Participation 10%
- Quiz 10%

Graduate final marks will be based on:
- Test (Series 1) 20%
- Test (Series 2) 20%
- Test (Series 3) 20%
- Presentation 30%
- Participation 10%

N.B. An appeal against a grade assigned to an item of course work must be made in writing to the course director within 7 days of the graded work being made available to the class. The result of an appeal may cause the grade to increase, decrease or remain the same.

**Drop Date:**
Last Date to drop a course without receiving a grade: **Nov. 11.**

**Check website for official refund table:**

**unofficial – check website for official table**
- $15 Course Fee Withheld Up to and including Sept. 6
- 10% Course Fee Withheld Sept. 7 - 13
- 20% Course Fee Withheld Sept. 14 - 20
- 60% Course Fee Withheld Sept. 21 - 27
- No Credit Term F Sept. 28 - Oct. 3
Academic Integrity

It is the student’s responsibility to understand the Senate’s Policy on Academic Honesty. Ignorance of these policies is not accepted as an excuse for a violation.

Text-matching software: http://www.yorku.ca/academicintegrity/textmatching-guidelines.htm

Although numerical marks are assigned to each piece of work in this course there should be no assumption that a total number of marks translates directly to a lettergrade. Lettergrades will be determined by the descriptions in the York University Undergraduate Calendar.