

YORK UNIVERSITY  
 FACULTY OF HEALTH  
 PSYCHOLOGY DEPARTMENT  
 PSYC 4380 3.0 (W)  
**SEMINAR IN NEUROSCIENCE: RHYTHMS OF THE BRAIN**  
 Winter 2016

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:** Provides 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 hippocampus and neocortex. Implications for conditions such as sleep disorders, epilepsy, and attentional disorders are also discussed. Recommended hands-on companion course: PSYC 3010 Section M: Neural Signal Processing.

Jan. 5	INTRO – review Prelim test	
	Cycle 1	Intro
Jan. 12	Cycle 1,2	Structure Defines Function
Jan. 19	Cycle 3	Funct. Diversity via Inhibition
Jan. 26	Cycle 4	Methods [Lily]
<b>Feb 2 Exam 1,</b>	Cycle 5	Systems of Rhythms [Intro]
Feb 9	Cycle 5	Systems of Rhythms

--- Co-Curricular week Feb 16 class---

Feb 23	Cycle 6	Synchronization, stochastic resonance, cell assembly 'memory traces' [1]
	Cycle 7	Rest [2]
Mar 1	Cycle 7	Rest [2]
	Cycle 8	Perturbation by experience ('top-down' meets 'inside out') [1]
Mar 8 <b>Exam 2,</b>	Cycle 9	Gamma buzz
Mar 15	Cycle 9	Gamma [2]
	Cycle 10	State-dependent Perception [2]
Mar 22	Cycle 11	Navigation, Memory[2]
	Cycle 12	Coupling systems through Rhythms [2]
Mar 29 <b>Exam 3</b>		

**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 Site:** <https://moodle.yorku.ca>

**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%
- Presentation 20%
- Participation 10%
- Quizzes 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:**

**Check website for official refund table:**

<http://www.yorku.ca/sfs/refunds/tables/index.php?term=fw11&class=undergrad&section=general>

**\*\*unofficial – check website for official table\*\***

Jan 9 date to drop with full refund

**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>

Policy on Academic Honesty: <http://www.yorku.ca/secretariat/policies/document.php?document=69>

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.