

YORK UNIVERSITY
 FACULTY OF HEALTH
 PSYCHOLOGY DEPARTMENT
 PSYC 4380 3.0 (W)
SEMINAR IN NEUROSCIENCE: RHYTHMS OF THE BRAIN
 Winter 2017

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, mechanistic descriptions are included in the course. 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 other disorders and diseases are also discussed.

Jan. 10	INTRO – review Prelim test	
Jan. 17	Cycle 1,2	Structure Defines Function
Jan. 24	Cycle 3	Functional Diversity via Inhibition
Jan. 31	Cycle 4	Methods, intro
Feb. 7	Cycle 4	Methods, detailed (electrophysiology, optogenetics, MEG)
Feb 14	Exam 1	
--- Co-Curricular week Feb 21 class---		
Feb 28	Cycle 5	Cycle 5 systems of rhythms
Mar 7	Cycle 6 Cycle 7	Synchronization, stochastic resonance, cell assembly ‘memory traces’ Rest pt 1
Mar 14	Cycle 7 Cycle 8	Rest pt 2 Perturbation by experience (‘top-down’ meets ‘inside out’)
Mar 21	Exam 2	
Mar 28		Theta Group presentations (theta cycle) Gamma Group presentations (attention cycle)
Apr 4		Ripple Group presentations, review (memory cycle)
	Exam 3	Moodle exam

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§ion=general>

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

Wednesday, Jan 11 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.