

## **COURSE SCHEDULE**

### **KINE 3670: Molecular and Cellular Neuroscience with Applications to Health.**

**TEXTBOOK:** Dale Purves, George J Augustine, David Fitzpatrick, Lawrence C Katz, Anthony-Samuel LaMantia, James O McNamara, and S Mark Williams. “Neuroscience” 5<sup>th</sup> Edition..

**COURSE DIRECTOR:** **Dr. Dorota Anna Crawford**  
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Course website: on Moodle

**Teaching Assistant** **Christine Wong**  
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**GRADING:** Midterm exam **40%**  
Final Exam **60%**

Exam relevant material will consist of (i) all the material covered in the lectures and power point slides and (ii) the content of the corresponding chapters from the textbook. Exams will consist of multiple choice questions. It is strongly advised that you attend classes.

If you miss a midterm or final exam for a documented medical or other reason you will be required to write a make-up exam. Proper documentation must be delivered to the course director **NO LATER THAN 1 WEEK FOLLOWING THE EXAM**.

**Do not approach the course director to have your grade increased. THE ANSWER IS NO!! Any grade adjustments will be applied to EVERYONE, no special circumstances will be granted. No “extra assignments” will be available for anyone to write.**

#### **COURSE GOALS:**

The course will help you to gain a deeper understanding of the basic molecular and cellular mechanisms of the brain, and their applications to various disease processes. The course covers topics ranging from neuronal structure and function, communication at the synapse, membrane receptors and intra- and intercellular signaling systems within the sensory, motor and memory systems. The course will also cover the cellular and molecular processes underlying neuronal development, including differentiation of nerve cells, migration of neurons, mechanisms of axonal growth and guidance, target recognition and synapse formation, and the basis of synaptic specificity. Applications to specific disease processes will be described to illustrate the clinical applications of basic neuroscience. This course will provide basic understanding of molecular mechanisms underlying brain dysfunctions that contribute to disorders of the nervous system and rationales for pharmacological treatments.

**COURSE SCHEDULE:**

- Lecture 1** Course Overview
  - Lecture 2** Anatomy of the nervous system, MRI and PET (*Chapter 1 and Appendix*)
  - Lecture 3** Neurons and glia (*Chapter 1*)
  - Lecture 4** Resting membrane potential, Nernst and Goldman equation (*Chapter 2, 4*)
  - Lecture 5** Action potential. Saltatory conduction (*Chapter 3*)
  - Lecture 6** Multiple Sclerosis I – Symptoms Epidemiology Genes (*Lecture Notes*)
  - Lecture 7** Multiple Sclerosis II – Types of MS, stages & symptoms (*Lecture Notes*)
  - Lecture 8** Synaptic transmission I, Electrical and chemical synapses (*Chapter 5*)
  - Lecture 9** Synaptic transmission II, Postsynaptic receptors (*Chapter 5*)
  
  - Lecture 10** **MIDTERM EXAM (Lectures 2-9) – October 11**
  
  - Lecture 11** Neurotransmitters I: ACh, Myasthenia gravis (*Chapter 6*)
  - Lecture 12** Neurotransmitters II: GABA, Glutamate, Serotonine (*Chapter 6*)
  - Lecture 13** Neurotransmitters III: Catecholamines; Neurodegenerative disorders (*Chapter 6*)
  - Lecture 14** Drugs and addiction (selected sections *Chapter 6, 29 and Lecture Notes*)
  - Lecture 15** Molecular Basis of Schizophrenia (*Lecture Notes*)
  - Lecture 16** Learning and memory (*Chapter 8*)
  - Lecture 17** Memory (*Chapter 31*)
  - Lecture 18** Alzheimer’s Disease (*Chapter 31 and Lecture Notes*)
  - Lecture 19** Lipid Mediators as unconventional neurotransmitters (*Lecture Notes*)
  - Lecture 20** Autism Spectrum Disorders (*Lecture Notes*)
  - Lecture 21** Review
- FINAL EXAM (Lectures 11-20) – Exam session (TBA)**

**IMPORTANT DATES**

- Sept 8** Classes Start
- Oct. 27-30** Reading Days
- Dec. 5** Classes end
- Dec. 7-22** Examination Period
- Sept. 21** Last date to add a course **without permission** of instructor
- Oct. 5** Last date to add a course **with permission** of instructor
- Nov. 11** Last date to drop course without receiving a grade

## **IMPORTANT GENERAL COURSE INFORMATION FOR STUDENTS**

### **Academic Honesty and Integrity**

York students are required to maintain high standards of academic integrity and are subject to the Senate Policy on Academic Honesty. There is also an academic integrity website with complete information about academic honesty. Students are expected to review the materials on the Academic Integrity website (<http://www.yorku.ca/academicintegrity>).

### **Access/Disability**

York provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. It is the student's responsibility to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Failure to make these arrangements may jeopardize your opportunity to receive academic accommodations. Additional information is available at [www.yorku.ca/disabilityservices](http://www.yorku.ca/disabilityservices) or from disability service providers:

- *Office for Persons with Disabilities: N108 Ross, 416-736-5140, <http://calendars.registrar.yorku.ca/2008-2009/services/opd.htm>*
- *Learning and Psychiatric Disabilities Programs - Counselling & Development Centre: 130 BSB, 416-736-5297, [www.yorku.ca/cdc](http://www.yorku.ca/cdc)*

### **Religious Observance Accommodation**

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director *within the first three weeks of class*. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately.

Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete an Examination Accommodation Form, which can be obtained from Student Client Services, Student Services Centre or online at [http://www.registrar.yorku.ca/pdf/exam\\_accommodation.pdf](http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf)

### **Student Conduct**

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect and to refrain from actions disruptive to such a relationship. Moreover, it is the responsibility of the instructor to maintain an appropriate atmosphere in the classroom, and the responsibility of the student to cooperate in that endeavor. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. A statement of the policy and procedures involving disruptive and/or harassing behaviour by students in academic situations is available on the York website

<http://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/>