

KINE 4230: Neuronal development for activity and health COURSE SCHEDULE

COURSE DIRECTOR **Dr. Dorota Anna Crawford**
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GRADING **Midterm exam** **45%**
 Final Exam **55%**

TEXTBOOKs **Sanes, Reh and Harris: “*Development of the Nervous System*”**
(Recommended) **Purves “*Neuroscience*” 5th Edition (on reserve at Steacie)**

TIME AND LOCATION **Tuesdays/Thursdays 10:00AM – 11:30PM**
 Tuesdays VH 3009
 Thursdays VH 3006
 Course website available on MOODLE

COURSE DESCRIPTION

This course is intended to discuss the molecular mechanism involved in neuronal and neuromuscular development with an emphasis on physical activity, health and disease. It will focus on molecular and environmental cues that signal and promote differentiation, outgrowth and target-finding, and refinement of synaptic or neuromuscular connections and the acquisition of regional and cellular identity. Specific topics include the basics of cell signaling, neural induction, patterning, mechanisms of axon guidance, cell migration, proliferation and death, target recognition and synapse formation and elimination. Information drawn from these basic developmental mechanisms will be used to discuss the recent advances in our understanding of the pathogenesis of neurological disorders that affect health and physical activity.

IMPORTANT INFORMATION ABOUT THE EXAMS AND QUIZZES:

Exams will be based on the material covered in lectures, power point slides and posted supplementary material for specified lectures. Exams will consist of *Multiple Choice* and *True/False* type questions. It is strongly advised that you attend classes.

IF YOU MISS THE MIDTERM OR FINAL EXAM you are required to notify the course director NO LATER THAN 1 WEEK FOLLOWING THE EXAM.

- Documentation must be provided by a registered clinical psychologist, psychiatrist, or medical doctor indicating that you were indeed unable to attend on the specific date of the exam because of your particular problem
- Notes from counselors or alternative healing providers are not acceptable
- Only the *ATTENDING PHYSICIAN'S FORM* is acceptable – no other written note or letter will be accepted. This form may be downloaded from:
<https://secure.students.yorku.ca/pdf/attending-physicians-statement.pdf>

MISSED MIDTERM: There will only be ONE date available for a MAKE-UP midterm. If you miss the make-up exam your grade will be 0%.

MISSED FINAL: Students who miss the final exam will be allowed to write a deferred make-up exam ONLY ONCE. Further extensions or accommodation will require students to submit a formal petition to the Faculty.

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 SCHEDULE:

MODULE 1:

- Lecture 1 Course overview
- Lecture 2 Brain Development
- Lecture 3 Early development of the Embryo
- Lecture 4 Induction of the neural plate
- Lecture 5 Neuronal Migration
- Lecture 6 Neuronal Differentiation
- Lecture 7 Developmental Genes (Hox genes) and Retinoic acid
- Lecture 8 *Neural Tube Defects*
- Lecture 9 Sonic hedgehog in development; *Smith-Lemli-Opitz Syndrome*
- Lecture 10 Neural crest cell migration

MODULE 2:

- Lecture 11 Axonal pathfinding 1 - Neuronal polarity, axonal and dendritic growth
- Lecture 12 Axonal pathfinding 2 - Axonal outgrowth
- Lecture 13 Synaptogenesis - Synapse rearrangement and Synaptic plasticity
- Lecture 14 Synapses and Myelination
- Lecture 15 Synaptogenesis
- Lecture 16 Critical Period - Experience dependent synaptic plasticity
- Lecture 17 Nature vs. nurture
- Lecture 18 Environmental causes of *Neuronal Defects*
- Lecture 19 Disorders of Early Neuronal Development – *Autism Spectrum Disorders*
- Lecture 20 Research Methods for Studying Brain Development
- Lecture 21 Review

MIDTERM EXAM (Lectures 2-10) – TUESDAY FEBRUARY 28th in class

FINAL EXAM (Lectures 11-20) – During the exam session

IMPORTANT DATES:

- Feb. 18-24 Winter Reading Week
 - April 10 Classes end
 - April 12-27 Examination Period
 - Jan. 22 Last date to add a course **without permission** of instructor
 - Feb. 6 Last date to add a course **with permission** of instructor
 - March 17 Drop deadline: Last date to drop a course without receiving a grade
- Course withdrawal policy: <https://myacademicrecord.students.yorku.ca/course-withdrawal>

IMPORTANT GENERAL COURSE INFORMATION FOR STUDENTS

Useful links describing computing information, resources and help for students:

Student Guide to Moodle	https://lthelp.yorku.ca/student-guide-to-moodle
Computing for Students Website	https://student.computing.yorku.ca/
Student Guide to eLearning at York University	http://elearning-guide.apps01.yorku.ca/
Learning Skills Services	https://lss.info.yorku.ca/online-learning/

SPECIAL ACCOMMODATION

*While all individuals are expected to satisfy the requirements of their program of study and to aspire to achieve excellence, the university recognizes that persons with disabilities may require reasonable accommodation to enable them to perform at their best. The university encourages students with disabilities to register with Student Accessibility Services to discuss their accommodation needs as early as possible in the term to establish the recommended academic accommodations that will be communicated to Course Directors through their Letter of Accommodation (LOA). **Please let me know as early as possible in the term if you anticipate requiring academic accommodation so that we can discuss how to consider your accommodation needs within the context of this course.** Sufficient notice is needed so that reasonable steps for accommodation can be discussed. Accommodations for tests/exams normally require three (3) weeks (21 days) before the scheduled test/exam to arrange.*

ACADEMIC HONESTY AND INTEGRITY

In this course, we strive to maintain academic integrity to the highest extent possible. Please familiarize yourself with the meaning of academic integrity by completing SPARK's Academic Integrity module at the beginning of the course. Breaches of academic integrity range from cheating (i.e., the improper crediting of another's work, the representation of another's ideas as your own, etc.) to aiding and abetting (helping someone else to cheat). All breaches in this course will be reported to the appropriate university authorities, and can be punishable according to the Senate Policy on Academic Honesty (<https://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>).

All students are expected to familiarize themselves with the following information, available on the Senate Committee on Academic Standards, Curriculum & Pedagogy webpage (see Reports, Initiatives, Documents) -

<http://secretariat.info.yorku.ca/files/CourseInformationForStudentsAugust2012.pdf>

- Senate Policy on Academic Honesty and the Academic Integrity Website
- Ethics Review Process for research involving human participants
- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
- Student Conduct Standards
- Religious Observance Accommodation