The University of Western Ontario
Faculty of Health Sciences
School of Kinesiology

Sensorimotor Neuroscience: 9248a

Course Instructor: Dr. Matthew Heath
Email: mheath2@uwo.ca
Class: LWH 2210
Class Time: Tuesday 1:00-3:30 pm

Course Description:

This multidisciplinary course is designed to provide students with advanced understanding of the neurobehavioral foundations of voluntary human movement. Seminar-based lectures and research projects will emphasize how central nervous system structures regulate movement and how acquired (e.g., Alzheimer’s disease, stroke) and congenital disease impairs movement control. This course will also examine intervention strategies that can improve movement control in a variety of clinical populations.

Learning Objectives:

1. To understand the analyses techniques associated with neurobehavioral analyses of human movement.

2. To understand the functional and behavioral correlates of human neuroanatomy.

3. To identify the cortical and subcortical regions subserving voluntary movement.

4. To understand the neuropathological basis of movement disorders (e.g., apraxia, ataxia, Parkinson’s disease).

5. To provide students with an open forum for discussing research questions and presenting research material. Active participation and the development of presentation skills are essential to ensure success in this course.
Recommended Text:

Note: textbooks are not required and in most cases readings will be posted to OWL.


Supplemental Text:


Assistance with Class Material

1. The preferred means for students to get assistance with course material is to ask questions during class. Remember, it is unlikely that you are the only one with the question/problem.
2. A second option is to ask me during office hours. It is also possible to contact me via email; however, bear in mind that I am not always able to respond promptly to email queries.
3. It is the student’s responsibility to obtain ancillary lecture notes/materials when they have missed a class (i.e., students must get this information from a colleague in the class).

Missing Tests/Exams or Assignment Deadlines

Students do miss exams and/or assignment deadlines due to illness or other uncontrollable emergencies. If this happens, the following steps should be taken:

1. Lateness/Absences. Assignments/presentations are due on the assigned due date and will not be accepted late without penalty, except under medical or other compassionate circumstances. A missed presentation or assignment submission without appropriate documentation will result in a grade of zero (0).
2. Attendance is mandatory. Failure to attend a class without a valid explanation (i.e., medical certificate) can result in a 10% loss of grade.

3. Grades. Should you have a concern regarding the grade you received for an assignment/presentation or feel that it is unfair in any way, you must wait 24 hours from the receipt of the assignment to approach the instructor. In doing so, please make an appointment and prepare in writing, with evidence, why you feel your grade is inappropriate.

4. If medical, see a physician on or before the assignment/presentation deadline in question to get the necessary documentation verifying your illness. As specified above, documentation should be provided within the first 48 hours after the test/exam/assignment date or a grade of zero may be recorded.

5. Note: medical exemptions are not automatic (e.g., having a headache on the day an assignment is due may still result in marks deducted or grade of zero if the assignment is handed in late).

6. If you are to miss an assignment/presentation due to a sanctioned university varsity or club team event then you must notify the instructor at least 48 hours in advance of the assignment/presentation official documentation for your team/club event. Failure to provide at least 48 hours advance notification (via email) combined with failure to complete the assignment/presentation will result in a grade of zero. In addition, the student (and not the coach) must contact the course instructor.

**Academic Dishonesty**

*Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a scholastic offence, at the following Web site:*
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf. You must read the document identified in the aforementioned web link. Ignorance of what constitutes plagiarism or other offenses of academic dishonesty may not be used as an excuse in this class. In particular students are required to fully understand the term plagiarism and why protecting against this act represents an important academic process. In this class, any assignment/presentation with an identified breach of academic misconduct (plagiarism, cheating etc.) will be reported to the appropriate Dean or Director’s Office and handled via the university-wide resolution policy (see website above for details).
Course Content:

Course content will surround the research interests of class members. Hence, topics will change on a weekly basis as determined by the class. A potential list of topics is presented in the list below.

Topic #1  Cerebral Cortex  
           i.  Structure and anatomy

Topic #2  Cerebral Cortex  
           i.  Primary motor areas

Topic #3  Cerebral Cortex  
           i.  Associative motor regions (premotor and sensorimotor)

Topic #4  Research Presentations (Motor, premotor, or sensorimotor)

Topic #5  Cerebral Cortex  
           i.  Pathophysiology. Diseases of motor, premotor and sensorimotor regions

Topic #6  Research Presentations (Cerebral cortex pathophysiology)

Topic #7  Basal Ganglia  
           i.  Anatomy and structure  
           ii.  Input-output connections of the basal ganglia

Topic #8  Basal Ganglia  
           iii.  Pathophysiology: Diseases of the basal ganglia  
           iv.  Basal ganglia models

Topic #9  Research Presentations (Basal ganglia)

Topic #10  Cerebellum  
           i.  Cerebellar anatomy  
           ii.  Circuitry of the cerebellar cortex

Topic #11  Cerebellum  
           iii.  Pathophysiology: Diseases of the cerebellar cortex  
           iv.  Adaptation and learning  
           v.  Theories of cerebellar function

Topic #12  Research Presentations (Cerebellum)

Topic #13  Neural correlates of motor skill acquisition
i. Neuro-imaging evidence
ii. Functional adaptations of cortical and subcortical structures
iii. Motor learning pathology

Topic #14  
Research Presentations (Neural correlates of motor learning)

Student Evaluation:

Class Participation 30%
Research Presentations (three research presentations must be completed during the course of the semester) 40%
Research Paper 30%

Note: students may decide to complete a research project to encompass their evaluation. This may be selected in consultation with the instructor.

Grading:

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<th>Grade</th>
<th>Minimum Score</th>
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English Proficiency for the Assignment of Grades:
Visit the website: [http://www.uwo.ca/univsec/pdf/academic_policies/exam/english.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/exam/english.pdf)

Support Services:
There are various support services around campus and these include, but are not limited to:

1. Student Development Centre -- [http://www.sdc.uwo.ca/ssd/](http://www.sdc.uwo.ca/ssd/)