KIN 9466 – Neuroscience of Human Movement
Fall 2019

Instructors

Dr. Matthew Heath
Office: AHB 3G10
Email: mheath2@uwo.ca
Office Hours: Monday, 1:30-2:30 or by appointment

Dr. Anita Christie
Office: AHB 3G16
Email: achriss95@uwo.ca
Office Hours: By appointment

Dr. Charles Rice
Office: HSB 411B
Email: crice@uwo.ca
Office Hours: By appointment

Calendar Course Description (including prerequisites/anti-requisites):

A multidisciplinary course designed to provide an advanced understanding of the cortical and spinal mechanisms supporting human movement. This course will consider movement control in health and disease states and how active lifestyles promote the health of the central nervous system.

Format

The course meets weekly (Wednesdays 12:30 to 3:30) for a 3-hour lecture and/or seminar style class (room 3B02 AHB). At each class students are expected to be prepared (i.e., complete assigned readings) and actively participate in discussion.

Learning Outcomes/Schedule:

- Understand the cortical structures that contribute to the control of goal-directed actions.
- Understand the motor output from the spinal cord to skeletal muscles and how the anatomical organization (motor units) control voluntary contractions in various tasks and conditions.
- Explain the cortical and spinal contributions to the control of motor units.
- Compare, contrast, and critically evaluate the evidence supporting/refuting the role of sensory feedback in movement and fatigue.
- Demonstrate independent critical thinking and effective and efficient oral and written communication skills.

Evaluation, Format and Style:

Dr. Heath:
Weeks 1 – 3: 25% of final grade (10% Oral Presentation, 10% Written Summary; 5% Participation)

Oral Presentation: Students will participate in a 30-min oral presentation completed in a group of three to four members. The oral presentation will outline a cortical structure/network (i.e., posterior parietal cortex) that contributes to the control of a specific movement (i.e., grasping) (see details below). Each student will complete one oral presentation during this period. The date of each student presentation will be determined at the first class of the semester. Failure to complete a group presentation on the assigned date without a valid medical or compassionate accommodation will result in a grade of zero.

Written Summary: Each student will write an independent summary of their group presentation. The summary will provide an efficient and effective precis of the student’s group presentation. The format of the write-up will entail double-spacing with margins set at one-inch and will include Times New Roman 12 point font and will be double-sided and printed on a single-sheet of paper (i.e., front and back). Written summaries will be graded for the effectiveness and efficiency of writing (50% of grade) and for demonstrating competence in the topic area (50% of grade).
will be submitted to the instructor at the beginning of class on September 25, 2019. Failure to submit a written summary at this time without a valid medical or compassionate accommodation will result in a grade of zero.

**Participation:** Students will actively engage in classroom discussion. The basis for the classroom discussion will surround the group presentation and an assigned reading associated with each presentation or general discussion of presented material.

**Dr. Rice:**

*Weeks 4-7 no class week 6: 25% of final grade (20% Scientific Abstract & lay summary, 5% Participation)*

Week 4 - Fundamental structure and function of motor units  
Week 5 - Motor units in different short and long term adaptations (fatigue, training, aging, clinical etc).  
**Week 6 – No class**  
Week 7 - Techniques for studying motor unit structure and function: strengths and limitations

**Participation:** Students will actively engage in classroom discussion. The basis for the classroom discussion will surround assigned readings, and general discussion of class material.

**Dr. Christie:**

*Weeks 8 – 13: 50% of final grade (25% Paper, 20% Presentation, 5% Participation)*

**Tentative Schedule:**

Week 8 – Cortical control of motor units  
Week 9 – Reading week  
Week 10 – Reflex control of motor units  
Week 11 – Sensory feedback Ia/ group III/IV  
Week 12 – Sensory feedback in fatigue development  
Week 13 – Presentations

**Paper:** Students will write a proposal for a research project aimed at answering a question related to the neuroscience of human movement. Students will select the topic and submit it for approval by Dr. Christie by **November 13th at 12:30pm**. A 5-page (excluding references), double-spaced paper outlining the proposal will be submitted through OWL by **December 11th at 5:00pm**. The paper will include background information supporting the proposal, a statement of the aim(s) and hypothesis(es), a description of the methods, and a description of the expected outcomes, and a list of references. A minimum of 5 primary, peer-reviewed research articles must be included. Further instructions and grading rubric will be provided on OWL.

**Presentation:** Students will provide a 5-minute presentation of their proposal, using the information outlined in the paper. Each student will complete an individual presentation including background information supporting the proposal, a statement of the aim(s) and hypothesis(es), a description of the methods, and a description of the expected outcomes. Each presentation will be evaluated by 2-5 of your peers and your final mark will be a combination of the peer evaluations and Dr. Christie’s evaluation. Further instructions and grading rubric will be provided on OWL.

**Participation:** Students will actively engage in classroom discussion. The basis for the classroom discussion will surround assigned readings, and general discussion of class material. Students will be required to complete a brief reading assignment, due at the start of class, for required readings posted on OWL. Completion of reading assignments will count toward your participation grade.

**Participation for all sections:** Students will actively engage in classroom discussion. The basis for the classroom discussion will surround assigned readings, and general discussion of class material and presentations.
Course/University Policies

1. **Academic offences:**
   They 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

   A) Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar). All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between Western University and Turnitin.com http://www.turnitin.com

2. **Health and Wellness:**
   Information regarding health and wellness-related services available to students may be found at http://www.health.uwo.ca/.

   Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/) for a complete list of options about how to obtain help.

3. **Support Services**
   There are various support services around campus and these include, but are not limited to:
   - Student Development Centre -- http://www.sdc.uwo.ca/ssd/
   - Student Health & Wellness -- http://www.health.uwo.ca/
   - Registrar's Office -- http://www.registrar.uwo.ca/
   - Ombudsperson Office -- http://www.uwo.ca/ombs/

4. **Student Code of Conduct**
   The purpose of the Code of Student Conduct is to define the general standard of conduct expected of students registered at Western University, provide examples of behaviour that constitutes a breach of this standard of conduct, provide examples of sanctions that may be imposed and set out the disciplinary procedures that the University will follow. For more information, visit https://www.uwo.ca/univsec/pdf/board/code.pdf

5. **Electronic Device Usage:**
   **During Lectures and Tutorials:** Although you are welcome to use a computer during lectures and tutorial periods, you are expected to use the computer for scholastic purposes only, and refrain from engaging in any activities that may distract other students from learning. Please be respectful to your fellow students and turn the sound off. If the professor receives complaints from other students regarding noise or other disruptive behavior (e.g. watching videos on YouTube.com, updating your Facebook status, playing Solitaire), your classroom privileges will be revoked. From time to time, your professor may ask the class to turn off all computers, to facilitate learning or discussion of the material presented in a particular class. Unless explicitly noted otherwise, you may not make audio or video recordings of lectures – nor may you edit, re-use, distribute, or re-broadcast any of the material posted to the course website.
Weeks 1 – 3: Oral Presentation (Dr. Heath’s section)

Oral presentations will be completed within a group of 3 to 4 members. The presentation will cover a pertinent or emerging area specific to a cortical structure or network mediating purposeful human movement. For example, you can select the posterior parietal cortex role in integrating visual information to supporting an ongoing upper- or lower-limb movement. The rubric for the oral presentation is provided below.

Scale: 1- missing  2 – needs work  3-satisfactory  4-good  5-excellent

Organization
1. **Introduction**
   Presenter explains topic and subject of thesis clearly. [ ]

2. **Body**
   Body points are simple, clear, and logically support the focus of the presentation. [ ]

3. **Transitions and sequencers**
   Transitions and sequencers are used to bridge major points (i.e., from one topic to another) and minor points in the presentation. [ ]

4. **Visual Aids**
   Visual aids clearly relate to and support the major points of the presentation. [ ]

5. **Conclusions**
   Presenter provides a concise summary of the major components/ramifications associated with their presentation. [ ]

Delivery
1. **Speaking level**
   Speaking level is loud and confident enough for the audience. [ ]

2. **Pacing**
   Speaking style is natural, calm, and clear. Presenter **ensures** the audience that they understand each point. [ ]

3. **Eye Contact**
   Presenter maintains continuous eye contact with the audience. [ ]

4. **Gestures**
   Presenter uses gestures to highlight major points. [ ]

Content
1. **Well researched**
   Presenter provides clear evidence of evaluation of extant research. [ ]

2. **Expertise**
   Presenter demonstrates developing expertise in topic area. [ ]

3. **Questions**
   Presenter readily able to address audience-based questions. [ ]

General Comments
1. **Overall strength(s) of this presentation.**

2. **Overall weakness/weaknesses of this presentation.**

3. **What could be done to significantly improve this presentation?**