Western University Faculty of Health Sciences
School of Kinesiology

KIN 9466B (Special topics Bioscience 002) – Neuromuscular Physiology
Winter 2022

Instructors

Dr. Charles Rice  Dr. Anita Christie
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Office Hours: By appointment  By appointment

Calendar Course Description:
A multidisciplinary course designed to provide an advanced understanding of the cortical and spinal mechanisms contributing to human movement and the feedback control mechanisms that support its sustainability. 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 in person (Wednesdays 1:30-4:30) for a 3-hour lecture and/or seminar style class. At each class students are expected to be prepared (i.e., complete assigned readings and pre-lecture assignments) and actively participate in discussion.

Learning Outcomes:
- Explain 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.
- Compare, contrast, and critically evaluate the evidence of the role of the nervous system in the control of movement.
- Demonstrate independent critical thinking
- Demonstrate effective and efficient oral and written communication skills.

Schedule:

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<tr>
<th>Week of</th>
<th>Lecture Topic</th>
<th>Instructor</th>
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<tbody>
<tr>
<td>Jan 3</td>
<td>Structure and function of motor units</td>
<td>Rice</td>
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<td>Jan 9</td>
<td>Motor units in short-term adaptations</td>
<td>Rice</td>
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<tr>
<td>Jan 17</td>
<td>Motor units in long-term adaptations</td>
<td>Rice</td>
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<tr>
<td>Jan 24</td>
<td>Motor units in disease states</td>
<td>Rice</td>
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<tr>
<td>Jan 31</td>
<td>Techniques for studying motor units structure and function</td>
<td>Rice</td>
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<td>Feb 7</td>
<td>Interpretation of electromyographic signals</td>
<td>Christie</td>
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<tr>
<td>Feb 14</td>
<td>Cortical control of motor units</td>
<td>Christie</td>
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<tr>
<td>Feb 21</td>
<td>READING WEEK</td>
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<td>Feb 28</td>
<td>Reflex control of motor units</td>
<td>Christie</td>
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<td>March 7</td>
<td>Sensory feedback</td>
<td>Christie</td>
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<tr>
<td>March 14</td>
<td>Sensory feedback in fatigue development</td>
<td>Christie</td>
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<tr>
<td>March 21</td>
<td>Oral Presentations</td>
<td>Christie/Rice</td>
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<tr>
<td>March 28</td>
<td>Oral Presentations</td>
<td>Christie/Rice</td>
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Evaluation, Format and Style:

1. **Participation (10%)** – 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 for readings posted on OWL. Completion of reading assignments will count toward your participation grade and they will be due at 5 pm on the day before each class *(with the exception of Lecture 1)*.

2. **Scientific Abstract and Summary Assignment (30%)** - A research paper, without an abstract, will be assigned to the class by week 2. From independent reading of the paper, each student will create an appropriate, comprehensive, and comprehensible scientific abstract of no more than 250 words double-spaced (penalty for extra words). On a second separate page each student also will write a lay summary of the paper of no more than 100 words. Finally, students will provide a brief 2-page scientific and academic critique of the study. This assignment will be submitted to Dr. Rice, and further details will be explained in class and posted on OWL. **Due date: February 7th**

3. **Research Proposal Assignment (35%)** - 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. A 5-page (excluding references), double-spaced paper outlining the proposal will be submitted through OWL. 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. **Due date: April 8th**

4. **Oral Presentation (25%)** - Students will provide a 5-7 minute presentation of their research proposal assignment, 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 by Dr. Christie and Dr. Rice. Further instructions and grading rubric will be provided on OWL. **Presentations dates: Weeks of March 21 and March 28.**

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**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](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](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/](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/ombuds/

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.