DEPARTMENT OF KINESIOLOGY
KINESIOL 3E03 / Life Science 3K03: Neural Control of Human Movement
Course Outline for Winter 2016

INSTRUCTOR:
Dr. Michael Vesia, PhD
E-Mail: vesiam2@mcmaster.ca (or through Avenue)
Office Hours: By Appointment Only

SCHEDULE:
Lectures: Thursday Evenings 19:00-22:00
Location: BSB 147 (Burke Science Building)

DESCRIPTION:
This course examines the scientific study of human movement by exploring the relationships between brain and motor behavior. Upon completion of this course, students should have a fundamental understanding of how the structures of the central and peripheral nervous system control movement. In addition, students should have an understanding of the current state of knowledge and an appreciation for a number of contemporary issues in motor control. Specifically, students should be able to describe:
a) the basic components of the human nervous system; b) the key processes involved in the passage of information between neurons; c) how the nervous system controls muscles and monitors body and limb positions; d) how the brain utilizes visual information to control skilled movement; e) how various structures of the brain control human movement; f) cognitive/computational perspectives in motor control of movement; g) various movement pathologies; and h) current strategies and therapies used to restore function after disease and injury.

OBJECTIVES:
As part of the learning objectives of this course, students will be expected:
1. To provide a neurophysiological framework for the scientific study of human motor control.
2. To apply this fundamental knowledge towards the study of specific motor behaviours such as coordination in saccades, reaching, grasping, etc.
3. To be exposed to the latest developments in the field of human motor control neuroscience.
4. To explain and demonstrate how the scientific method can be used to answer questions about motor control.
5. To discuss the rationale behind research methods used in motor control and the links between theory and experiment.
6. To facilitate active learning, critical thinking, and problem solving skills in the analysis of human motor control.

COURSE STRUCTURE & REQUIRED READINGS:

Lectures will focus upon concepts, principles, and research in human motor control and will complement the assigned readings. Students are responsible for all assigned readings and material covered in the lectures. The readings contain material that will not be covered in class. **Students are responsible for this material and it will appear on exams.** In addition, material will be covered in the lectures that will not appear in the readings. **Students are also responsible for this material and it will appear on exams.**

**Textbook:** There is no required textbook.

**Lecture slides** and **assigned readings** will be available for download as Adobe PDF files from the course website (and **updated weekly**). You will be responsible for checking for these weekly postings. Further reading materials (i.e., journal articles) may be assigned in the course of the semester. You also will be responsible for downloading these from the McMaster Library website. Students are expected to take all necessary steps to find out about changes, including but not limited to class attendance, checking McMaster emails, and check online course management sites. Students are expected to consult course website frequently for updates, changes, lecture materials and class discussions. Lecture slides will typically *(but not always)* be available before the class.

**EVALUATION:**

**Examinations:**

There will be **three midterm examinations.**

| Midterm Exam 1 | 30% | Thursday, January 28, 2016 |
| Midterm Exam 2 | 35% | Thursday, March 3, 2016 |
| Midterm Exam 2 | 35% | Thursday, March 31, 2016 |

Exam locations will be announced in due course.
Midterm exams will consist of multiple-choice and short/long answer questions.

Material to be examined in Midterm exam #1 will include lectures from the beginning of term, plus required readings as assigned.

Material to be examined in Midterm exam #2 will include lectures since the previous midterm, plus required readings as assigned.

Material to be examined in Midterm exam #3 will include lectures since the previous midterm, plus required readings as assigned.

TEACHING ASSISTANTS: TBA

Each student will have a specific contact TA assigned based on your last name and student number. Your TA will be your first line of contact for you for all course related concerns, reviewing exam related queries. The TAs will maintain regular contact hours during which time you may contact them regarding any course related concern.

All graded work will be available for viewing and discussion through the TA assigned to each student. You should contact designated TA to make individual arrangements for viewing marked exams and/or seek clarification about your mark. The email addresses for the TAs will be made available to you in the second week of class. You may also contact them through the avenue website.

POLICY REGARDING DEFERRED TESTS AND EXAMS:

Students who miss the term test or final exam for legitimate reasons such as illness may be allowed to write a deferred or "make-up" test. In all instances, appropriate documentation must be submitted to the Office of the Associate Dean, Faculty of Science.

Note: it is the student's responsibility to initiate accommodation arrangements for missed work. Failure to do so will result in a grade of zero for the missed work.

University policy provides provision for possible accommodation for missed work worth less than 25% of your final grade, for absences (minor medical reasons lasting fewer than 5 days), using the McMaster Student Absence Form (msaf). Please note that all in-term tests in this course are valued at 30-35% of your final grade and, as such, accommodation for rewriting these tests will not be granted through the msaf process.

Students who miss these tests for legitimate reasons such as illness may be still allowed to write a deferred or "make-up" test if appropriate documentation is submitted to the Office of the Associate Dean, Faculty of Science. In situations where the Office of
the Associate Dean deems sufficient merit in the request, the course instructor will make alternative arrangements regarding test deferral. The instructor will determine time and location of DEFERRED MIDTERMS. Please note that in order to maintain the greatest degree of fairness, these alternative times will be within two school days of the originally scheduled test. If circumstances do not allow for the make-up test to be written during this time frame, a final opportunity to write any missing tests will be held on Thursday, April 7 from 7:00-10:00 pm.

Students who miss a Registrar-scheduled final exam can apply to the Associate Dean’s office for permission to write in the deferred final exam schedule. In all cases, appropriate documentation must be submitted to the Office of the Associate Dean, Faculty of Science, for consideration of deferred examination permission. Under no circumstances will the instructor re-schedule a final exam for individual students.

ACADEMIC INTEGRITY:

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences (e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript reading "Grade of F assigned for academic dishonesty", and/or suspension or expulsion from the university). It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, specifically Appendix 3, located at: http://www.mcmaster.ca/univsec/policy/AcademicIntegrity.pdf

The following illustrates only three forms of academic dishonesty:
• Plagiarism (e.g. the submission of work that is not one’s own or for which other credit has been obtained),
• Improper collaboration in-group work.
• Copying or using unauthorized aids in tests and examinations.

ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone (905) 525-9140 ext. 28652 or email sas@mcmaster.ca.

ON-LINE LEARNING RESOURCES (if applicable):

Students should be aware that, when they access the electronic components of this course, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in this course will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure please discuss this with the course instructor.

MODIFICATIONS TO COURSE

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes. Note details, updates, and/or changes to the course outline will be announced in class and/or posted on Avenue to Learn.

MISSED STUDENT ABSENT FORM:

If you are absent from the university for a minor medical reason, lasting fewer than 5 days, you may report your absence, without documentation, using the McMaster Student Absence Form. Absences for a longer duration or for other reasons (i.e., Religious, personal) must be reported to your Faculty/Program office, with documentation, and relief from term work may not necessarily be granted. When using the MSAF, report your absence to vesiam2@mcmaster.ca. Then contact the instructor/lab TA immediately (normally within 2 working days) by email/telephone/in person to learn what relief may be granted for the work you have missed, and relevant details such as revised deadlines, or time and location of a make-up exam.

TOPICS TO BE COVERED:

Content schedule:

Course content details will be available on the avenue web site and updated on a regular basis. All lecture material will be supplemented with video demonstrations of movement pathologies. The tentative lecture schedule is listed below (this is subject to change in the course of the semester).
## Lecture Schedule (**Tentative**)  

<table>
<thead>
<tr>
<th>Date</th>
<th>General Topic</th>
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<tbody>
<tr>
<td>Jan. 7</td>
<td>Introduction to Motor Control &amp; Basic Neuroimaging Techniques</td>
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<tr>
<td>Jan. 14</td>
<td>Introduction to Nervous System and Movement</td>
</tr>
<tr>
<td>Jan. 21</td>
<td>Sensory-Motor System 1: Control of Muscle; Sensory-Motor System 2: Proprioception</td>
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<td>Jan. 28</td>
<td><strong>Midterm EXAM #1 (30%)</strong></td>
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<tr>
<td>Feb. 4</td>
<td>Sensory-Motor System 3: Visual Control of Movement; Evidence for Two Visual Streams</td>
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<td>Feb. 11</td>
<td>Saccades. Reaching, Grasping &amp; Parietal Cortex</td>
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<td>Feb. 18</td>
<td><strong>READING WEEK: No Classes</strong></td>
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<tr>
<td>Feb. 25</td>
<td>Sensory-Motor System 4: Brain Control of Movement</td>
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<td>March 3</td>
<td><strong>Midterm EXAM #2 (35%)</strong></td>
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<tr>
<td>March 10</td>
<td>Basal Ganglia; Movement Pathologies: stroke, subcortical structures</td>
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<td>March 17</td>
<td>Cerebellum; Efference Copy</td>
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<td>March 24</td>
<td>Neural Rehabilitation Strategies &amp; Plasticity</td>
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<tr>
<td>March 31</td>
<td><strong>Midterm EXAM #3 (35%)</strong></td>
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<tr>
<td>April 7</td>
<td><strong>All Deferred EXAMS</strong></td>
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**FEEDBACK**

It really helps us improve our services when we hear from our students, faculty and staff about what we can do better. A feedback process brings to our attention situations in which we may not have adequately considered accessibility and allows us to better plan for accessibility in the future.
OTHER ISSUES

· Full attendance is expected at all lectures.

· Students, whose attendance or performance is severely affected by medical, emotional or other disabilities, should consult with the instructor early in the term to discuss special arrangements. Supporting documentation must be provided.

· Please let us know in advance, preferably in the first week of class, if there are any special learning requests or requirements.

· Students who plan to be absent for varsity athletics, family obligations or other similar commitments should discuss these commitments with the instructor before the withdrawal date.

· All notes posted on Avenue to Learn are the intellectual property of the instructor and are not to be redistributed without permission.

· Should you wish to record a lecture (in any format, whether audio or audio-visual) you must seek written permission of the instructor before the lecture begins and you will need to explain the reason for wishing to record the lecture. Note that any such recording will be permitted only for the purposes of private study for the individual student. Students may not distribute, email, electronically post, or otherwise communicate these materials to any other person.