

Department of Kinesiology and Physical Education  
McGill University

**EDKP 447: Motor Control (3 credits)**  
**Fall 2019**

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**Lectures (13 weeks)**

Tuesdays & Thursdays 4:05 PM-5:25 PM  
**Currie 305/6**

**Prerequisites:** EDKP 206 Biomechanics of Human Movement  
PHGY 201 or PHGY 209 Mammalian Physiology 1  
PHGY 202 or PHGY 210 Mammalian Physiology 2  
EDKP 261 Motor Development

<b>Weekly Time Commitment:</b>	Classes	<b>3 hours</b>
	Study Time	<b>5 hours</b>
	<u>Term Project</u>	<u><b>1 hour</b></u>
	<b>Total</b>	<b>9 hours</b>

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**1. Course Description**

This course aims to introduce the field of motor control. It will provide information concerning how information is processed, the types of sensory information used in motor control and simple models of control processes. It will give a detailed explanation of how posture and movement are maintained in humans, the neural basis of motor control and outline current theories behind how humans learn complex movements. Several diseases of the nervous system will be presented in terms of their pathophysiology and motor control signs and symptoms.

**2. Learning Outcomes**

At the end of this course, students will be able to:

- Explain how various structures of the brain control human movement.
- Summarize how different factors influence information processing and motor preparation.

- Summarize the processes underlying the preparation and regulation of movement.
- Explain feedforward and feedback processes in the control of movement.
- Describe how the brain utilizes visual information to control skilled movement.
- Explain the dynamical systems principles that are involved in movement coordination.
- Explain how diseases of the nervous system affect the control of movement.

### 3. Course Content

Calendar (subject to minor changes)

wk	date	Tuesday	date	Thursday
1	9/3	Introduction to Motor Control	9/5	Refresher: basic characteristics of the nervous and muscular systems
2	9/10	Information Processing	9/12	Tutorial 1
3	9/17	Sensory Contributions	9/19	Scalar training + <b>Group topic assignment</b>
4	9/24	Control Loops & Motor Programs	9/26	Motor Programs
5	10/1	Review + Tutorial 2	10/3	<b>EXAM 1</b>
6	10/8	Descending/Ascending Pathways	10/10	Tutorial 3 + Scalar session
7	10/15	Tutorial 4 <b>first part + outline</b>	10/17	Motor Learning
8	10/22	Tutorial 5	10/24	Posture
9	10/29	Posture	10/31	Tutorial 6 - Review Session
10	11/05	<b>EXAM 2</b>	11/7	Orals
11	11/12	Orals	11/14	Orals
12	11/19	Orals	11/21	Orals
13	11/26	Orals	11/28	Supplemental Oral (if needed) <b>DUE Term Project</b>   Quiz

### 4. Instructional methods

Lectures based on assigned readings (posted on MyCourses). Students are advised to read the material **prior** to class. The lectures are designed to help put concepts together and clarify aspects of the reading and NOT to be taken as course material on its own. Students are responsible for their own note taking during lectures.

Tutorials will be smaller group sessions to review course content and solve problems related to class material.

Notes and supporting material (where applicable) will be posted on MyCourses.

5. **Course materials**  
Required readings: Posted on MyCourses.

6. **Student Assignment and Evaluation**

Exam 1	25%
Exam 2	25%
Oral Presentation	10%
Quiz on Oral Presentations	5%
Term Project	35%
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<b>Total</b>	<b>100%</b>

**Exams:**

The midterm exams (2) will evaluate your knowledge of the material covered during the course.

**Term Project:**

For the term project, you will write an information booklet for practicing kinesiologists, informing them of disease-specific motor impairment and provide evidence- or theory-based training. Your booklet will be online and interactive using the Scalar application. Marcela Isuster, librarian, will come during class to show you how to use this application on **September 19, 2019**.

The term project will be a group project. You will work in groups of about four. Topics will be assigned randomly. Topics will target a disease/condition of the nervous system leading to a motor impairment. The project will consist of a description of the disease/condition, and description of the motor impairment(s) followed by a description of the therapeutic techniques currently employed to minimize the impact on or improve motor function, and suggestions for how current techniques could be improved (evidence-based or theory-based).

You will submit the first section of your project on the description of the disease/condition and selected motor impairment along with a detailed outline of the remaining sections of your project on **October 15, 2019**. You will receive detailed feedback that you can apply to your full paper.

The hard deadline to submit your paper is **November 28, 2019**.

The soft deadline to submit your paper is 1 week prior to your scheduled oral presentation. Should you choose to submit your full paper then, comments will be provided prior to the oral presentation so that they can be incorporated to your presentation and final submission. An improved version of the project can be resubmitted on November 28, 2019 hard deadline for regrading. Papers will be reassessed for improvements based on feedback received.

### **Oral Presentation:**

Group presentation of the assigned case (15 minutes). A quiz consisting of questions pertaining to the oral presentations will be given on **November 28, 2019**.

#### **7. Right to write in English or in French**

*"In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded."*

#### **8. Consequences of not completing assignments as requested**

An individual who does not complete a required assignment and does not have a university recognized reason for deferral would receive a zero (0) in that portion of the evaluation. Assignments submitted late will receive a penalty of 10% per day late, including weekends.

#### **9. Use of McGill Email Address**

We will only communicate with students on their official email address. No response will be provided on non-McGill email addresses.

#### **10. Academic integrity**

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see <http://www.mcgill.ca/integrity> for more information).

L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site <http://www.mcgill.ca/integrity>).

I encourage you to visit the above mentioned websites as soon as possible to insure that you are aware of the definitions of cheating, plagiarism and other academic offences that are used by McGill. Simply taking this initiative may help you avoid accidental and unfortunate situations.

Also, I encourage you to visit the following website for precious help on how to refer to internet resources in your assignments, and especially, how to critically evaluate the scientific value of what you read on the internet: <http://www.mcgill.ca/library/library-findinfo/internet/>