

**Department of Kinesiology and Physical Education
McGill University**

**EDKP 447: Motor Control (3 credits)
Fall 2018**

Coordinator: Caroline Paquette, PhD
Office: room 224, Currie Gymnasium
Phone number: (514) 398-4184 x00890
E-mail: caroline.paquette@mcgill.ca
Office hours: Tuesdays & Thursdays after class (4-6 PM)
or by appointment

Teaching Assistant: Alexandra Potvin-Desrochers
Office hours: By appointment alexandra.potvin-desrochers@mail.mcgill.ca

Lectures (13 weeks)
Tuesdays & Thursdays 2:35 PM-3:55 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

Weekly Time Commitment:	Classes	3 hours
	Study Time	5 hours
	Term Project	1 hour
	Total	9 hours

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	9/4	Introduction to Motor Control	9/6	Levels of CNS control of movement
2	9/11	Information Processing	9/13	Tutorial 1 + <i>Group topic assignment</i>
3	9/18	Sensory Contributions	9/20	Tutorial 2
4	9/25	Control Loops & Motor Programs	9/27	Motor Programs
5	10/2	Review	10/4	EXAM 1
6	10/9	Tutorial 3	10/11	Descending/Ascending Pathways
7	10/16	Tutorial 4	10/18	Motor Learning
8	10/23	Tutorial 5	10/25	Posture
9	10/30	Posture <i>DUE Term Project</i>	11/01	Tutorial 6 - Review Session
10	11/06	EXAM 2	11/8	Orals
11	11/13	Orals	11/15	Orals
12	11/20	Orals	11/22	Orals
13	11/27	Orals	11/29	Supplemental Oral (<i>if need be</i>) <i>DUE Term Project - resubmission</i>

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%
Participation/Attendance at Oral Presentations	5%
Term Project	35%
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	Total 100%

Exams:

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

Term Project:

The term project will be a group project. You will work in groups of about five. 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 not).

The paper will be submitted on October 30, 2018. Comments will be provided prior to the oral presentation so that students can incorporate comments in their presentation. An improved version of the project can be resubmitted on November 29, 2018 for regrading. Papers will be reassessed for improvements based on feedback received.

Oral Presentation:

Group presentation of the assigned case (~30 minutes).

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. 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/>