

Department of Kinesiology and Physical Education
McGill University

EDKP 447: Motor Control (3 credits)
Fall 2023

Coordinator: Caroline Paquette, PhD
Office: room 224, Currie Gymnasium
Phone number: (514) 398-2932
E-mail: caroline.paquette@mcgill.ca
Office hours: By appointment

Teaching Assistants:
Office hours: By appointment

Bella Sierra
isabella.sierra@mail.mcgill.ca

Henri Lajeunesse
henri.lajeunesse@mail.mcgill.ca

Lectures (13 weeks)

Mondays & Wednesdays 2:35 PM-3:55 PM

Arts 150

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	Monday	date	Wednesday
1			8/30	Introduction to Motor Control + Refresher: basic characteristics of the nervous and muscular systems
2	9/4	Labor Day	9/6	Information Processing
3	9/11	Sensory Contributions	9/13	Presentation of Term Paper Project <i>Groups finalized => Assign topics</i>
4	9/18	Tutorial Goodale	9/20	Control Loops & Motor Programs <i>Outline Due</i>
5	9/25	Tutorial Earhart	9/27	Motor Programs
6	10/2	Review/Sample Questions	10/4	EXAM 1 6:35PM to 9:25PM Arts 150
7	10/9	Reading week	<i>Paper Due (10/15)</i>	
8	10/16	Peer Review	10/18	Descending/Ascending Pathways
9	10/23	Tutorial Barbeau & Rossignol	10/25	Motor Learning
10	10/30	Tutorial Capaday & Stein <i>Peer Review Due</i>	11/1	Posture
11	11/6	Tutorial Lajoie	11/8	Review/Sample Questions
12	11/13	EXAM 2 6:35PM to 9:25PM Arts 215	11/15	Orals
13	11/20	Orals	11/22	Orals
14	11/27	Orals	11/29	Orals
			11/30 Thursday	Orals
15	12/4	Orals (makeup) <i>Final Paper Due</i>		

4. Instructional methods

Lectures/discussions 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		30%
Term Project		
Outline	5%	} →
Peer review	5%	
Final submission	20%	
Oral Presentation	10%	
Reflection on Oral Presentations	5%	
Total		
<hr/>		Total 100%

Exams:

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

Term Project:

For the term project, you will create documentation for practicing kinesiologists, informing them of disease-specific motor impairment (ie, motor control) and provide evidence- or theory-based training.

The term project will be a group project. You will work in groups of ~ 5 students. 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 on course content).

You will submit a project outline comprised of an annotated bibliography, due **September 20, 2023**. The full draft of your project is to be submitted on **October 15,**

2023. You will receive detailed feedback from a peer-review assessment of your work that you can use to improve your final paper due **December 4, 2023.**

Oral Presentation:

Group presentation of the assigned case. Your presentation will need to be ready for **November 15, 2023.** Except for your own presentation, a reflection for each Oral Presentation will be completed on the MyCourses platform.

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. This does not apply to courses in which acquiring proficiency in a language is one of the objectives.” (Approved by Senate on 21 January 2009)

8. 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](#)” (Approved by Senate on 16 January 2019) (See [McGill’s guide to academic honesty](#) 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](#) (Approuvé par le Sénat le 16 janvier 2019) (pour de plus amples renseignements, veuillez consulter le [guide pour l’honnêteté académique de McGill](#). »

I encourage you to visit the above-mentioned websites as soon as possible to ensure 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.

The work submitted in the context of this class is expected to be your own. The use of technologies such as ChatGPT are prohibited and will be considered a violation of the Code of Student Conduct.

9. 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.

10. 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.

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.

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