

Department of Kinesiology and Physical Education
McGill University

EDKP 208: Biomechanics and Motor Learning (3 credits) Winter 2024

Coordinator: Marcos Rodrigues, PT, MSc

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Lectures (13 weeks)

Tuesdays and Thursdays 13:05 – 14:25 **EDUC627**

Tutorials (13 weeks)

Tuesdays 14:35 – 15:25 **Currie 304**

Prerequisites: EDKP 293 Anatomy & Physiology

Restrictions: Not open to those who have taken or are taking EDKP 206

Weekly Time Commitment:	Classes	3 hours
	Study Time & Reports	5 hours
	Oral	1 hour
	Total	9 hours

1. Course Description

This course is designed to provide physical and health education students with basic, qualitative, and theoretical knowledge of biomechanics and motor learning. Applicable strategies to integrate and implement this knowledge to improve teaching and coaching skills in sport, dance and physical activity will be addressed.

2. Learning Outcomes

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

1. Summarize the basic principles, applications and theoretical concepts in biomechanics and the acquisition of motor learning.
2. Teach and apply these concepts in education and sports situations.
 - a. Teach biomechanics/motor learning principles.
 - b. Analyze a sport skill qualitatively and apply motor learning principles to improve performance.

3. Instructional methods

Lectures: PowerPoint presentations available through MyCourses. The readings are assigned to each class.

Tutorials: Additional weekly hour with U3 students who were in EDKP-208 last year. These sessions are designed as a refresher for the concepts required (mainly math) to be successful in this course. Help with solving biomechanics problems or pointers on various aspects of the course are provided during these periods.

Laboratories: To help with an understanding of the class concepts. Learn how to work with spreadsheets and prepare reports (see dates in table below)

1. Prism/mirror drawing
2. Fitt's Law
3. Torque
4. Cup stacking
5. Guidance

Commented [MR1]: We need to work these dates

4. Required course materials

McGinnis, P.M. (2020). Biomechanics of Sport and Exercise (4th Edition). Human Kinetics.

Schmidt, R.A., Lee, T.D. (2020). Motor Learning and Performance. (6th Edition). Human Kinetics.

Hardcopies of these books are available for purchase at Librarie Paragraphe (2220 McGill College Avenue)

eTextbook options available online at www.humankinetics.com

5. Course Content

Calendar (subject to minor changes)



Oral presentations by students



Laboratory

	<i>Biomechanics</i>		<i>Tutorial</i>		<i>Motor Learning</i>	
wk	date	Tuesdays 13:05 – 14:25	date	Tue	date	Thursdays 13:05 – 14:25
1		N/A	N/A	N/A	1/4	Introduction
2	1/09	Processing Information (Schmidt, Ch. 2)	1/9	Tutorial (optional)	1/11	Cont. Processing Information
3	1/16	Forces (McGinnis, Ch. 1)	1/16	Tutorial (optional)	1/18	Attention and Performance (Schmidt, Ch. 3)
4	1/23	Linear Kinematics (McGinnis, Ch. 2)	1/23	Tutorial (optional)	1/25	Sensory Contributions (Schmidt, Ch. 4)
5	1/30	Linear Kinetics (McGinnis, Ch. 3)	1/30	Tutorial (optional)	2/1	Motor Programs (Schmidt, Ch. 5)
6	2/6	Work, Power, and Energy (McGinnis, Ch. 4)	2/6	Tutorial (optional)	2/8	Cont. Motor Programs (librarian visit) (Schmidt, Ch. 5)
7	2/13	Torques and Moments (McGinnis, Ch. 5) Groups 4 & 3	2/13	Tutorial (optional)	2/15	LAB 1: Prism/Mirror drawing + How to prepare your report
8	2/20	QUIZ + Review of key concepts	2/20	Tutorial (optional)	2/22	Midterm Exam (Lectures wk 1-6)
9	2/27	Angular Kinematics (McGinnis, Ch. 6) Groups 2 & 6	2/27	Tutorial (optional)	2/29	LAB 2: Speed, Accuracy, Coordination (Schmidt, Ch. 6)
x	March 5th and 7th - Study Week (No Class)					
10	3/12	Angular Kinetics (McGinnis, Ch. 7) Groups 7 & 1	3/12	Tutorial (optional)	3/14	Motor Learning (Schmidt, Ch. 8-9)
11	3/19	Fluid Mechanics (McGinnis, Ch. 8) Groups 8 & 5	3/19	Tutorial (optional)	3/21	Organizing Practice (Schmidt, Ch. 10)
12	3/26	Qualitative Biomechanical Analysis (McGinnis, Ch. 13)	3/26	Tutorial (optional)	3/28	Augmented Feedback (Schmidt, Ch. 11)
13	4/2	Qualitative Biomechanical Analysis (McGinnis, Ch. 14)	4/2	Tutorial (optional)	4/4	Augmented Feedback (Schmidt, Ch. 11)
14	4/9	QUIZ + review of key concepts	4/9	Tutorial (optional)	4/11	Review for Final Exam
EXAM PERIOD: Final Exam (Comprehensive with focus [75%] on Lectures wk 8-12)						

6. Student Assignment and Evaluation

Midterm Exam: Lectures wk 1-7	20%
Final Exam: Lectures wk 8-13	30%
Quizzes (2)	5%
Laboratory Reports (5 X 4%)	20%
Oral Presentation	
Presentation	20%
Attendance & participation	5%
<hr/>	
Total	100%

Exams (50%):

Exams will evaluate your knowledge of the material covered during lectures and laboratories. The final exam will occur within the exam period at a date and time to be announced by the Exam Office (<http://www.mcgill.ca/students/exams>). Students are advised **NOT** to make travel arrangements until after the final exam schedule has been posted. The final exam **WILL** be cumulative, but weighted more heavily on the material covered in the second half of the course.

Quizzes (5%):

Two quizzes will take place over the semester and will focus mainly on Biomechanics material but will also include a few questions on Motor Learning.

Laboratory Reports (20%):

Five laboratories will span over the semester. Students will work in groups to collect data, as specified for each laboratory. A group laboratory report will be due 1 week after completing the laboratory except for LAB 3 on Torque to be submitted at the end of the laboratory. Attendance during laboratories will be taken and is mandatory. Laboratory reports will not be accepted if the student missed the laboratory and will result in a mark of 0.

Oral Presentation (25%):

Student teams will teach biomechanics or motor learning concepts. Students will be randomly assigned to one of eight groups (5 or 6 students per group). Topics will also be randomly assigned.

Presentations will have a duration between **20 and 25 minutes**.

- **Presentation – 20%**

You will team-teach the assigned topic during regular class time. The instructor and TA will be following a detailed rubric to grade your presentation (rubric available on MyCourses). Twenty percent of your final grade will be assigned using that rubric.

- **Attendance and participation – 5%**

Attendance during oral presentations will be taken and is mandatory. You are expected to be on time for the oral presentations, to listen, offer ideas and ask questions, not to display disruptive behavior.

7. McGill Policy Statement: 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. 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. Students must ensure that they monitor the email address linked to MyCourses (@mail.mcgill.ca or @mcgill.ca).

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](#)" (Approved by Senate on 29 January 2003) (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 (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 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.

11. MELS Professional Competencies for the Teaching Profession relevant to EDKP208

This course provides an opportunity for students to develop 3 of the 12 core competencies required in the teaching profession.

Competency 1– To act as a professional who is inheritor, critic and interpreter of knowledge or culture when teaching students.

As in most theory courses, the knowledge taught in this course will allow students to use this information as part of their overall strategy to help them select the underlying reasons driving their methods in a classroom setting. Information from this course will provide a strong rationale to inform the student's professional approach as a physical and health educator. This will be useful in guiding, justifying and explaining the

curriculum to their students. Evaluation procedures will check the level of competence and understanding as it relates to this information.

Competency 2- To communicate in the language of instruction, both orally and in writing, using correct grammar, in various contexts related to teaching. Specific terminology and vocabulary used with this subject matter is taught. This knowledge will enhance the students' ability to effectively communicate ideas and subject matter using appropriate writing and speaking skills for the subject material. This is a good opportunity for prospective teachers to develop linguistic competency in general and specifically to the scientific terminology used in biomechanics and motor learning.

Competency 8- To integrate information and communications technologies (ICT) in the preparation and delivery of teaching and learning activities and for instructional management and professional development purposes. In this theory course technologies including animation software, internet, MyCourses, and computer presentation software are used to enhance the learning environment of the student. This technology is easy to use and is very accessible and applicable to the student for future use as teachers in the field. There are also many situations where this technology is not applicable to the learning situation and the students will have an opportunity to see examples of and recognize the advantages and limitations of using such technology in certain teaching situations. Other approaches that are more practical will also be used in the course and will help the student recognize the relative advantages and disadvantages of ICT with this course material. More practically, the student's appropriate use, and plan for use, of video technology in assessing performance within a physical and health education setting will be evaluated.

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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