

Department of Kinesiology and Physical Education  
McGill University

**EDKP 208: Biomechanics and Motor Learning (3 credits)**  
**Winter 2020 – March 23, 2020 revision**

---

**Coordinator:** Caroline Paquette, PhD

**Office:** room 224, Currie Gymnasium

**Phone number:** (514) 398-4184 x00890

**E-mail:** [caroline.paquette@mcgill.ca](mailto:caroline.paquette@mcgill.ca)

**Office hours:** **Email or by appointment via Zoom**

**Teaching Assistants:** Alexandra Potvin-Desrochers  
[alexandra.potvin-desrochers@mail.mcgill.ca](mailto:alexandra.potvin-desrochers@mail.mcgill.ca)  
Alejandra Martinez  
[alejandra.martinez2@mail.mcgill.ca](mailto:alejandra.martinez2@mail.mcgill.ca)  
Matt Slopecki  
[matthew.slopecki@mail.mcgill.ca](mailto:matthew.slopecki@mail.mcgill.ca)

**Course Assistant - Tomlinson Engagement Awardee for Mentoring (TEAM):**  
Kevin Madden  
[kevin.madden@mail.mcgill.ca](mailto:kevin.madden@mail.mcgill.ca)  
Anik Tavares-Dagenais  
[anik.tavares-dagenais@mail.mcgill.ca](mailto:anik.tavares-dagenais@mail.mcgill.ca)

**Lectures (13 weeks)**

Tuesdays & Thursdays 4:05-5:25 pm **Currie 408/9 Online from March 30**

**Tutorials (13 weeks)**

Thursdays 9:05-9:55 am **Currie 305/6 Online from March 30**

**Prerequisites:** EDKP 293 Anatomy & Physiology

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

---

**1. Course Description**

This course is designed to provide physical and health education students with basic, qualitative, 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 sport situations;
  - a. Teach biomechanics/motor learning principles;
  - b. Analyze a sport skill qualitatively and apply motor learning principles to improve performance.

### 3. Course Content

Calendar (subject to minor changes)



Denotes oral presentations by students



Laboratory

|   | <i>Biomechanics</i> |   | <i>Review</i> |  | <i>Motor Learning</i> |  |
|---|---------------------|---|---------------|--|-----------------------|--|
| wk  | date                | Tu 4:05pm to 5:25pm   | date          | Th 9:05am to 9:55am                      | date                  | Th 4:05pm to 5:25pm  |
| 1   | 1/7                 | Introduction  | 1/9           | Review (optional)                        | 1/9                   | Processing Information (Schmidt, Ch. 2)  |
| 2   | 1/14                | Forces (McGinnis, Ch. 1)  | 1/16          | Review (optional)                        | 1/16                  | Attention and Performance (Schmidt, Ch. 3)   |
| 3   | 1/21                | Linear Kinematics (McGinnis, Ch. 2)   | 1/23          | Review (optional)                        | 1/23                  | Sensory Contributions (Schmidt, Ch. 4)   |
| 4   | 1/28                | Linear Kinetics (McGinnis, Ch. 3)   | 1/30          | Review (optional)                        | 1/30                  | Sensory Contributions (Schmidt, Ch. 4)    |
| 5   | 2/4                 | Work, Power, and Energy (McGinnis, Ch. 4)   | 2/6           | Review (optional)                        | 2/6                   | Motor Programs (Schmidt, Ch. 5)  |
| 6   | 2/11                | Torques and Moments (McGinnis, Ch. 5)   | 2/13          | <b>QUIZ</b>                              | 2/13                  | Speed, Accuracy, Coordination (Schmidt, Ch. 6)   |
| 7   | 2/18                | Review for Midterm  | 2/20          | Review (optional)                        | 2/20                  | Midterm Exam (Lectures wk 1-6)   |
| 8   | 2/25                | Angular Kinematics (McGinnis, Ch. 6)   | 2/27          | Review (optional)                        | 2/27                  | Motor Learning (Schmidt, Ch. 8-9)  |
|   | 3/3                 | <b>Study Week (No Class)</b>  |               |  |                       |  |
| 9   | 3/10                | Angular Kinetics (McGinnis, Ch. 7)   | 3/12          | Review (optional)                        | 3/12                  | Organizing Practice (Schmidt, Ch. 10)            |
| 10  | 3/17                | <b>Cancelled</b>  | 3/19          | <b>Cancelled</b>                         | 3/19                  | <b>Cancelled</b>   |
| 11  | 3/24                | <b>Cancelled</b>  | 3/26          | <b>Cancelled</b>                         | 3/26                  | <b>Cancelled</b>   |
| 12  | 3/31                | Qualitative Biomechanical Analysis (McGinnis, Ch. 13-14)  | 4/2           | N/A<br><b>April 1, 11:59PM lab 4 due</b> | 4/2                   | Augmented Feedback 1 <b>ONLINE via Zoom @ 4:05PM</b> + Augmented Feedback 2 <b>OFFLINE</b> (Schmidt, Ch. 11)                      |
| 13  | 4/7                 | Fluid Mechanics <b>ONLINE via Zoom @ 4:05PM</b> (McGinnis, Ch. 8)    | 4/9           | <b>QUIZ ONLINE on MyCourses @ 9:05AM</b> | 4/9                   | Final Review <b>ONLINE via Zoom</b>  |
| <b>April 22, 2020, 9AM: Final Exam (Comprehensive with focus [75%] on Lectures wk 8-13) on MyCourses, open book</b> |                     |   |               |  |                       |  |

#### 4. Instructional methods

Lecture: PowerPoint presentations available through MyCourses.

Laboratories:

1. January 30 – Prism/mirror drawing
2. February 11 – Torque
3. February 13 – Fitt's Law
4. March 12 – Cup stacking
5. **March 26 – Guidance**

**After March 30th due to the extraordinary circumstances of COVID-19, our course will be delivered in an online format (via Zoom, pre-recorded lectures and tutorials, myCourses).**

#### 5. Required course materials

McGinnis, P.M. (2013). Biomechanics of Sport and Exercise (3<sup>rd</sup> Edition). Human Kinetics.

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

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

*eTextbook options available online at [www.humankinetics.com](http://www.humankinetics.com)*

#### 6. Student Assignment and Evaluation

|   |             |
|---|-------------|
| Midterm Exam: Lectures wk 1-7                         | 20%         |
| Final Exam: Comprehensive with focus [75%] on wk 8-13 | 30%         |
| Quizzes (2)   | 5%          |
| Laboratory Reports (4)                                | 20%         |
| Oral Presentation                                     |             |
| Presentation  | 20%         |
| Attendance & participation                            | 5%          |
| <b>Total</b>  | <b>100%</b> |

#### 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. **A final examination will take place as scheduled on April 22 at 9:00AM. This examination will have a hybrid format to be answered online in the Quiz section on MyCourses and take-home style to be uploaded in the Assessments section on MyCourses as well. Should there be any concern regarding your access to a computer to write/upload your exam on that**

day, please contact me in advance so arrangements can be made to facilitate the administration of this exam.

#### **Quizzes (5%):**

Two quizzes will take place over the semester and will focus on Biomechanics material. **The second quiz will be taken online on MyCourses on April 9<sup>th</sup> @ 9:05AM.**

#### **Laboratory Reports (20%):**

**Five Four** laboratory will span over the semester. **Each lab will be worth 5%.** Students will work in groups as described for each laboratory to collect data. An individual laboratory report (one per student) will then be due 1 week after completing the laboratory. **Lab 4 is due April 1<sup>st</sup> at 11:59PM.** 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. **Lab 5 has been removed because of the COVID-19 situation.**

#### **Oral Presentation (25%):**

Student teams will be required to teach a biomechanics or motor learning concept. Students will be assigned to one of eight groups (~ 5 students per group). Topics will be randomly assigned and communicated in the week of January 14, 2020. Presentations will have a duration between 35 and 40 minutes. **As of March 30, the three remaining oral presentations have been rescheduled to take place on April 2 and April 7 during regular class time (4:05pm) via Zoom. One of the remaining presentations will be pre-recorded for you to review independently.**

##### *1- 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.

##### *2- 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. **Although participation and attendance are strongly encouraged, they are not mandatory after March 30. Participation marks will be prorated to your engagement prior to the 2-week hiatus.**

#### **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.”*

#### **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 (see <http://www.mcgill.ca/students/srr/honest> 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.

As per McGill email policy, I will only answer emails from your official McGill account.

## **9. 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.