

EDKP 208: Biomechanics and Motor Learning (3 credits) Winter 2021

Coordinator: Dr David Pearsall and Dr Benoit Gentil

Office: virtual office, Currie Gymnasium

Phone number: virtual meeting only

E-mail: david.pearsall@mcgill.ca. (biomechanics) , benoit.gentil@mcgill.ca (motor control)

Office hours: after class, or by appointment

Teaching Assistants: Julien Clouette
julien.clouette@mail.mcgill.ca

Lectures (13 weeks)

Mondays and Wednesday 8:35am 9:55am **virtual (zoom)**

Tutorials (13 weeks)

Wednesday 10:05-10:55 am **virtual (zoom)**

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

wk	Biomechanics		Review/questions		Motor Learning	
	date	Mo 8:35am to 9:55am	date	We 10:05am to 10:55am	date	We 8:35am to 9:55am
1	1/11	Introduction	1/13	Review (optional)	1/13	Processing Information (Schmidt, Ch. 2)
2	1/18	Forces (McGinnis, Ch. 1)	1/20	Review (optional)	1/20	Attention and Performance (Schmidt, Ch. 3)
3	1/25	Linear Kinematics (McGinnis, Ch. 2)	1/27	Review (optional)	1/27	Sensory Contributions (Schmidt, Ch. 4)
4	2/1	Linear Kinetics (McGinnis, Ch. 3)	2/3	Review (optional)	2/3	Sensory Contributions (Schmidt, Ch. 4) Lab1: the tickle
5	2/8	Work, Power, and Energy (McGinnis, Ch. 4)	2/10	Review (optional)	2/10	Motor Programs (Schmidt, Ch. 5)
6	2/15	Torques and Moments (McGinnis, Ch. 5) Lab 2	2/17	QUIZ	2/17	Speed, Accuracy, Coordination (Schmidt, Ch. 6) Lab 3: method of His bratness
7	2/22	Review for Midterm	2/24	Review (optional)	2/24	Midterm Exam (Lectures wk 1-6)
8	3/1	Study Week (No Class)				
9	3/8	Angular Kinematics (McGinnis, Ch. 6)	3/10	Review (optional)	3/10	Motor Learning (Schmidt, Ch. 8-9)
10	3/15	Angular Kinetics (McGinnis, Ch. 7)	3/17	Review (optional)	3/17	Organizing Practice (Schmidt, Ch. 10) Lab 4: Bend It Like Becker
11	3/22	Qualitative Biomechanical Analysis (McGinnis, Ch. 13)	3/24	Review (optional)	3/24	Augmented Feedback (Schmidt, Ch. 11)
12	3/29	Fluid Mechanics (McGinnis, Ch. 8)	3/31	Review (optional)	3/31	Augmented Feedback (Schmidt, Ch. 11) Lab: The Coach as a Dictionary
13	4/5	Qualitative Biomechanical Analysis (McGinnis, Ch. 14)	4/7	QUIZ	4/7	Motor Learning Review
14	4/12	Biomechanics Review	4/14	Review (optional)	4/14	Review for Final Exam
EXAM PERIOD: Final Exam TBD (Comprehensive with focus [75%] on Lectures wk 8-14)						

4. **Instructional methods**

Lecture: PowerPoint presentations available through MyCourses.

Laboratories: Zoom support and report due dates

Motor control lab and due date:

- the tickle February, 17th
- method of His bratness, March 10th
- Bend It Like Becker, March 31st
- the Coach as a Dictionary, April 14th

Biomechanics:

- reviews questions chap5 questions 1,2,9,10

Labs requiring a report are identified in the course content section as well as their weight. Please submit your report at the indicated deadline. If you cannot provide your report, please email to Dr. GENTIL (benoit.gentil@mcgill.ca) prior to lab. Reports received after class will be considered late. Late assignments will incur a penalty: 1 day late = -10%, 2 days late = -30%. Papers received > 2 days after the specified due date will be marked as a zero (0).

5. **Required course materials**

McGinnis, P.M. (2013). Biomechanics of Sport and Exercise (3rd 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 Librairie Paragraphe (2220 McGill College Avenue)

eTextbook options available online at 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)	10%
Laboratory Reports	20%
Infographic and Oral Presentation	20%

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 (10%):

Two quizzes will take place over the semester and will focus on Biomechanics material.

Laboratory Reports (20%):

Four laboratory will span over the semester. Students will work in groups as described for each laboratory to collect data. An individual laboratory report (one per student) will then be due 2 weeks after completing the laboratory.

Topics:

Biomechanics 1) Torques and Moments, 2) Angular Kinematics, 3) Angular Kinetics, 4) Fluid Mechanics) and

Motor learning: 1) Speed, Accuracy, 2) Coordination, 3) Organizing Practice, 4) augmented feedback

Infographic and presentation (20%):

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. The team will have to prepare an infographic as a form of a poster and select one of your member to present the poster in a 3 min talk format at the end of a class. The instructor and TA will be following a detailed rubric to grade your presentation (rubric available on MyCourses).

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. Remote delivery.

This course will use a remote delivery format for the fall semester. The remote learning context presents new challenges for all involved, and student engagement is of particular

concern. This course is designed to consider the challenges that students may be experiencing due to the pandemic and is committed to providing a supportive learning environment. Please visit the following links related the remote delivery of this course: Student-specific Guidelines for Remote Teaching and Learning and Remote Learning Resources.

Students' consent to being recorded: Please read the Guidelines on Remote Teaching and Learning [<https://www.mcgill.ca/tls/instructors/class-disruption/strategies/guidelines-remote>] and the course outline for this course in myCourses. You will be notified through a 'pop-up' box in Zoom if a lecture or portion of a class is being recorded. By remaining in sessions that are recorded, you agree to the recording, and you understand that your image, voice, and name may be disclosed to classmates. You also understand that recordings will be made available in myCourses to students registered in the course.

Please note that this format for the delivery of this course is unusual. It is explained by our current extraordinary circumstances, and aims to allow you, as students, to complete this term with the requisite knowledge for this course, and to succeed in your assessments. I ask for everyone's collaboration and cooperation in ensuring that the videos and associated material are not reproduced or placed in the public domain. This means that each of you can use it for your own personal purposes, but you cannot allow others to use it, by putting it up on the internet or by giving it or selling it to others who will copy it and make it available. Thank you very much for your help with this.

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10. 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.