McGill

# POTH 225: INTRODUCTION TO BIOMECHANICS: REHABILITATION SCIENCES

**Credits:** 3

**Prerequisites:**
PHGY-209 and ANAT-315

**Course Coordinators:**

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**Please note that the final directives from McGill University regarding the Winter semester course delivery method are pending, therefore, the course structure, content and assessment methods may be subject to modification.**

**Access to Instructors:** Office Hours: by appointment

**Teaching Assistants:** TBA

**Course Description:** POTH 225 is a three-credit course in the BSc. Rehabilitation Science program. Students will learn the fundamentals of biomechanical analysis applied to the extremities and lumbar spine. Students will be able to apply biomechanical principles in both clinical and research domains.

**Course Structure:** This course comprises 12 x 2 hour lectures per week and 10 x 2-hour labs/seminars per week. Labs/seminars will include practice problems, additional course content building upon lecture material, data collections and demonstrations, and a final group project.

**Prerequisites:** PHGY-209 and ANAT-315

**Course Location and Time:**
Winter semester 2024 begins January 4th and ends April 12th; Reading Week is March 4th to March 8th, 2024.

Lectures
Thursday, 11:35am-1:25pm, MCMED 1034
Labs
Early section: Wednesday 1:35pm-3:25pm McIntyre 330
Late section: Wednesday, 3:35-5:25 McIntyre 330

**Please note that students must attend on the lab day that they registered for. Students may not change lab days without the permission of the professors.**

**Course Learning Objectives:**

**By the end of this course, the student will complete the following objectives:**

***Foundational knowledge for expert in enabling occupation:***

1. Describe the laws of physics and mathematics that are relevant to human biomechanics.
2. Describe anatomical structures of the extremities and spine.
3. Apply the fundamental science of physics, mathematics and anatomy to human biomechanics.

***Expert in Enabling Occupation***

4. Describe the role of physiotherapists and occupational therapists in analyzing work activities, activities of daily living and sports activities.
5. Apply key biomechanical principles (e.g. kinematics) to human movement in a clinical or research setting.
6. Apply the fundamentals of biomechanics to clinical situations pertaining to the lower extremity, the upper extremity and the spine.
7. Analyze data collection procedures, electromyography techniques and instrumentation pertinent to biomechanics research and clinical practice.

***Scholarly Practitioner***

8. Critically appraise rehabilitation research pertaining to biomechanics.

**Suggested Textbook:**

Oatis, C.A.: Kinesiology: The Mechanics and Pathomechanics of Human Movement. 3nd ed., Baltimore: Lippincott Williams & Wilkens, 2016.

A copy will be on reserve in the McGill library.

**Student Evaluation:**

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| Midterm Exam | 25% |
| 4 Lab/Seminar assignments | 20% (total) |
| Group Project (clinical research analysis) | 20% |
| Final Exam | 30% |
| Peer Evaluation | 5% |

Exams will be composed of multiple choice questions, short answer and case study based questions. The mid-term exam will include material from week 1 to week 5 of the course. The final exam will include material from week 7 to week 13 of the course. Exams will include lecture and lab/seminar content. The group project will be presented in the 12th and 13th weeks of the

lab/seminar sessions. Groups will consist of a maximum of 4 people. The entire group will be assigned the same mark. A rubric will be provided to clarify expectations and how marks are assigned. Lab/seminar assignments will be on the following topics i) stress-strain curves and torque goniometry, ii) force plate and balance, iii) electromyography and iv) gait. Students will be given one week to complete the assignments in their assigned groups. They will be due in lab the following week. Late assignments will be penalized 5% for everyday that they are late. Peer evaluations of lab group members will be completed after the first and fourth lab assignment.

**Special Requirement for Course Completion and Program Continuation:** In order to pass the course, a total grade of C+ (60%) must be obtained in both group work and individual work.

**Consequences of not completing assignments as requested:** Student engagement in lectures and labs/seminars is mandatory. Students who miss more than 3 labs without a written note will have 10% reduction of their total course mark. A student who does not complete a required assignment and who does not have a university-recognized reason for deferral of that assignment will receive a "0" for that portion of the course.

**Course Evaluation:** End of course evaluations are one of the ways that McGill works towards maintaining and improving the quality of courses and the student's learning experience. You will be notified by email when the evaluations are available on Mercury, the online course evaluation system. Please note the minimum number of responses must be received for results to be available to students.

**Plagiarism/Academic Integrity:** McGill University and the Faculty of Medicine and Health Sciences value academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the McGill University Code of Student Conduct and Disciplinary Procedures and the Faculty of Medicine and Health Sciences Code of Conduct

*L'université McGill et Faculte de Medecine et des Sciences de la Sante attachent une haute importance à l'honnêteté académique. Ils incombent 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 Université de McGill Code de conduite de l'étudiant et des procédures disciplinaires et Faculté de médecine et des sciences de la santé.*

Note that to support academic integrity, your assignments may be submitted to text-matching or other appropriate software (e.g., formula-, equation-, and graph-matching).

**Accessible Learning Environment:** As the instructors of this course we endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with us and the *Student Accessibility and Achievement*, 514-398-6009.

**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 French any written work that is to be graded.

*Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté, sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue.*

**Diversity Statement:** The Occupational Therapy Program recognizes our responsibility to foster a learning environment in which students and instructors can engage in dialogue and exchange ideas without being made to feel unwelcome or disrespected in view of their identity or beliefs. The Program intends that the instructional design of all courses minimize any barriers to participation, particularly barriers based on age, biological sex, disability, gender identity or expression, indigenous ancestry, linguistic and cultural background, race/ethnicity, religion, sexual orientation, political views/opinions/ideologies, and any other aspect integral to one's personhood. We therefore recognize our responsibility, both individual and collective, to strive to establish and maintain a respectful environment that is free from discrimination.

**Professional Conduct:** Professionalism and accountability are expected throughout the course of the semester. This includes the on-going respectful nature of teacher-student as well as student-student interactions.

**Statement regarding mobile computing and communications (MC2) devices:** No audio or video recording of any kind is permitted without the explicit permission of the instructor. MC2 devices (cellular phones, blackberries, iPods etc.) are not to be used for voice communication without the explicit permission of the instructor. Students must ask for permission from the instructor if any one of these devices needs to be on for the duration of class. Lap tops are permitted in class under the following condition(s): only for note taking and consulting online resources. Non- compliance with these guidelines will result in the student being asked to leave class. In the event of a second offence, the student will be asked to meet with the program director.

**Copyright:** Instructor generated course materials are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Note that infringement of copyright can be subject to follow up by the university under the Code of Student Conduct and Disciplinary Procedure.

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