



We recognize and acknowledge that McMaster University meets and learns on the traditional territories of the Mississauga and Haudenosaunee nations, and within the lands protected by the "[Dish With One Spoon](#)" wampum, an agreement amongst all allied Nations to peaceably share and care for the resources around the Great Lakes.

KINESIOL 1E03 – MOTOR CONTROL AND LEARNING 2022 FALL Term

Instructor: Laura St. Germain | **E-mail:** stgerml [at] mcmaster [dot] ca
Office: IWC 214 | **Student (office) hours:** Monday 10:30-11:30
Wednesday 11:00-12:00
by appointment

Class Schedule

Our class will be held in **JHE 376** on:

Monday 9:30-10:20
Tuesday 10:30 - 11:30
Thursday 9:30 - 10:20

Course Description

Examination of the behavioral and psychological principles of motor control and motor learning. Topics include measurement of motor performance, sensory processes, perception, memory, attention, practice and feedback, and neuroscience fundamentals in motor control.

Prerequisite(s): Registration in Level I or above of Kinesiology program.

Course and Learning Objectives

Content-based Learning Objectives

Upon completion of this course, the student will be able to:

1. Explain the distinction between behaviour that is goal-directed and behaviour that is not goal-directed.
2. Identify and describe different taxonomies used to classify motor skills.
3. List, explain, and calculate common variables used to measure motor performance.
4. Describe sensory systems that support human motor behaviour.
5. Compare and contrast different classes of control.
6. Describe processes underlying motor preparation and factors that influence preparation.
7. Describe and explain the interaction between attention and motor performance.
8. Describe the relationship between speed and accuracy in aiming tasks.



9. Define and distinguish between the terms performance and learning.
10. Identify and describe different methods to assess motor skill learning.
11. Compare and contrast different models of skill acquisition.
12. Identify, describe, and compare different conditions of practice for learning.
13. Explain why some conditions of practice are more effective than others.
14. Interpret, summarize, and discuss data from common tasks used in the study of motor control and learning.

Skill-based Learning Objectives

Upon completion of this course, the student will be able to:

1. Locate, synthesize, and critically appraise relevant research.
2. Differentiate scientific and non-scientific sources of information
3. Develop effective strategies to work independently and collaboratively in small teams.
4. Successfully navigate unforeseen challenges as they arise through collaborative problem-solving.
5. Apply effective time management techniques to deliver required products on time.

Materials & Fees

Required Materials/ Resources

There is no required textbook for this course. Assigned readings will be made available on Avenue. Relevant chapters from the supplemental textbook are included for those interested in additional information beyond that covered in the lectures.

Supplementary Materials/ Resources

1. Magill, R., & Anderson, D. (2017). *Motor learning and control: Concepts and applications*
 - You can access the textbook for free through the McMaster Library [here](#).
 - You will need to login using your MacID and password to access the textbook.

Course Overview and Assessment

Topics

Our capacity to move is more than just a convenience allowing us to walk, play, or manipulate objects—it is a critical aspect of our evolutionary development (Schmidt 1982) because it provides the only means we have to interact with the world and other people (Wolpert, Ghahramani, & Flanagan 2001). These interactions can be hard-wired or learned through experience. Motor control and learning is the scientific

field of study concerned with these interactions. This course is comprised of a Course Introduction (Sept 6), a Motor Control Module (Sept 8 to Oct 20), and a Motor Learning Module (Oct 24 to Dec 8).

Date	Lecture Topics	Readings/Comments
Sept 6	Welcome	
Sept 8	Motor skills: Fundamentals	
Sept 12	Motor skills: Classification	Reading 1
Sept 13	Measurement: Error	
Sept 15	Measurement: Reaction times	
Sept 19	In-class Assignment 1	
Sept 20	Sensorimotor foundations	
Sept 22	Visuomotor foundations	
Sept 26	In-class office hours	
Sept 27	Test 1 – Multiple choice	
Sept 29	Test 1 – Short and long answer	
Oct 3	Classes of control	Reading 2
Oct 4	Information processing	
Oct 6	Compatibility and complexity	
Oct 10-14	READING WEEK – ENJOY YOUR BREAK! (NO CLASS)	
Oct 17	Attention and coordination	
Oct 18	Speed and accuracy	
Oct 20	In-class Assignment 2	
Oct 24	Motor learning: fundamentals	Reading 3
Oct 25	Models of skill acquisition	
Oct 27	Attentional focus	
Oct 31	In-class office hours	
Nov 1	Test 2 – Multiple choice	
Nov 3	Test 2 – Short and long answer	
Nov 7	Augmented feedback I	Reading 4
Nov 8	Augmented feedback II	
Nov 10	Practice variability I	
Nov 14	In-class Assignment 3	
Nov 15	Practice variability II	
Nov 17	Observational learning I	
Nov 21	Observational learning II	Reading 5
Nov 22	Metascience	Guest lecture by Dr. Brad McKay
Nov 24	Metascience in motor learning	Guest lecture by Dr. Brad McKay



Nov 28	In-class office hours
Nov 29	Test 3 – Multiple choice
Dec 1	Test 3 – Short and long answer
Dec 5	In-class Assignment 4
Dec 6	Optional tutorial
Dec 8	BONUS In-class Assignment

Evaluation

Assessment Method	Weight	Notes	Dates
Test 1	20%	See below	Sept 27 & 29
Test 2	20%	See below	Nov 1 & 3
Test 3	20%	See below	Nov 29 & Dec 1
In-class assignments	30%	4 @ 7.5% each	Sept 19, Oct 20, Nov 14, Dec 5
Reading quizzes	10%	5 @ 2% each	Due at 11:59 pm on Friday the week the reading is assigned
Total	100%		

Tests

Three (3) tests will be administered throughout the semester. These tests will take place on the dates indicated in the course schedule and will assess content from both lectures and readings for the identified topics. Each test is worth 20% of your final grade. Further details regarding these tests will be provided in lecture. Tests are closed-book and must be completed independently.

In-class assignments

Four (4) assignments will be assigned and completed during class time on the dates indicated in the course schedule. Each will have a value of 7.5% of your final mark. *The ICAs will be assigned and due in the same lecture.* The ICAs will be completed in pairs and will challenge you to think critically about a specific topic related to human motor control and learning. There will be an optional bonus ICA at the end of the semester which may replace your lowest ICA grade. You are permitted a cheat-sheet that must be no larger than 8.5 x 11 inches and one-sided, and must complete the ICAs with a partner.

Reading quizzes

You are responsible for all required course readings. We will not cover all the content contained in each reading; however, this material is fair game for tests and in-class assignments. There will be five (5) reading quizzes, and each reading quiz is worth 2% for a total of 10% of your final grade. Quizzes will be made available for one week and therefore, make-up quizzes *will not be allowed*. Reading quizzes will be

made available on Avenue on Monday at 8 am and will be due on Friday at 11:59 pm the week the reading is assigned. Reading quizzes are open-book and may be completed collaboratively.

Course Bonus

During the semester, you will be provided the opportunity to earn a 5% bonus toward your lowest test grade. For this bonus, you are invited to participate in a motor control/learning experiment in the Action, Cognition & Metascience laboratory at McMaster University. You will be provided with the option of deciding whether A) your data is collected and used in the final analysis or B) your data is not collected and not used in the final analysis. If you choose Option A, the data that is used in the final analysis is anonymized and therefore cannot be linked back to you. Independent of your decision (A or B), this bonus will take approximately 2 hours to complete. Neither myself nor any of the course TAs will be made aware of which option you select until all course evaluations have been completed. You must complete either of these options by the last day of class (December 8, 2022). The Final exam (to be scheduled by the Registrar) will also be the date by which you must complete either of the options. Please contact the research assistants at [motorlab \[at\] mcmaster \[dot\] ca](mailto:motorlab@mcmaster.ca) to receive the Letter of Information and schedule your dates for participating.

Final exam

There is no final exam for this course. Enjoy your break after the semester!

Requests for Relief for Missed Academic Term Work

[McMaster Student Absence Form \(MSAF\)](#): In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”.

Academic Accommodation of Students with Disabilities

Students with disabilities who require academic accommodation must contact [Student Accessibility Services \(SAS\)](#) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University’s [Academic Accommodation of Students with Disabilities](#) policy.

Academic Accommodation for Religious, Indigenous Or Spiritual Observances (Riso)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the [RISO](#) policy. Students should submit their request to their Faculty Office ***normally within 10 working days*** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

Courses with An On-Line Element

Some courses may use on-line elements (e.g. e-mail, Avenue to Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

Online Proctoring

Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

Academic Integrity

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

It is your responsibility to understand what constitutes academic dishonesty.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the [Academic Integrity Policy](#).

The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

Authenticity / Plagiarism Detection

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. **All submitted work is subject to normal verification that standards of academic integrity have been upheld** (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to the [McMaster Office of Academic Integrity's](#) webpage.

Conduct Expectations

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all our living, learning and working communities. These expectations are described in the [Code of Student Rights & Responsibilities \(the "Code"\)](#). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online**.

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students' access to these platforms.



Copyright and Recording

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

Research Ethics

See “Course Bonus” section.

Extreme Circumstances

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.