McGill University
Department of Kinesiology & Physical Education
EDKP 495: Scientific Principles of Training (3 credits)
Course Outline, Winter 2024

INSTRUCTOR

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TEACHING ASSISTANTS

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LECTURE DAYS, TIME, FORMAT & LOCATION

- Tuesdays and Thursdays from 10:05 – 11:25 am EST
- Education Building, Room 211 located at 3700 McTavish St., Montreal, Quebec H3A 1Y2
- Refer to *"Course Materials"* section on Page 2 below for more details.

COURSE DESCRIPTION

This course will provide students an opportunity to explore, discuss and critically look at the scientific literature as it pertains to the principles of training for human performance and physical fitness. Students will broaden their content comprehension on topics relevant to the scientific principles of training through self-directed critical analysis, dissemination, and scholarly debate of the peer reviewed literature.

COURSE OBJECTIVES

By the end of this course, students should be able to:

1) **Describe and apply** evidence-based training principles for human performance and the development or maintenance of physical fitness;
2) **Identify, critically evaluate, disseminate and debate** research materials essential to the understanding of the physiological factors related to a change (or lack thereof) in human performance and/or physical fitness in response to a particular mode/form/type of exercise training;
3) **Integrate, synthesize and apply** the scientific literature to design an evidence-based exercise training program targeted specifically to an individual and their performance and/or physical fitness goals.

COURSE MATERIALS

- All lecture slides and recordings, including scholarly Pro-Con debates, will be made available to students through the EDKP 495 *MyCourses* site.
- Unless otherwise announced, lectures will be presented sequentially in-person during the scheduled lecture period (Tuesdays and Thursdays from 10:05 – 11:25 am EST).
- Lecture slides will be posted in .PPTX and .PDF formats to the EDKP 495 *MyCourses* site as far in advance of each scheduled class as possible.
- With few exceptions, lectures will be audio and video recorded. Unless problems arise, lecture recordings will be posted to the EDKP 495 *MyCourses* site within 24 hours from the end of each scheduled class.

READINGS & RESOURCES

- There is no required textbook(s) for this course, although a list of textbook resources is provided below.
- Copies of original research articles, topical review articles, and/or textbook chapters relevant to the content covered in lecture will be posted to the EDKP 495 *MyCourses* site.
- To help prepare their infographic assignments, debate material and individualized exercise training program assignment, students will be required to search and access additional scientific material from the library, through the McGill library website, through PubMed (http://www.ncbi.nlm.nih.gov/pubmed/) and/or Google Scholar (https://scholar.google.ca/).

Textbook resources (not an exhaustive list):

- NCSA's Essentials of Strength Training and Conditioning, 2016. ISBN: 978-1-4925-0162-6
- ACSM's Guidelines for Exercise Testing and Prescription, 2014. ISBN: 978-1-60913-605-5
- ACSM's Foundations of Strength Training and Conditioning, 2012. ISBN: 978-0-7817-8267-8
- Advanced Fitness Assessment and Exercise Prescription, 2014. ISBN: 978-1-4504-6820-6
- Science and Development of Muscle Hypertrophy, 2021. ISBN: 978-1-4925-9767-4
- Periodization Training for Sports, 2015. ISBN: 978-0-5852-4685
- NCSA's Essentials of Tactical Strength and Conditioning, 2017. ISBN: 978-1-4504-5730-9
- NCSA's Developing Power, 2017. ISBN: 978-0-7360-9526-6
- NCSA's Developing Endurance, 2012. ISBN: 978-0-7360-8327-0
- NCSA's Developing Agility and Quickness, 2011. ISBN: 978-0-7360-8326-3
- NCSA's Developing Speed, 2013. ISBN: 978-0-7360-8328-7
- NCSA's Guide to Sport and Exercise Nutrition, 2011. ISBN-13: 978-0-7360-8349-2

COURSE EVALUATION (*there are no quizzes or exams*)

COMPONENT	WEIGHT
1. Infographic Assignment 1	12.5%
2. Infographic Assignment 2	12.5%
3. Scholarly Pro-Con Debate	30% + 2% bonus for consensus winner of the debate
4. Design of an Individualized and Evidence-Based Exercise Training Program	35%
5. Attendance and Participation in Scholarly Pro-Con Debates	10%

Unless instructed otherwise, **assignments must be submitted electronically *via* the Assignments tab/tool on the EDKP 495 *MyCourses* site by the dates and times listed in the green cells of the "EVALUATION COMPONENTS" table below.** Assignments can be submitted in any file format, so long as they can be opened with most computer operating systems. However, the preferred format for submission of the infographic assignments is .PDF, whereas the preferred format for submission of the individualized exercise training program assignment is .DOCX.

Deadlines: No extensions will be granted, although valid exceptions such as illness may be considered by Prof. Jensen and may require supporting documentation (e.g., doctor's note). If students feel there is a problem, they should advise Prof. Jensen as early in the semester as possible when there may be time to provide help/accommodation. Supplementary assignments for a higher final grade will not be considered.

EVALUATION COMPONENTS:		
Components 1 & 2	**Value:** 12.5% each (25% total)	**Submission deadlines:** Infographic 1 – no later than 11:59:59 pm EST on Friday, February 2nd Infographic 2 – no later than 11:59:59 pm EST on Friday, February 23rd
Please note that a list of infographic assignment topics as well as a handout with detailed instructions on how to complete the assignments and also how the assignments will be evaluated will be posted to the EDKP 495 *MyCourses* site by no later than 11:59:59 pm EST on Friday, January 12th		
Infographic Assignments 1 and 2	Knowledge translation is a key component of the research process and most professions. An increasingly important skill related to knowledge translation is for individuals educated in a particular field of research to disseminate the results of scientific publications to lay audiences in an understandable way. This is especially true in a modern world where knowledge translation often occurs through social media platforms such as X (formerly Twitter) or Instagram. The purpose of the infographic assignment is for students to identify, critically evaluate, integrate and synthesize key methods and findings from a scientific study and present those methods and	

	findings in a visually appealing way that will understood by a lay audience. **The assignment must be completed <u>individually</u>**. Briefly, students will be provided with a list of potential topics directly relevant to the course to choose from and to help guide their search for an appropriate scientific study. Students will identify an original research study or systematic review/meta-analysis that (i) aligns with a topic from the list, (ii) is of particular interest to them, and (iii) has been published in a reputable journal within the last five years. Having selected a research paper, students must then create an infographic to present the key methods and summary the key findings/results. Students must not duplicate topics; that is, the topics selected for infographic assignments 1 and 2 must be different from each other. Students will be provided a handout with detailed instructions on how to complete the assignments as well as how the assignments will be evaluated.

Component 3	**Value:** 30% + 2% bonus for consensus winner	**Date:** Every Tuesday and Thursday starting Thursday, February 29th and ending Tuesday, April 9th

<u>Please note</u> the following important dates and times:

1) From 10:00 am EST on Monday, January 15th to 5:00 pm EST on Friday, January 19th, a Google form will be made available to all students to identify debate groups. Students will provide a team name along with the name and McGill ID number of each team member. Students experiencing difficulty forming or joining a group are encouraged to contact Prof. Jensen for assistance.

2) A list of pro-con debate topics will be posted to the EDKP 495 *MyCourses* site by no later than 5:00 pm EST on Wednesday, January 17th

3) From 10:00 am EST on Monday, January 22nd to 5:00 pm EST on Friday, January 26th, a Google form will be made available to all students so that each debate group can sign-up for their preferred debate topic and side of argument (pro or con). **<u>Topics and sides of argument will be selected on a first come, first serve basis until all 20 options (i.e., 2 sides/topic x 10 topics) are assigned.</u>**

4) The date of each groups' debate will be **<u>decided at random</u>** and posted to the EDKP 495 *MyCourses* site by no later than 5:00 pm EST on Monday, January 29th. A handout with detailed instructions on how each debate will be structured and evaluated will also be posted to the EDKP 495 *MyCourses* site by this time. In addition, Zoom recordings of pro-con debates from the Winter 2022 academic term will be posted to the EDKP 495 *MyCourses* site as examples.

Scholarly Pro-Con Debate	Debate has been described as an intellectual sport. As with any sport, the thrill of competition and uncertainty of outcome serve to energize the whole team. In general, debate provides an engaging, active, and learner-centered activity that is both serious and playful. Debate helps learners develop skills crucial to cognitive development, decision-making, and competing in the marketplace of ideas, including but not limited to: critical thinking; listening; evidence-based argumentation and persuasion; team work and collaboration; flexibility; public speaking; and perform well intellectually under pressure (e.g., cross-examination). The purpose of the pro-con debate is for students to work effectively in small teams to research, organize and present information on a controversial or unresolved topic relevant to the scientific principles of training in a balanced, organized, and compelling fashion. Not only should each member of the group know the scientific evidence in support of their side of the debate, but they should know the evidence in support of their opponents' side of the debate. In this way, each member of the team can provide an evidence-based defense of their own argument(s) on cross-examination as well as an evidence-based critique or cross-examination of their opponents' argument(s). **Students will work in teams of 2 or 3. If there are fewer than 20 debate teams created 'naturally' by the students in class, then teams of 3 will be asked to coordinate and create teams of 2 until exactly 20 debate teams exist.** Each member of the team is expected to contribute equally to the work. One grade will be given per team. Briefly, students will be provided with a list of debate topics to choose from on a first come, first serve basis. Having selected a debate topic, students must then research, organize and prepare a presentation that (i) cogently presents the scientific evidence supporting their side of the debate *via* opening and closing statements, (ii) rebuts and cross-examines the arguments advanced by their opponents, and (iii) responds to their opponent's rebuttal and cross-examination. There will be a total of 10 debates: one every Tuesday and Thursday (i.e., one per class) starting Thursday, February 29th and ending Tuesday, April 9th. Unless instructed otherwise, debates will be presented in-person during the scheduled class time. Debates will be video and audio recorded and posted to the EDKP 495 *MyCourses* site within 24 hours of the end of class.

	Students will be provided a handout with detailed information on how the debate will be structured and evaluated. In addition, Zoom recordings of pro-con debates from the Winter 2022 academic term will be posted to the EDKP 495 *MyCourses* site as examples.	
Component 4	**Value:** 35%	**Submission deadlines:** Deadline for preliminary review of training program by Teaching Assistants – no later than 5:00 pm EST on Friday, March 22nd, *although sooner is better for both students and Teaching Assistants!* Individualized Exercise Training Program tutorial – during the week of March 25th (date and time TBD), the Teaching Assistants will host a tutorial where they will cover each case study individually and review some general feedback points based on the preliminary drafts they had reviewed thus far. The *first half* of the tutorial *will be recorded*, whereas the *second half* will be a Q&A and *will not be recorded*. Final submission deadline (with no exceptions) – no later than 11:59:59 pm EST on Friday, April 12th (last day of classes of the Winter 2024 academic term)
Please note that a handout with detailed information on each case scenario as well as on how to complete the assignment and how the assignments will be evaluated will be posted to the EDKP 495 *MyCourses* site by no later than 5:00 pm EST on Friday, February 2nd		
Design of an Individualized and Evidence-Based Exercise Training Program	Whether for personal and/or professional reasons, it is likely that many students in EDKP 495 will need to design an exercise training program to help themselves and/or their athletes/fitness clients achieve a particular health, fitness or sport performance goal(s). With this in mind, the purpose of this assignment is to apply the knowledge acquired in EDKP 495 to the design of an individualized and evidence-based exercise training program for 1 of 5 different case scenarios. **Exercise training programs will be developed individually or in groups of no more than 2 people.** Each student working in a group of 2 is expected to contribute equally to the assignment. One grade will be given per group. Briefly, students will be provided with 5 different case scenarios to choose from. Having selected a case scenario, students must then	

	design an exercise training program to help the 'case' achieve their stated goal(s) within a particular window of time, making sure to provide references (published evidence) to support their programming decisions. Students will be provided a handout with detailed information on each case, how to complete the assignment, and how the assignments will be evaluated.	
Component 5	**Value:** 10%	**Date:** Every Tuesday and Thursday starting Thursday, February 29th and ending Tuesday, April 9th
Attendance at and Participation in Scholarly Pro-Con Debates	Students are expected to attend and participate in all of the scholarly pro-con debates. Attendance and participation will be documented by Prof. Jensen using the Peer Evaluation form. If there are legitimate and extraordinary circumstances that prevent a student from attending any one or combination of the scheduled debates (e.g., medical condition or emergency beyond the student's control), these circumstances should be communicated to Prof. Jensen as far in advance of class as possible and may require documentation (e.g., doctor's note). Only under legitimate and extraordinary circumstances might Prof. Jensen provide help/accommodation. **Attendance & Participation *via* Peer Evaluation (1.11% per debate x 9 debates):** Students are required to attend debate and complete a peer evaluation form where they will (i) identify the team they believe won the debate and (ii) provide a % grade evaluation of each team's performance. Peer evaluations will: (i) remain anonymous to all other students in class; (ii) contribute 25% to each team's final grade on the debate assignment; and (iii) help Prof. Jensen to identify the consensus debate winner and, by extension, the team that will receive the 2% bonus mark.	

COURSE SCHEDULE & CONTENT

- The topics outlined in the table below are subject to change as the course dictates with prior notification. Students will be notified of such changes *via* email and/or an announcement posted to the EDKP 495 *MyCourses* site with as much advance notice as possible.
- Refer to *Course Materials* section on Page 2 above for information on when and how course content will be delivered.

Week	Date	Topic	Date	Topic
1	--	--	January 4	Course introduction
2	January 09	General principles of strength training and conditioning 1	January 11	General principles of strength training and conditioning 2
3	January 16	General adaptations to resistance training	January 18	General adaptations to aerobic training
4	January 23	General adaptations to concurrent resistance-aerobic training	January 25	Training periodization and tapering
5	January 30	Program design for resistance training 1	February 01	Program design for resistance training 2
6	February 06	Program design for resistance training 3	February 08	Program design for aerobic training 1
7	February 13	Program design for aerobic training 2	February 15	Program design for speed, agility, quickness and plyometric training (Guest lecturer: Jason Dellatolla, PhD candidate)
8	February 20	Strength and conditioning outcomes: Methods of assessment (Guest lecturer: Rachelle Aucoin, PhD candidate)	February 22	Nutritional strategies for maximizing training outcomes (Guest lecturer: Sarkis Hannaian, PhD candidate)
9	February 27	Pseudoscience and Misinformation in Health and Fitness (Guest lecturer: Dr. Nicholas B. Tiller, PhD)	February 29	Pro-Con Debate 1 (Topic and Teams TBD)
Week 10 - March 04-08: McGill Study Break - NO CLASSES				

Week	Date	Topic	Date	Topic
11	March 12	Pro-Con Debate 2 (Topic and Teams TBD)	March 14	Pro-Con Debate 3 (Topic and Teams TBD)
12	March 19	Pro-Con Debate 4 (Topic and Teams TBD)	March 21	Pro-Con Debate 5 (Topic and Teams TBD)
13	March 26	Pro-Con Debate 6 (Topic and Teams TBD)	March 28	Pro-Con Debate 7 (Topic and Teams TBD)
14	April 02	Pro-Con Debate 8 (Topic and Teams TBD)	April 04	Pro-Con Debate 9 (Topic and Teams TBD)
15	April 09	Pro-Con Debate 10 (Topic and Teams TBD)	--	--

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 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 www.mcgill.ca/students/srr/honest/).»

LANGUAGE OF SUBMISSION

"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."

« 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). »

ADDITIONAL STATEMENTS

- ✓ The University Student Assessment Policy exists to ensure fair and equitable academic assessment for all students and to protect students from excessive workloads. All students and instructors are encouraged to review this Policy, which addresses multiple aspects and methods of student assessment, e.g. the timing of evaluation due dates and weighting of final examinations.
- ✓ As the instructor of this course, I endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with Prof. Jensen and/or someone from the Student Accessibility & Achievement Office, 514-398-6009.
- ✓ 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 e-mail when the evaluations are available. Please note that a minimum number of responses must be received for results to be available to students.
- ✓ Mobile computing and communication devices are permitted in class insofar as their use does not disrupt the teaching and learning process.
- ✓ In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.
- ✓ Instructor generated course materials (e.g., lecture notes, handouts, summaries, exam questions, etc.) 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 infringements of copyright can be subject to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.
- ✓ McGill University is on land which has long served as a site of meeting and exchange amongst Indigenous peoples, including the Haudenosaunee and Anishinabeg nations. We acknowledge and thank the diverse Indigenous people whose footsteps have marked this territory on which peoples of the world now gather.