

McGill University
Department of Kinesiology & Physical Education
EDKP 495: Scientific Principles of Training (3 credits)
Course Outline, Winter 2021

INSTRUCTOR

Dennis Jensen, PhD

Currie Memorial Gymnasium, 475 Pine Avenue West, Room A223

Phone: 514-398-4184 ext. 0541

E-mail: dennis.jensen@mcgill.ca

Office hours:

- Between January 11th and February 26th (i.e., prior to McGill's study break), office hours will be held virtually *via* Zoom each Thursday afternoon (starting January 14th) during the scheduled lecture period; that is, from 4:05-5:25 pm EST on January 14th, 21st and 28th; and February 4th, 11th, 18th and 25th.
- Between March 8th and April 16th (i.e., after McGill's study break), office hours will be held virtually *via* Zoom and by appointment only. Contact by email for appointment.

TEACHING ASSISTANTS

Rachelle Aucoin, rachelle.aucoin@mail.mcgill.ca

Jaycie Triandafilou, jaycie.triandafilou@mail.mcgill.ca

Office hours:

- Held virtually *via* Zoom and by appointment only. Contact by email for appointment

LECTURE DAYS, TIME & FORMAT

- Tuesdays and Thursdays from 4:05-5:25 pm EST
- Due to the extraordinary circumstances of COVID-19, the course will be delivered exclusively online. Refer to "*Course Materials*" section below for more details.

COURSE DESCRIPTION

Generally speaking, this course will provide 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. **Please note** that:
 - On January 7th, the Course Introduction will be presented in real time *via* Zoom from 4:05-5:25 pm EST. Attendance is strongly encouraged, but not mandatory. For those unable to attend, the presentation will be recorded and posted to the EDKP 495 *MyCourses* site within 24 hours of the end of class.
 - Between January 12th and February 25th, all lectures will be pre-recorded using PowerPoint and posted to the EDKP 495 *MyCourses* site prior to the start of the scheduled lecture period. In other words, lectures will not occur in real time *via* Zoom.
 - Between March 9th and April 15th, course content will be presented in real time *via* Zoom from 4:05-5:25 pm EST and take the form of scholarly Pro-Con debates led by students. Attendance is mandatory and will be documented and contribute to your overall grade, as described in the “*Course Evaluation*” section below. Debates will be recorded and posted to the EDKP 495 *MyCourses* site within 24 hours of the end of 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
- Sports Injury Prevention and Rehabilitation: Integrating Medicine and Science for Performance Solutions, 2015. ISBN: 978-0-4158-1506-2

Please note that students are strongly encouraged to contact Prof. Jensen about how to gain electronic access to any one or combination of the textbook resources listed above, including copies of research articles not available online *via* the McGill library website, PubMed and/or Google Scholar.

COURSE EVALUATION (*there will be no quizzes or exams*)

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

Assignments must be submitted electronically to dennis.jensen@mcgill.ca 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 it can be opened with most computer operating systems; however, the preferred format is word or PDF. Prof. Jensen will confirm receipt of the assignment by reply email within 24 hours.

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 you feel there is a problem, please 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: 10% each (20% total)	Submission deadlines: <u>Infographic 1</u> – 11:59:59 pm EST on Tuesday February 2 nd <u>Infographic 2</u> – 11:59:59 pm EST on Thursday, February 25 th
<p><u>Please note</u> that the 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 <i>MyCourses</i> site by no later than 5:00 pm EST on Friday January 15th</p>		
Infographic Assignments 1 and 2	<p>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 Twitter or Instagram.</p> <p>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</p>	

	<p>and findings in a visually appealing way that will understood by a lay audience.</p> <p>The assignment must be completed individually. 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. This list will be generated, in part, by the students themselves. 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, ideally, within the last five years, but not before 2010. Having selected a research paper, students must then create an infographic to present the key methods and key findings.</p> <p>Students must not duplicate topics; that is, the topics selected for infographic assignments 1 and 2 must be different from each other.</p> <p>Students will be provided a handout with detailed instructions on how to complete the assignments as well as how the assignments will be evaluated.</p>
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Component 3	Value: 35% + 2% bonus for consensus winner	Date: Every Tuesday and Thursday starting Tuesday March 9 th and ending Thursday April 15 th .
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Please note the following important dates and times, which will also be communicated to students by email as well as through the calendar and announcements board of the EDKP 495 MyCourses site:

- 1) From 6:00 pm EST on Thursday January 7th to 11:59:59 pm EST to Friday January 8th, a Google form will be made available to all students so as to collect their ideas for potential pro-con debate topics.
- 2) From 10:00 am EST on Monday January 11th to 12 noon EST on Wednesday January 13th, a Google survey will be made available to all students to identify, by consensus (% majority), the top 12 pro-con debate topics from a list of ~20 topics.
- 3) From 10:00 am EST on Monday January 11th to 12 noon EST on Thursday January 14th, another Google form will be distributed to students to identify debate groups. Students will identify a team name and team members with McGill ID numbers
- 4) By no later than 5:00 pm EST on Friday January 15th, Prof. Jensen will create groups for those individuals without one. The groupings will be communicated to students by email.
- 5) From 10:00 am EST on Monday January 18th to 5:00 pm on Thursday January 21st, another Google form will be distributed to all students so that each debate group can sign-up for their

preferred topic and side of argument (pro or con). Topics and sides of argument will be selected on a first come, first serve basis until all 24 options (i.e., 2 sides/topic x 12 topics) are assigned.

6) The date of each groups' debate will be decided at random and posted to the EDKP 495 MyCourses site by no later than 5:00 pm EST on Friday January 22nd. A handout with details on how each debate will be structured and evaluated will also be posted to the EDKP 495 MyCourses site by this time.

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 groups 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 group 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 groups of 3; however, depending on the final student enrolment in this course, it is possible that some students may have to work in groups of 2 or 4. All students in the group are expected to contribute equally to the work. One grade will be given per group.

Briefly, students will be provided with a list of debate topics to choose from on a first come, first serve basis. This list will be generated, in part, by the students themselves. 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.

	<p>There will be a total of 12 debates: one every Tuesday and Thursday (i.e., one per class) starting Tuesday March 9th and ending Thursday April 15th. Debates will be presented in real time <i>via</i> Zoom during the scheduled class time. Debates will be recorded and posted to the EDKP 495 MyCourses site within 24 hours of the end of class.</p> <p>Students will be provided a handout with detailed information on how the debate will be structured and evaluated.</p>	
<p>Component 4</p>	<p>Value: 35%</p>	<p>Submission deadlines: <u>Deadline for preliminary review of training program by Teaching Assistants</u> – No later than 5:00 pm EST on Friday March 26th</p> <p><u>Final submission deadline</u> - 11:59:59 pm EST on Friday April 16th</p>
<p><u>Please note</u> 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 <u>EDKP 495 MyCourses site by no later than 5:00 pm EST on Friday January 29th</u></p>		
<p>Design of an Individualized and Evidence-Based Exercise Training Program</p>	<p>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).</p> <p>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.</p> <p>Exercise training programs will be developed individually or 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.</p> <p>Briefly, students will be provided with a list of case scenarios prepared by Prof. Jensen and his teaching assistants. 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.</p> <p>Students will be provided a handout with detailed information on each case, how to complete the assignment and how the assignments will be evaluated.</p>	

Component 5	Value: 10%	Date: Every Tuesday and Thursday from 4:05 to 5:25 pm EST starting Tuesday March 9 th and ending Thursday April 15 th .
Attendance at and Participation in Scholarly Pro-Con Debates	<p>Students are expected to attend and participate in all of the scholarly pro-con debates. Attendance and participation will be documented by Prof. Jensen <i>via</i> the usage reporting tool and polling tool in Zoom, respectively.</p> <p>If there are legitimate and extraordinary circumstances that prevent a student from attending any one or combination of the scheduled debates (e.g., extreme time zone differences from EST, medical condition or emergency beyond the student's control), these circumstances should be communicated with Prof. Jensen as far in advance of class as possible and may require documentation (e.g., doctor's note). Only under these legitimate and extraordinary circumstances might Prof. Jensen provide help/accommodation.</p> <p>Attendance (0.5% per debate [other than the student's own]): Students are required to join the meeting no later than 10 minutes after the scheduled start of class (i.e., no later than 4:15 pm EST) and leave no earlier than 10 minutes before the scheduled end of class (i.e., no earlier than 5:15 pm EST), unless of course the debate ends before this time.</p> <p>Participation <i>via</i> Peer Evaluation (0.5% per debate [other than student's own]): Using the polling tool in Zoom, students are required to (i) identify the group they believe won the debate and (ii) provide a % grade evaluation of each group's performance. Peer evaluations will: remain anonymous to all other students in the class; contribute 25% to each group's final grade on the debate assignment; and help Prof. Jensen to identify the consensus debate winner and, by extension, the group that will receive the 2% bonus mark. <i>Please note</i> that a participation mark is only possible with an attendance mark; thus, if a student joins a debate too late and/or leaves a debate too earlier (see <i>above</i>), they will receive a mark of 0% for that debate, even if they participated <i>via</i> peer evaluation.</p>	

Course Schedule and Content: Please note that 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.

Week	Date	Topic	Date	Topic
1	--		January 7	Course introduction
2	January 12	General principles of strength training and conditioning 1	January 14	General principles of strength training and conditioning 2
3	January 19	General adaptations to anaerobic training programs and factors affecting those adaptations (e.g., genetics, sex, age)	January 21	General adaptations to aerobic training programs and factors affecting those adaptations (e.g., genetics, sex, age)
4	January 26	General adaptations to concurrent resistance (anaerobic)-aerobic training	January 28	Warm-up and flexibility training
5	February 2	Program design for resistance training, including test selection, administration, scoring and interpretation 1	February 4	Program design for resistance training, including test selection, administration, scoring and interpretation 2
6	February 9	Program design for aerobic endurance training, including test selection, administration, scoring and interpretation 1	February 11	Program design for aerobic endurance training, including test selection, administration, scoring and interpretation 2
7	February 16	Program design for speed, agility, quickness and plyometric training, including test selection, administration, scoring and interpretation	February 18	Training periodization and tapering
8	February 23	Injury prevention, rehabilitation and reconditioning	February 25	Nutrition strategies for maximizing strength training, conditioning and performance outcomes
Week of March 1-5: McGill Study Break - NO CLASSES				
10	March 09	Pro-Con Debate 1 (Topic and Groups TBD)	March 11	Pro-Con Debate 2 (Topic and Groups TBD)

11	March 16	Pro-Con Debate 3 (Topic and Groups TBD)	March 18	Pro-Con Debate 4 (Topic and Groups TBD)
12	March 23	Pro-Con Debate 5 (Topic and Groups TBD)	March 25	Pro-Con Debate 6 (Topic and Groups TBD)
13	March 30	Pro-Con Debate 7 (Topic and Groups TBD)	April 1	Pro-Con Debate 8 (Topic and Groups TBD)
14	April 6	Pro-Con Debate 9 (Topic and Groups TBD)	April 8	Pro-Con Debate 10 (Topic and Groups TBD)
15	April 13	Pro-Con Debate 11 (Topic and Groups TBD)	April 15	Pro-Con Debate 12 (Topic and Groups 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 Dr. Jensen and the [Office for Students with Disabilities](#), 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.