

**McGill University**  
**Department of Kinesiology & Physical Education**  
**EDKP 495: Scientific Principles of Training (3 credits)**  
**Course Outline, Winter 2022**

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### **INSTRUCTOR**

Prof. Dennis Jensen, PhD

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Office hours: Held virtually *via* Zoom or in-person and by appointment only. Contact Prof. Jensen by email for appointment

### **TEACHING ASSISTANTS**

Rachelle Aucoin, [rachelle.aucoin@mail.mcgill.ca](mailto:rachelle.aucoin@mail.mcgill.ca)

Jason Dellatolla, [jason.dellatolla@mail.mcgill.ca](mailto:jason.dellatolla@mail.mcgill.ca)

Office hours: Held virtually *via* Zoom or in-person and by appointment only. Contact Rachelle or Jason by email for appointment

### **LECTURE DAYS, TIME, FORMAT & LOCATION**

- Tuesdays and Thursdays from 11:35 am – 12:55 pm EST
- Due to the extraordinary circumstances of COVID-19, the course will be delivered online until January 23<sup>rd</sup> or later (TBD), depending on government and/or university directives.
- Starting the week of January 24<sup>th</sup> or later (TBD), in-person lectures will be held in the Room 408/9 of the Currie Memorial Gymnasium, Department of Kinesiology and Physical Education, 475 Pine Avenue West, H2W 1S4.
- 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 Thursday, January 6<sup>th</sup>, the Course Introduction will be presented *via* Zoom from 11:35 am – 12:55 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.
  - Lectures scheduled for January 11<sup>th</sup>, 13<sup>th</sup>, 18<sup>th</sup> and 20<sup>th</sup> 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.
  - Depending on government and/or university directives, in-person teaching will resume every Tuesday and Thursday from 11:35 am – 12:55 pm EST (Currie 408/9) starting the week of January 24<sup>th</sup> and continue to the end of term, unless directed otherwise. Lecture slides will be posted to the EDKP 495 *MyCourses* site as far in advance of each in-person lecture as possible. In-person lectures will be video and audio recorded. Unless problems arise, in-person lecture recordings will be posted to YouTube (with links added to the EDKP 495 *MyCourses* site) within 24 hours from 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

**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 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 to [dennis.jensen@mcgill.ca](mailto: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 for submission of the infographic assignments is .PDF, whereas the preferred format for submission of the individualized exercise training program assignment is .DOCX. 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 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:		
<b>Components 1 &amp; 2</b>	<b>Value:</b> 12.5% each (25% total)	<b>Submission deadlines:</b> <u>Infographic 1</u> – 11:59:59 pm EST on Tuesday, February 1 <sup>st</sup>  <u>Infographic 2</u> – 11:59:59 pm EST on Thursday, February 24 <sup>th</sup>
<p><u>Please note</u> 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 <i>MyCourses</i> site by no later than 5:00 pm EST on Friday, January 14<sup>th</sup></p>		
<b>Infographic Assignments 1 and 2</b>	<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 and</p>	

	<p>findings in a visually appealing way that will understood by a lay audience.</p> <p><b>The assignment must be completed individually.</b> 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 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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<b>Component 3</b>	<b>Value:</b> 30% + 2% bonus for consensus winner	<b>Date:</b> Every Tuesday and Thursday starting Tuesday, March 8 <sup>th</sup> and ending Tuesday, April 12 <sup>th</sup>
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Please note the following important dates and times:

- 1) From 5:00 pm EST on Thursday, January 6<sup>th</sup> to 11:59:59 pm EST on Monday, January 10<sup>th</sup>, a Google survey will be made available to all students to identify, by consensus (% majority), the top 11 pro-con debate topics from a list of ~20 pre-identified topics.
- 2) From 5:00 pm EST on Tuesday, January 11<sup>th</sup> to 11:59:59 pm EST on Friday, January 14<sup>th</sup>, 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 use the *Discussions* forum on the EDKP 495 *MyCourses* site and/or to contact Prof. Jensen for assistance.
- 3) From 10:00 am EST on Monday, January 17<sup>th</sup> to 11:59:59 pm EST on Friday, January 21<sup>st</sup>, 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). **Topics and sides of argument will be selected on a first come, first serve basis until all 22 options (i.e., 2 sides/topic x 11 topics) are assigned.**
- 4) 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 Monday, January 24<sup>th</sup>. 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.

## 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. 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 11 debates: one every Tuesday and Thursday (i.e., one per class) starting Tuesday, March 8<sup>th</sup> and ending Tuesday, April 12<sup>th</sup>. 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.

<p><b>Component 4</b></p>	<p><b>Value:</b> 35%</p>	<p><b>Submission deadlines:</b>  <u>Deadline for preliminary review of training program by Teaching Assistants</u> – No later than 5:00 pm EST on Tuesday, March 22<sup>nd</sup>, <i>although sooner is better for both students and Teaching Assistants!</i></p> <p><u>Final submission deadline (with no exceptions)</u> – No later than 11:59:59 pm EST on Tuesday, April 12<sup>th</sup></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 EDKP 495 MyCourses site by no later than 5:00 pm EST on Friday, January 28<sup>th</sup></p>		
<p><b>Design of an Individualized and Evidence-Based Exercise Training Program</b></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><b>Exercise training programs will be developed individually or in groups of no more than 2 people.</b> 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 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.</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>	
<p><b>Component 5</b></p>	<p><b>Value:</b> 10%</p>	<p><b>Date:</b> Every Tuesday and Thursday starting Tuesday, March 8<sup>th</sup> and ending Tuesday, April 12<sup>th</sup></p>
<p><b>Attendance at and Participation in Scholarly Pro-Con Debates</b></p>	<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 using the Peer Evaluation form.</p>	

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% per debate, with the obvious exception of the student's own debate):** Students are required to attend class and complete a peer evaluation form where they will (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 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.

## 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 6	Course introduction ( <i>via Zoom</i> )
2	January 11	General principles of strength training and conditioning 1 ( <i>via pre-recorded .PPTX presentation</i> )	January 13	General principles of strength training and conditioning 2 ( <i>via pre-recorded .PPTX presentation</i> )
3	January 18	General adaptations to resistance training ( <i>via pre-recorded .PPTX presentation</i> )	January 20	General adaptations to aerobic training ( <i>via pre-recorded .PPTX presentation</i> )
4	January 25 (start of in-person teaching, unless otherwise notified)	General adaptations to concurrent resistance-aerobic training	January 27	Training periodization and tapering
5	February 1	Program design for resistance training 1	February 3	Program design for resistance training 2
6	February 8	Program design for resistance training 3	February 10	Program design for aerobic training 1
7	February 15	Program design for aerobic training 2	February 17	Program design for speed, agility, quickness and plyometric training ( <i>Guest lecturer: Jason Dellatolla</i> )
8	February 22	Strength and conditioning outcomes: Methods of assessment ( <i>Guest lecturer: Rachelle Aucoin</i> )	February 24	Nutritional strategies for maximizing training outcomes ( <i>Guest lecturer: Sarkis Hannaian</i> )

**Week of February 28 to March 04: McGill Study Break - NO CLASSES**

<b>Week</b>	<b>Date</b>	<b>Topic</b>	<b>Date</b>	<b>Topic</b>
<b>10</b>	March 08	Pro-Con Debate 1 (Topic and Groups TBD)	March 10	Pro-Con Debate 2 (Topic and Groups TBD)
<b>11</b>	March 15	Pro-Con Debate 3 (Topic and Groups TBD)	March 17	Pro-Con Debate 4 (Topic and Groups TBD)
<b>12</b>	March 22	Pro-Con Debate 5 (Topic and Groups TBD)	March 24	Pro-Con Debate 6 (Topic and Groups TBD)
<b>13</b>	March 29	Pro-Con Debate 7 (Topic and Groups TBD)	March 31	Pro-Con Debate 8 (Topic and Groups TBD)
<b>14</b>	April 5	Pro-Con Debate 9 (Topic and Groups TBD)	April 7	Pro-Con Debate 10 (Topic and Groups TBD)
<b>15</b>	April 12	Pro-Con Debate 11 (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/](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 [www.mcgill.ca/students/srr/honest/](http://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.