McGill University

Department of Kinesiology and Physical Education

EDKP 495: Scientific Principles of Training

COURSE OUTLINE Winter 2019

Instructor:	Dr. Celena Scheede-Bergdahl (celena.scheede@mcgill.ca) Office location/hours: Currie 222, contact by email for appointment
Class Schedule:	Monday and Wednesday, 14:35 to 15:55
Locale:	Currie 305

Course Description

This course will provide an opportunity to explore, discuss and critically look at the history and present state of the scientific literature, as it pertains to exercise prescription for human performance and physical fitness. Attention will be given to the various approaches to training that are required throughout the human lifespan. *Please note that this is not a practical skills class.*

Course Objectives

1. To introduce students to research-based principles of training for human performance and the development of physical fitness.
2. To discuss physiological issues as they relate to exercise prescription for human performance and physical fitness.
3. To have students evaluate sound training principles for human performance and appropriate exercise prescriptions for developing physical fitness and human performance.
4. To have students seek out and find research material essential to the understanding of the physiological factors related to human performance and physical fitness.
5. To have students integrate and synthesize the scientific literature to write a comprehensive research review.

Course Content

Topics listed on course schedule. Please note that topics are subject to change and notice will be given ahead of time. Please refer to *MyCourses*.

Instructional Method
Classes will be conducted in a seminar/lecture format. Student participation is required in discussions.

Course Materials
The required and suggested additional readings for the course, as well as all slides, will be made available to you in either electronic (*MyCourses*) or paper form.

Students will also be required to access additional scientific material from the library, through the library website or through PubMed (http://www.ncbi.nlm.nih.gov/pubmed/).

Course Evaluations
1) Oral presentation – 30% (group presentation of a paper, 4 per group)
2) Scientific paper – 45%: details presented below
3) Practise paper review – 5%: details to be presented in class, see March 15 in schedule
4) Scientific paper review – 15%: details to be presented in class
5) Participation – 5%: details to be presented in class

Grading rubrics will be supplied.

Missed Deadlines: Extensions will not be permitted, except with accompanying medical note. Please understand that *grading is non-negotiable* and supplementary assignments for a higher final grade will not be considered. It is not fair to your colleagues.

If you feel there is a problem, please see the instructor early in the semester. At this point, there is time to address the issue and help/accommodation may be provided.

IMPORTANT DATES AT MCGILL:

Winter Term
- Classes begin: Monday, January 7
- Study break: from March 4-8
- Classes end: Friday, April 12
- Study Days: Weekend, April 13-14
- Exams begin: Monday, April 15
- Exams end: Tuesday, April 30 (10 days, including evening exams)

Related Important Dates are built around the Key Academic Dates and are major events that occur each academic term. These include:
- Deadline to cancel registration: Monday, December 31
- Deadline to register without penalty (new students only): Monday, January 7
- Add/Drop deadline: Tuesday, January 22
- Course or University Withdrawal with refund deadline: Tuesday, January 29
- Course or University Withdrawal with NO REFUND deadline: Tuesday, March 12

ACADEMIC STATEMENTS:

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit written work in **English** or in **French**. This right applies to all written work that is to be graded, from one-word answers to dissertations.
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: www.mcgill.ca/students/srr/honest/).

Please be aware that text-matching software may be used in this course. Item 2 of the text-matching policy states, in part:

Students shall also be informed in writing before the end of the drop/add period (consider this statement as notification) that they are free, without penalty of grade, to choose an alternative way of attesting to the authenticity of their work, if necessary. These include the following:
a) submitting copies of multiple drafts;
b) submitting an annotated bibliography;
c) submitting photocopies of sources;
d) taking an oral examination directed at issues of originality;
e) responding in writing to a quiz or questions directed at issues of originality;
f) providing a written report regarding the process of completing the work; other alternatives devised by the instruction, provided that they are not unduly onerous, that they are meant to attest for authenticity of the written work, and that they meet the approval of the Dean or Disciplinary Officer in the faculty in which the course is offered.

ACADEMIC EXPECTATIONS:

- Prepare for each class ahead of time.
- Assume responsibility for own professional training.
- If you do not understand something, please ask!
- Be proactive and discuss all concerns with course instructor(s) as they arise.
- Be an active and contributing member of all group assignments.
- Active participation enhances class quality!

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 me and the Office for Students with Disabilities, 514-398-6009.

LECTURE SCHEDULE (subject to change with prior notification**)**

Week	Date	Topic
1	January 7, 9	Intro to course, expectations January 9: How to write a scientific paper and group assignments for oral presentation
2	January 14, 16	Resistance training: what we have been doing? Where are we going? Discussion
3	January 21, 23	Endurance training: what we have been doing? Where are we going? Discussion ****Scientific paper topic due on January 23****
4	January 28, 30	Concurrent exercise training methods, training intensities Encouraging exercise in previously sedentary individuals
5	February 4, 6	Blood flow restriction exercise *February 6: 2 x oral presentation*
6	February 11, 13	High intensity interval training *February 13: 2 x oral presentations*
7	February 18, 20	Training in heat and cold *February 20: 2 x oral presentations*
8	February 25, 27	Training for speed and agility *February 27: 2 x oral presentations*
	Week of March 4	READING WEEK: NO CLASSES
9	March 11, 13	**March 11: **Scientific papers V.1 due**, distribution of paper to partner** How to review a scientific paper March 13: Reviewing papers
10	March 18, 20	Exercise and altitude *March 20: 2 x oral presentations*
11	March 25, 27	Bed rest, muscle atrophy from a protein perspective *March 27: 2 x oral presentations* ****Paper reviews due March 27****
12	April 1, 3	Microgravity *April 3: 2 x oral presentations*
13	April 8, 10	Exploring ergogenic aids *(April 8: 1 x oral presentation, if needed)* *April 10: 2 x oral presentations* **April 10: **Scientific papers V.2 due****

*Students are advised to keep a copy of the course syllabus for future reference.

****GRADING GUIDELINES FOR YOUR SCIENTIFIC PAPER: paper will be graded on /65****

- Paper structure: abstract (short, no more than 350 words), Introduction (clearly state your "hypothesis" or reason for paper), Body, Discussion/Conclusions (include future directions).
- Please use APA *style* formatting (as described in class): no numbered references within text. References should include either first author (if more than 2 authors total) or both authors (if only 2 authors on paper), with year.
- If you are choosing your own topic, please review with course instructor in order to make sure that it appropriate.
- You must include at (very) least 25 high quality papers in text, if not more.

Grading rubric:

Organization of paper (/10):

- Is paper clearly divided into sections? For example, is there a proper introduction, abstract?
- Does the paper offer a conclusion?
- Is the body of the text well organized? Paragraphs?
- Does the reader have to hunt for content?
- Are thoughts well organized?

Quality of references (/10):

- Does the paper offer high quality scientific references?
- Is the reference list made up of internet sites? You may use ONE government or association site, such as the American Diabetes Association/Heart and Stroke Foundation/Canadian Diabetes Association, for statistical purposes or prevalence rates only.
- Do the chosen references contribute to the quality of the text or are they chosen primarily as "fillers"?
- Does the author use "class notes" as references? (NO)

Presentation of references (/5):

- Are the references well used and varied in text? Please do not offer "secondary citations" or a constant repeat of the same reference.
- Are references properly presented?
    - YES: Winners of races most often wear the colour red to competition (Smits et al., 2007).
    - NO: Winners of races most often wear the colour red to competition[1].
- Are main concepts/findings of referenced summarized or merely quoted?

Content of paper (/30):

- Does the author adequately explore area of topic?
- Does the author adequately answer main question of paper?
- Does the author provide contrasting view points, if appropriate?
- Does the author provide adequate background to topic, if appropriate?
- Does the author offer own insight into/interpretation of /analysis of topic?

Spelling and grammar (/5):

- Please use spell check and make sure that words are used in proper context (ie: their/there or its/it's).
- Please be careful with grammar (incomplete sentences, run on sentences).
- Please use scientific language and not lay language.

Originality (/5):

- Does author seem to have put thought into development of topic?
- Does author "own" work?

List of example review topics for final paper

1- Overtraining – Mechanisms and strategies for prevention
2- Neuromuscular fatigue and exercise
3- Central nervous system fatigue and exercise fatigue
4- Anabolic steroids and exercise
5- Creatine supplementation and performance
6- Health benefits of exercise in special populations (targeted therapies)
7- Blood lipids and exercise
8- Endothelial function and exercise
9- Immune system function and exercise
10- Exercise and cancer (be more specific within area)
11- Exercise and cardiac hypertrophy
12- Muscle fiber type and the effects of exercise
13- Exercise, hematology, blood doping and endurance performance
14- Altitude, physiological consequences, training and performance
15- Exercise, body composition and weight loss
16- Exercise and blood lactate
17- Exercise metabolism; acute and chronic responses
18- Exercise, cognition, mental function and psychological health
19- Exercise, bone and osteoporosis
20-Exercise and gastrointestinal function
21- Physiological effects of exercise on the brain
22- Exercise and free radicals
23- Physiological basis of female athlete triad
24- Exercise and sex differences
25- Exercise and thermoregulation
26- Exercise and the effects of aging
27- Exercise and motor unit recruitment
28- Exercise, diet and longevity
29- Exercise, diet and gene regulation
30- Exercise and protein synthesis
31-Dietary supplements and exercise performance
32-Exercise and amino acid supplements
33-Strength Training and Endurance performance
34-Exercise and coronary heart disease
35- Exercise in the elderly population

*If there is another topic that interests you, please review with course instructor.