Instructor: Dr. B. R. MacIntosh  Office: KN B 306  Phone: 220 3431.  e-mail: brian@kin.ucalgary.ca.  Note: access to office (KN B 306), is from 8:30 - 4:30

Class Times:  Tuesday and Thursday  9:30 - 10:45  Rm KN B 133
Office Hours:  Tuesday and Thursday  10:50 - 11:45 or as arranged,  Rm  KN B 306  
Course Description: In this course, the principles of training and physiological factors affecting performance will be studied with consideration for the scientific basis of experimental evidence.

Prerequisite: Students taking this course must have already taken Exercise Physiology  (KNES 473). Biochemistry of Life Processes (BCEM 341) is also a prerequisite (or corequisite).

Objectives: In taking this course, the student will have an opportunity to review the physiological principles that are critical to athletic performance, and extend the study of these principles to include the chronic adaptations that occur as a result of regular training practices. In particular, the student will learn to challenge practices that are founded in empirical knowledge, looking for experimental evidence to justify or dispute such practices. Specific objectives of the course are the following:

1. to review the physiological principles of athletic performance
2. to become familiar with current literature in the physiology of sport  
3. to learn how to critically evaluate the scientific literature
4. to formulate a working knowledge of physiological factors affecting athletic performance and the manner in which training can induce changes in these physiological systems
5. to recognize the limitations of our knowledge with respect to experimental evidence for factors affecting athletic performance and the scientific basis of training procedures.

Academic Accommodations Awareness Information: “It is a student’s responsibility to request academic accommodation. If you are a student with a disability who may require academic accommodation and have not registered with the Disability Resource Centre, please contact their office at 220-8237. Your academic accommodation letters should be provided to your instructor no later than fourteen (14) days after the commencement of this course. Students who have not registered with the Disability Resource Centre are not eligible for formal academic accommodation.”

Evaluation: Evaluation in this course will be based on classroom quizzes, midterm and final exams and two assignments. A minimum of five quizzes will be given, and your best five will count toward the 10% grade (2% each). These may or may not be announced, and will be based on current lecture material and reading assignments. The final exam will cover material studied since the midterm exam. The criteria for the assignments (2 article critiques) are given at the end of this course outline.

classroom quizzes: 10 %
midterm exam: 25 %  Feb 10
two article critiques: 1. 15 %  due: Feb 17 (automatic extension to Feb 17, but no longer)
                          2. 20%  due: Mar 31 (automatic extension to April 7, but don’t ask for any longer)
final exam: 30 %  scheduled by the registrar
Grading will be based on the following scheme:

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<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
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<tr>
<td>88 - 100 %</td>
<td>A+</td>
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<td>84 – 87.99 %</td>
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**RESOURCE MATERIAL**

Students are expected to have access to a good Exercise Physiology text like one of the ones listed below (or more recent edition). Furthermore, it is anticipated that students will consult the scientific literature. Examples of journals that may be useful for this information are listed below.

**RECOMMENDED TEXTS**


**SCIENTIFIC JOURNALS** *(some of these and many others are available on-line)*

- Medicine and Science in Sports and Exercise
- Journal of Applied Physiology (available on-line)
- European Journal of Applied Physiology (available on-line)
- Int. J. of Sports Medicine
- Can. J. Appl. Physiol. (formerly: Canadian Journal of Sport Sciences)
- and others…

Note: The Journal of Strength and Conditioning is not considered a rigorous journal. Exercise caution (critical thinking) when you use this journal as a reference source.

**READINGS:** The following Readings and Resource Material are on Reserve in the LRC (Kinesiology). Some of them are available on-line at: [http://www.kin.ucalgary.ca/courses/knes475/](http://www.kin.ucalgary.ca/courses/knes475/). Lecture notes will also be put on this web site, by noon of the day prior to the lecture. The articles are referred to below in the list of topics to be covered by the author’s last name, and the year in which they were published. You are expected to read each article **prior to the class** in which it will be discussed. In some cases, two articles are listed. In these cases, the second one is provided as supplemental reading, because it will improve your ability to comprehend the primary article. Each day that a quiz is given, the quiz may be on last day’s class, or on the (primary) reading assignment for that day.


LECTURE TOPICS/SCHEDULE
Jan 11 Introduction: Nature of the course, and the sources of scientific information
Jan 13 Physiological determinants of athletic performance (strength, power, energy, endurance) (Sport Science Exchange: Roundtable, 1993.)
Jan 18 How to Critique a scientific paper: (critically read Tegtbur et al., 1993)
Jan 20 Continue
Jan 25 Continue
Jan 27 Efficiency and fibre types: (Coyle et al., 1992)
Feb 1 Continue
Feb 3 Physiological determinants of triathlon performance (Schabot et al., 2000)
Feb 8 Continue
Feb 10 midterm exam
Feb 15 Cross-country skiing in Finland (Rusko, 1992)
Feb 17 Continue 1st critique due
Mar 1 Combined aerobic & anaerobic (Bishop et al., 1998)
Mar 3 Continue
Mar 8 What does the oxygen deficit tell us? (Buck and McNaughton, 1999)
Mar 10 Continue
Mar 15 Fiber type and optimal velocity (Hautier et al., 1996)
Mar 17 Continue
Mar 22 Energetics of athletic performance (Capelli et al. ‘98)
Mar 24 Continue
Mar 29 Sprint training (Aagaard et al., 2000)
Mar 31 Continue 2nd critique due
Apr 5 Physiological determinants of success in rowing (Ingham et al., 2002)
Apr 7 Continue
Apr 12 Creatine supplements and training for rowing (Syrotuik et al., 2001)
Apr 14 Continue
CRITIQUE

As part of the requirements for this course, you must critically evaluate 2 research papers. To write a critique, you are evaluating several aspects of the paper, and the following guidelines should help. (adapted from Thomas and Nelson, 1990). The length of your critique can be no longer than 10 pages, excluding title page, abstract, figures and references. Use these titles to organize your paper!

A. Overall (most important)
   1. Is the paper a significant contribution to knowledge about the area?

B. Introduction and Review of Literature
   1. Is the research plan developed within a reasonable theoretical framework?
   2. Is current and relevant research cited and properly interpreted?
   3. Is the statement of the problem clear, concise, testable, and derived from the theory and research reviewed?

C. Method
   1. Are relevant subject characteristics described and are the subjects appropriate for the research?
   2. Is the instrumentation appropriate?
   3. Are testing/treatment procedures described in sufficient detail?
   4. Are statistical analyses and research design sufficient?

D. Results
   1. Do the results evaluate the stated problem?
   2. Is the presentation of results complete?
   3. Are the tables and figures appropriate, and without redundancy?

E. Discussion
   1. Are the results discussed?
   2. Are the results related back to the problem, theory, and previous findings?
   3. Is there excessive speculation?
   4. Is external validity appropriately adhered to?

F. References
   1. Are all references in the correct format and are they complete?
   2. Are the results related back to the problem, theory, and previous findings?
   3. Are all dates in the references correct and do they match the text citations?

G. Abstract
   1. Does the abstract include: a statement of the purpose, description of subjects, instrumentation, and procedures, and a report of meaningful findings?
   2. Is the abstract the proper length?

H. General
   1. Are key words provided?
   2. Does the paper provide for use of nonsexist language, protection of human subjects, and appropriate labeling of human subjects?

Plagiarism: Any submitted work must be your own. Copying from published sources (web or print versions) or other students is not acceptable. “A single offence of cheating, plagiarism, or other academic misconduct is a serious act that will not be tolerated in the Faculty of Kinesiology. Penalties for such acts will be determined by the Dean and may result in a failing grade, probation, suspension, or expulsion. Any student who is uncertain if an action falls into this category should consult the instructor and/or the calendar. See pages 53-56 of the calendar for more information.” (source: memo from Associate Dean, Academic, June 3, 2000). See: http://quarles.unbc.edu/lsc/rpplagia.html
For your first critique, you will evaluate one of the following papers (I would suggest that you read both of them):


For your second critique, you will evaluate one of the following papers:


FORMAT OF SUBMITTED WORK: (see: www.humankinetics.com/products/journals/submissions.cfm?jid=CJAP)

The description of format for submitted work has been extracted, (with only minor modifications), from the Canadian Journal of Applied Physiology Instructions for Authors (available at above web site). It is highly recommended that you consult examples from this journal before you submit your work. Examples from former students may not be appropriate. One major exception to the format of the journal is that you are not required to organize your critique in the sections typically seen in a scientific paper (Introduction, Methods, Results and Discussion). You will be required to have an abstract, which will be a summary of your paper. You will also be required to have an Introduction, which will provide the reader with the background necessary to understand what you have written, and why. After the Introduction, any subheadings will be up to you, but may reflect different aspects of the critique. It is recommended that you follow the headings used by Thomas and Nelson (1990) and presented above (alphabetical and numerical).

All parts of the submitted paper, including references, must be typewritten (12 point font), double spaced, on paper 8.5 x 11 in. with margins 2.4 cm (1 in.).

The first (Title) page should contain only the title of your paper, author's name, the course name and number, and the instructor's name. The title page, although not numbered, is considered to be page 1, and all remaining pages must be numbered in the top right-hand corner, beginning with the abstract, as page two. Your critique cannot be more than 10 pages, excluding title page, abstract, figures and references. Therefore, your last text page should be # 12. References, Tables and Figures follow this.

Spelling should follow that of either the Shorter Oxford English Dictionary or Webster's Third New International Dictionary. Use your computer spell-check! Abbreviations and Symbols for units of measure should conform to international recommendations. Metric or S.I. units should be used or equivalents given.

Abbreviations and contractions of the names of substances, procedures, etc. must be defined the first time that they are used. Symbols and Greek letters should be written clearly (if necessary). Superscripts and subscripts should be appropriately placed, and should be explained by marginal notes when necessary.
Titles are to have no more than 85 characters, including spaces between words. A short running title of no more than thirty (30) characters may be used. The running title should be placed as a header on each page after the title page.

An abstract is required. It should not exceed 200 words (use the word count function). It must be suitable for use by abstracting journals, e.g. Biological Abstracts, without rewording. Following each abstract, provide up to five (5) key words or phrases, which are not included in the title. The abstract and key words constitute page two of the report. See if you can improve on the key words provided by the authors of the paper you are critiquing.

Tables (if needed) should be numbered consecutively, using Arabic numerals. They should be typed with double-spacing and placed in the appropriate place within the body of the paper. Presentation of mean values should be accompanied by measures of dispersion (i.e. ± SEM). Vertical rules (lines) must be avoided. Figures should be numbered consecutively with Arabic numerals. Each figure can be placed at the appropriate position in the paper, or all of them can be placed sequentially at the back of the paper, after the Tables. Figure captions should accompany each figure, or the captions can be presented in an accumulated fashion immediately prior to the figures. Each caption gives a brief description of the figure contents, and provides descriptive information required for interpretation of the contents of the figure.

References within the text must follow Physiology Society format, e.g. (Smith, 1978). If the reference has more than two authors, only the first is named; this is followed by et al., e.g. (Quinn et al., 1964). You should limit the number of citations at any point in the text to three items (e.g. A review of the literature (Jones, 1932; Tino, 1977a; Maybee and Orr, 1956) reveals that ...). Depending upon the construction of the sentence, the names may or may not be placed in parentheses, but the year always is. If there is more than one publication by the same author in any one year, references should be distinguished by a, b, c, etc. after the year (e.g. MacIntosh, 1993a).

The reference list should be placed at the end of the text (before the Tables and Figures). Citations should appear in alphabetical order, according to the surnames of the first authors. In each citation, the surname of the other authors should follow. Initials should follow the surnames throughout. The citations should then give in order: year, title of the paper, name of the periodical (bolded and written in full or abbreviated according to Chemical Abstracts), volume, and inclusive page numbers. Reports not yet accepted for publication and private communications must be placed in parentheses in the text. No foot-notes are to be used in the text.

Examples of the correct reference format are presented above in your reading list.