EDKP 446 Physical Activity and Aging; Winter 2012

Instructor
Dr. Russ Hepple
Office: Currie Gym rm 204
Phone: 514 934-1934, 35509 (no voicemail)
Email: russell.hepple@mcgill.ca

Class Schedule
Room Education Bld rm 437
Times: T,Th 8:35-9:55 am
Dates: Jan 10-April 5, 2012
Office Hours: By appointment

Course Objectives:

1. Gain an understanding of current theories about the cellular basis of aging.
2. Gain an understanding of the physiological basis for declining capacity for physical activity with aging and the extent to which this is an obligatory result of cellular aging processes.
3. Gain an understanding of the role that physical activity plays in preventing age-associated disease and attenuating the decline in physiological function.
4. Gain an appreciation for the interaction between aging, age-associated disease and physical activity. For example, the capacity for physical activity declines with advancing age and many disease states; however, changes in the capacity for/amount of physical activity can be both an effect (e.g., reduced capacity due to aging/disease) and a cause (e.g., reduced amount of physical activity as a risk-factor for cardiovascular disease) of declining physiological function with aging and disease.
5. Gain an appreciation for critically analyzing the published scientific literature, including gaining an understanding of the relationships between hypothesis development, hypothesis testing through experimentation, and drawing logical conclusions from experimental results.

Prerequisites:
EDKP 395 Exercise Physiology

Important Dates and Evaluation:

Midterm 1 -	Tues. Feb. 7, 2012	30%
Quizzes on course readings	4 throughout term (4 x 2%)	8%
Reading Week –	Feb. 20-24, 2012	
Hand-in questions	9 throughout term (1 x 2%; 8 x 2.5%)	22%
Final Exam –	Scheduled by Registrar (TBA)	40%
		100%

Resource Materials:

a) Course notes.
b) Mandatory: Course pack containing selected readings from the current literature.
c) A good basic human physiology textbook.
d) A recent exercise physiology textbook, such as: Exercise Physiology. Energy, Nutrtion, and Human Performance. William D. McArdle, Frank I. Katch and Victor L. Katch. Lippincott, Williams and Wilkins.

Grading Scheme

Grades	Grade Points	Numerical Scale
A	4.0	85-100%
A-	3.7	80-84%
B+	3.3	75-79%
B	3.0	70-74%
B-	2.7	65-69%
F (fail)	0	0-64%

SPECIAL NOTES:

1. Contacting the Instructor: Students requiring assistance are encouraged to speak with their instructor during class. Should you wish to meet with the instructor outside of class, please phone or email the instructor to make an appointment. While email is commonly used by students to communicate with their instructor, it does limit the effectiveness and efficiency of the communications and may not be the best way for instructors to answer student questions, especially those requiring an explanation of concepts covered in this course or some personal concerns. Therefore, the instructor may request a telephone call or personal meeting. Your instructor will inform you about his/her expectations concerning emails.
2. 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 http://www.mcgill.ca/integrity/ **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/).
3. 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).
4. Internet and Electronic Communication Device Information: Any surfing of the Internet during lectures that is not directly related to the class discussion is distracting and strictly forbidden. Additionally, the use of any electronic devices (e.g., cellular phones, Smart Phones) for e-mailing, texting, etc. is strictly prohibited in classrooms. Please turn OFF your phone before the beginning of each lecture.

Quizzes:

1. Jan 17th on papers (2) by Hornsby and Peeper discussing cellular senescence and tissue aging.
2. Jan 19th on paper by Tuma. The two faces of oxygen.
3. Feb 2nd on paper by Masoro. Subfield history: caloric restriction, slowing aging, and extending life.
4. Feb 14th on paper by Hepple. Sarcopenia: A Critical Perspective.

Hand-in Assignments:

A. Jan 24th: How does aging affect the transcriptional profile and what does this suggest about the causes of aging in flies, mice and men? Refer to the paper by Zahn et al., 2006 in the course pack. For this assignment, answer the above question in a brief paragraph referring to the pattern of changes in the transcriptional profile in different tissues and species, which pattern was common between tissues and species, and what this latter finding tells us about the potential causes of aging. Hand in this assignment in class on Jan. 26th, 2012.
B. Following the midterm exam, most classes will center around one or more articles from the course pack and a question related to the reading ("Question of the Day"). Students need to read the paper or papers prior to the class and attend class to participate in a 'real-time' search for answers to the "Question of the Day". In reading over the paper(s) assigned to a given "Question of the Day", consider the following:
   (1) What is the research question being addressed?
   (2) What is the hypothesis being tested?
   (3) What methods are being used to test the hypothesis?
   (4) What were the main outcomes of the study?
   (5) Was the hypothesis confirmed or rejected?
   (6) Use the answers to the above to inform your answer to the "Question of the Day".

Each student will prepare and hand in at the start of the next class following a given "Question of the Day" discussion an answer to the "Question of the Day" based upon the papers provided in the course pack for that question, and based upon the in-class search and discussion. An example will be provided in class. Please bring these assignments to class. If you cannot attend a class to hand in an assignment, please email to Dr. Hepple at russell.hepple@mcgill.ca prior to class – assignments received after class will be considered late. Late assignments will incur a penalty: 1 day late = -20%, 2 days late = -40%. Papers received > 2 days after the specified due date will be marked as a zero (0).

Hand-in Questions after Midterm (hand in answers to any 8):

*Note: students are to read the relevant publications in the course pack prior to coming to class.

1. Feb 16th: Does oxidative stress increase or decrease the rate of aging?
   a. Paper: Lapointe et al. 2009
2. Mar 1st: What factors could contribute to an impaired distribution of cardiac output to skeletal muscle with aging?
   a. Papers: Proctor et al. 1998; Musch et al. 2004
3. Mar 6th: What factors could contribute to reduce cardiac stroke volume with aging and how does this progress from middle age to senescence?
   a. Paper: Wanagat et al., 2002

4. Mar 8th: Does aging affect fast twitch muscle to a greater extent than slow twitch muscle?
    a. Carter et al., 2010
5. Mar 13th: What is the impact of aging on muscle capillarity?
    a. Mathieu-Costello et al., 2005
6. Mar 20th: Describe the changes in mitochondrial function in aged skeletal muscle and how this might impact its structure and function.
    a. Papers: Chabi et al., 2008; Picard, Ritchie et al. 2010
7. Mar 27th: Is exercise training a cure for aging?
    a. Safdar et al., 2011
8. Mar 29th: How does life long exercise affect life span and disability?
    a. Paper: Chakravarthy et al. 2008
9. Apr 3rd: How might poor lifestyle exacerbate aging?
    a. Paper: Valdes et al., 2005