York University
Kinesiology and Health Science
Advanced Exercise Physiology: Muscle
***Winter 2019***
**KINE 4440 3.0**

## Objectives of the Course

To further an understanding of selected, current and advanced topics in muscle exercise physiology through **1)** lectures and **2)** the reading and discussion of current research literature.

The topics covered in this course will be devoted to skeletal muscle. They will include: 1) gene expression and adaptation in response to acute exercise and recovery, as well as chronic muscle use (resistance and endurance training) and disuse, 2) mitochondrial biogenesis, 3) fiber types, 4) the neuromuscular junction and E-C coupling, 5) aspects of fatigue, 6) carbohydrate and lipid metabolism, and 7) aging and disease. The course emphasizes the cellular and molecular basis of physiology in these areas.

**Skills to develop:**

1. Learning about muscle and the topics described above
2. Developing enhanced science presentation skills
3. Analyzing original research papers critically
4. Asking questions of your peers, without being too superficial or too lengthy
5. Moving to the highest level of undergraduate education
6. Using powerpoint effectively to transmit scientific information

**Required References:** Course notebook and papers
Additional references which can be helpful are on reserve in the Steacie Library

**Prerequisite:** KINE 4010 3.0 (Exercise Physiology) or equivalent.
**Lectures:** Mon/Wed 2:30-3:45
**Instructor:** **David A. Hood, Ph.D.** (Course Director)
Rm. 302 Farquharson, ext. 66640
**E-mail: dhood@yorku.ca**

**Teaching Assistant:** **Avi Erlich**
Rm. 302 Farquharson
**E-mail: avi.erlich22@gmail.com**

**STUDENT EVALUATION**

| | |
|---|---|
| Quiz # 1 | 15% |
| Quiz # 2 | 20% |
| Discussion topic | 20% |
| Paper presentation | 20% |
| Final Exam | 25% |
| TOTAL | 100% |

**If you miss a Quiz, you must provide appropriate documentation to avoid a grade of 0. Make-up quizzes will be held during the final exam period time, along with the final exam. The final exam will be 1½ hours in length.**

**Explanation of Assignments**

1. **Quizzes / final exam:** - will be of the short-answer question variety. Quizzes will be 45 minutes in length. This means sentences, diagrams, graphs, fill-in types of questions. No long essay questions. Expect "thinking" questions, not just direct recall of the material presented. The Quizzes will **not** be cumulative. Material covered in the **Discussion Topics** will be evaluated in Quiz # 1. Attendance at all quizzes is mandatory.

2. **Discussion topics: --** A list of discussion topics will be circulated in class. You and your group members will be assigned a topic and you must teach the class about it in a manner which is relevant to muscle physiology and health over no more than 20 minutes (followed by 5-10 minutes for questions). The presentation must be done in Powerpoint. There are 3 parts to the project: **1)** a drawn powerpoint illustration (5%); **2)** an explanatory figure legend (at least ½ page, with references) describing the figure and its relevance to the topic (5%); and **3)** the presentation itself (10%). You must provide the class and the course director with a single page handout (one side: illustration, other side figure legend). You are expected to refer to the

course kit where appropriate, but to document at least 3 scientific journal resources (not general internet sites or textbooks) as sources of information. I expect you to draw the illustration yourself based on the references you provide (not cut and paste it from the source). You will be assessed on the **quality** of each aspect of the project: organization, clarity, drawing complexity, apparent effort, ability to teach the class about the topic, and its relevance to Muscle health. **All members of the group will receive the same grade and all are expected to contribute equally, and attend the presentation.**

3. **Paper presentation:**-- your group will present the Introduction, Methods, Results and Discussion of an assigned paper in detail over about 20 minutes, using a Powerpoint format. All members of the group are expected to participate verbally, and all will get the same grade, provided all are in attendance. Questions of, and discussion with, the group members will be interjected or will follow the presentation (5-10 mins). The presenting group must supply the class with a 1 page (single-sided) outline of the paper with the following items:

**a)** Title of the paper and reference along with the names of the presenters in the group; **b)** Rationale for the study (i.e. why did they do it); **c)** Experimental design (eg. T vs. UT subjects, animals, general protocol employed and list of main items measured); **d)** Main results; **e)** Main discussion points; **f)** Summary of what we as a class should learn from this paper (in no more than 5 points).

Your group **grade** will be based on your organization, clarity, completeness (i.e. did you hit the main/important points?), your ability to teach the class about the main take-home points of the paper, the quality of your handout, and your ability to answer questions. Equal participation among group members is expected.

Marks will be deducted from your group paper presentation (5%) if you do not attend, and be on time for, the presentations of your colleagues. Attendance will be taken at 2:30 pm on the presentation day.

| WEEK # | *Mon* | Tues | *Wed* | Comments |
|---|---|---|---|---|
| 2 | Jan 7<br>**Introduction** | | 9 | |
| 3 | 14 | | 16 | |
| 4 | 21 | | 23<br>**Disc Topics** | |
| 5 | 28<br>**Disc Topics** | | 30<br>**Disc Topics** | Last day to enrol with permission is Feb.1 |
| 6 | Feb 4 | | 6<br>**Quiz #1** | |
| 7 | 11 | | 13 | |
| 8 | 18 | | 20 | Reading Week |
| 9 | 25 | | 27 | |
| 10 | 4 | | 6 | |
| 11 | 11<br>**Quiz #2** | | 13<br>**Lab Day** | Last day to drop without receiving a grade is Mar 8 |
| 12 | 18 | | 20 | |
| 13 | 25 | | 27<br>**Papers** | |
| 14 | Apr 1<br>**Papers** | | 3<br>**Papers** | |