

York University
Kinesiology and Health Science
Advanced Exercise Physiology: Muscle
Winter 2023
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) carbohydrate and lipid metabolism, and 6) aging and disease. The course emphasizes the cellular and molecular basis of physiology in these areas.

Many skills are developed by taking this course that will hopefully help you now and in the future:

1. Learning about mitochondria and metabolism and the topics described above
2. Developing enhanced presentation skills
3. Analyzing original research papers critically
4. Using powerpoint effectively to transmit scientific information
5. Moving effectively to the highest level of undergraduate education

Required References: The **hard-copy Course Kit** is required and available on the shelf in the Bookstore. The course kit contains all of the lecture images presented, unless otherwise noted. Papers for discussion will be available on **eClass** for your download.

Prerequisite: This course is meant for students who have completed at least 3 years of undergraduate study in KHS (i.e. 4th year Kine students). The minimum prerequisite requirement is Kine 4010 3.0 (Exercise Physiology) or equivalent. If you were enrolled in 4010 in Fall 2022 or earlier, you are eligible to take the course. If you do not have these requirements, you should speak to the course director on the first day of class so that you understand the expectations of the course.

Lectures: Monday 2:30-3:45 pm (75 mins), **Stedman E**
Wednesday: 2:30-3:45 (75 mins), **Room 1016 VP Dahdaleh**

The lectures will **not** be recorded using University-based recording systems. However, you are welcome to record the lectures with your own device, for your own purposes. Attendance at the in-person lectures is vital for success in this course. There are also a number of presentations that must be done in person.

Office Hours: Questions can be answered after every class, or via the Kine 4440 Zoom link provided for such purposes.

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STUDENT EVALUATION

Discussion topic presentation and diagram	15%
Quiz # 1 (On Mon. Feb. 13 , covering Jan 9-Feb. 8)	20%
Quiz # 2 (On Mon Mar. 13 , covering Jan 30-Mar. 8)	20%
Final Quiz (Exam period, covering Mar. 15-Apr. 10)	25%
Paper presentation	20%

TOTAL	100

Explanation of Assignments

1. **Quizzes / final exam:** - will be of the short-answer question variety. Quizzes will be 45 minutes in length. You may be required to write sentences, draw diagrams or graphs, and fill-in blank spaces with specific answers. No long essay questions will be asked. 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. **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 (also, not cumulative, and of the same format).**

2. **Discussion topics:** -- A list of discussion topics will be posted. 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” in Health and Disease over no more than 15 minutes (followed by 10 minutes for questions). The presentation must be done in Powerpoint. You can use 10-12 slides for your presentation, but you must draw the main explanatory figure of your topic using Powerpoint drawing tools. There are 3 parts to the project: **1)** the main powerpoint illustration; **2)** an explanatory figure legend using proper sentences (not point form; at least ½ page with >3 references) describing the figure and its relevance to the topic (7.5% for both); and **3)** the presentation itself and answers to questions (7.5%).

Hand-in requirements: 1) the complete PPT presentation to the CD/TA prior to the start of class for grading; 2) a 2-slide PPT presentation of the main figure and figure legend to the CD/TA for distribution to the class for review purposes. You are expected to use and document at least 3 scientific journal resources (not general internet sites or textbooks) as sources of information. You will be assessed on the **quality** of each aspect of the project: organization, clarity, timing of the presentation, drawing complexity, apparent effort, ability to teach the class about the topic, and its relevance to Muscle. **All members of the group will receive the same grade and all are expected to contribute equally. A statement of equal participation must be printed on the handout, and it must be labelled with all group members full names. If you miss the presentation of your group, you get 0 for the assignment.**

3. **Paper presentation:**-- An original literature scientific paper will be assigned to your group. You will present the Introduction, Methods, Results and Discussion of the paper in detail over 15 minutes, using a Powerpoint format. All members of the group are expected to participate verbally, and all will get the same grade. Questions of, and discussion with, the group members will be interjected or will follow the presentation (10 mins).

Hand-in requirements: 1) the complete PPT presentation prior to class for grading, 2) the presenting group must supply the class with a 1 page (single-sided, 12 pt font) study page 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 the 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?), timing of your presentation, 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, and a statement as above must be typed on the handout.

Please note that 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 each presentation day.

Lecture and Exam Schedule: KINE 4440 3.0 (Winter 2023)

Week #	Mon	Wed	Comments
1	Jan 9 Introduction	11	Disc topics assigned by Friday
2	16	18	
3	23	25 Disc Topics	
4	30	Feb 1 Disc Topics	
5	6 Disc Topics	8 Integration of Disc Topics	
6	13 Quiz # 1	15	
7	20	22	Reading Week
8	27	Mar 1	
9	6	8	Last day to drop without receiving a grade is Mar 17
10	13 Quiz # 2	15	Paper assigned by Friday
11	20	22	Lab Day will be scheduled this week
12	27 Papers	29	
13	April 3	5 Papers	
14	10 Papers		