Advanced Human Physiology: Endocrinology
KINE 4448 3.0-Winter 2016

Course Director: Michael C. Riddell, PhD

Objectives of the Course:
The objective of this course is to enhance our understanding of the main endocrine systems regulating growth, metabolism, calcium levels, water balance and reproduction. The method of learning will include discussions in current and advanced topics in endocrinology through **1)** seminar style lectures **2)** student presentations, and **3)** group discussion of current research literature.

This course provides an overview of human endocrinology as it relates to human health and disease. The various hormone systems are considered from physiological, biochemical and molecular perspectives. The topics covered include: the mechanism of action of peptide hormones, steroids and thyroid hormones, second messenger systems, autocrine effects of growth factors, endocrine functions of the hypothalamus, posterior and anterior pituitary hormones, adrenal glucocorticoids and mineralocorticoids, the renin-angiotensin system, thyroid hormones, insulin, glucagon and glucose homeostasis, hormones regulating calcium balance, and male and female reproductive physiology. Emphasis is placed on health and disease processes, as well as adaptations during exercise. Discussion of original research articles is included. The course emphasizes the physiological, cellular and molecular basis of the endocrine systems.

Recommended Text:

Molina, P.E. Endocrine Physiology, 3rd or 4th editions (Lange McGraw Hill).

Instructor: Michael C. Riddell, Ph.D., Rm. 225B Lumbers Building, E-mail: mriddell@yorku.ca
Lectures: Tues/Thurs 2:30-4:00, CC 106

Office Hours: Mondays and Wed 10:30-12noon (Lumbers 225B)

Student Evaluation:

Presentation 1 (group):	15%
First Exam:	25%
Presentation 2 (group):	25%
Final Exam:	35%
TOTAL:	**100%**

Important dates and tentative schedule:

Tues	Thurs
Jan 5-Introduction	Jan 7-General Principles of Endocrinology
Jan 12-General Principles of Endocrinology	Jan 14- Hypothalamus and Post. Pituitary
Jan 19-Hypothalamus and Post. Pituitary	Jan 21- Anterior Pituitary gland
Jan 26- Anterior Pituitary gland	Jan 28- Thyroid gland
Feb 2-(online lecture)	Feb 4- (online lecture)
Feb 9-Groups 1-4 present	Feb 11-Groups 5-8 present
Feb 16-Reading week	Feb 18-Reading week
Feb 22-Groups 9-12 present	Feb 25- Groups 13-16 present
March 1st **Midterm exam**	March 3rd Parathyroid gland and Ca^{2+} & PO_4^- regulation
March 8th Adrenal Gland	March 10th Endocrine Pancreas
March 15th-Integrative Endocrinology of Metabolism	March 17th - Exercise Endocrinology
March 22nd - Reproductive Endocrinology	March 24th - Groups 1-3
March 29th Groups 4-7	March 31st - Groups 8-11

Note: Last day to drop a course without receiving a grade is March 4th

Explanation of Assignments:

- **Exams: Both the midterm and final exam will have** multiple choice questions and problem based case studies (exams will be 80-90 minutes in length). Often, the interpretation of graphs or diagrams similar to what is discussed in class will be required. The exams are **not** cumulative. Material covered in the **Discussion Topics** by students will be evaluated in Exam 1. **Paper discussions** will be covered by Exam 2. **Make-up exams:** will be of the Essay question type. Legitimate documentation must be presented.

- **Presentation 1: Group Discussion of an image or figure (ONE PAGER)**-- A list of "clinically relevant discussion topics" will be provided. You and your group members (2-3 more persons) will be assigned a topic. There are 3 parts to the project: **1)** a ONE SLIDE PowerPoint illustration of the topic (5%); **2)** an explanatory figure legend describing the figure and its relevance to the topic (5%); and **3)** the oral presentation of your topic (5%). You must provide the course director with a single page handout (that includes the illustration and a figure description) and a pdf of the hand-out to put on Moodle and you must present your topic to the class in no more than 10 minutes (+ 2-3 minutes for questions). You are expected to use at least 3 journal resources (not general

internet sites or textbooks) as sources of information. The presentation must be done in PowerPoint and you are expected to create this illustration yourself based on the references you provide. The figure should be labelled as "Adapted from Authors name, Journal name, and year of publication. You will be assessed on the **quality** of each aspect of the project: organization, clarity, drawing detail, apparent effort, ability to teach the class about the topic, and its relevance to endocrinology. All members of the group will receive the same grade and all are expected to contribute equally, and attend the presentation. A statement to that effect, along with group member names must be on the handout.

- **Presentation 2: Paper presentations:** -- A relevant research paper will be assigned to you and your group members (total of 3-4 per group) by the instructor. You will present the Introduction, Methods, Results and Discussion in detail over about 20 minutes. Questions (5 mins) will be interjected or will follow the presentation. The whole class is responsible for the highlights of the presented information. The 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; **b)** Rationale for the study (i.e. why did they do it); **c)** Experimental design (eg. Clinical vs. control subjects or type of animal model used, general design and protocol employed with list of main parameters measured); **d) Key findings**; **e)** Summary of what the main findings and physiological relevance (i.e. what did we learn from this paper in 3-5 main bullets).

  Your **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, your ability to answer questions, and your ability to analyze the paper.