

**Advanced Human Physiology: Endocrinology
KINE 4448 3.0-Term Fall 2023 (Section A)**

Rooms:

Accolade Building West (ACW) Room 204 (Mondays 2:30-4pm)
Chemistry Building (BC) Room 129 (Wed 2:30-4pm)

Course Director/Instructor: Prof Michael C. Riddell, PhD

Welcome to KINE 4448!

Objectives of the Course:

The endocrine system is responsible for so much of our daily health and function. It has several roles to play in our minute-by-minute survival and capacity to grow and develop. It plays a key role in how we grow and age. It also plays a role, sometimes, in causing illness and death. The objective of this course is to enhance our understanding of the main endocrine systems regulating growth and repair, temperature regulation, stress responses, energy metabolism, bone turnover, water balance and reproduction. The method of learning will be in person lectures and discussions in current and advanced topics in endocrinology. Classes will be recorded.

The goal of this course is to provide an overview of human endocrinology as it relates to human health and disease. The various hormone systems are presented from a physiological, biochemical and molecular perspective. The topics covered include: general concepts of endocrine physiology the mechanism of action of hormones and their receptors, second messenger systems, steroids and thyroid hormones, 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, hormones regulating calcium balance, pancreatic hormones and energy homeostasis, 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.

Optional Text: Molina, P.E. Endocrine Physiology, 5th edition (Lange McGraw Hill) or any earlier edition you can get your hands or eyes on. This can be accessed online (for a fee) via a few suppliers such as [Access Medicine](#). You can also find older editions via other text distributors used such as triftbooks.

NOTE: Much of what is covered in class is found in this text but no material from it will be on any exam. You can do well (i.e., get an A+) in this course without securing this text.

Instructor: Michael C. Riddell, Ph.D., E-mail: mriddell@yorku.ca

Lectures:

In person Monday and Wednesdays in the scheduled time slots (2:30-4:00PM)
Lectures are recorded and posted on eclass

Mondays: Accolade Building West (ACW) Room 204 (Mondays 2:30-4pm)
Wednesdays: Chemistry Building (BC) Room 129 (Wed 2:30-4pm)

Student Evaluation:

Quiz 1	20%
Quiz 2	20%
Assignment	20% (due December 5th 2023 , by midnight uploaded to eclass)
Final Exam (cumulative)	40% (in the final exam period)
TOTAL:	100%

Important dates and tentative schedule:

Mondays	Wed
	Sept 6-Introduction
Sept 11-General Principles of Endocrine Physiology	Sept 13- General Principles of Endocrine Physiology
Sept 18- General Principles of Endocrine Physiology	Sept 20- Hypothalamus and Post. Pituitary
Sept 25- Hypothalamus and Post. Pituitary	Sept 27- Feeding and Pleasure
Oct 2- Quiz 1	Oct 4th- Anterior Pituitary gland (virtual lecture)
Oct 9 No class (reading week)	Oct 11 No Class (reading week)
Oct 16 - Anterior Pituitary gland	Oct 18-Anterior Pituitary gland - Pituitary disorders
Oct 23-Thyroid gland	Oct 25*- Thyroid gland disorders
Oct 30 - Parathyroid gland and Ca ²⁺ & PO ₄ ⁻ regulation	Nov 1- Adrenal gland
Nov 6 - Adrenal gland disorders	Nov 8- Endocrine Pancreas
Nov 13 – Diabetes (Type 2 pathophysiology)	Nov 15- Quiz 2
Nov 20- Diabetes (Type 2 treatments)	Nov 22-Diabetes (Type 1)
Nov 27- Integrated Endocrinology of Exercise	Nov 29- Reproductive Endo
Dec 4- Reproductive Endo (assignment due Dec 5th)	

Explanation of Exams and Assignments:

- **Exams: Both midterm quizzes and final exam will have** multiple choice questions and problem-based case studies (quizzes will be ~60 minutes in length, the final exam will be about 90 minutes). Often, the interpretation of graphs or diagrams like what is discussed in class will be required. The final exam is cumulative. Material found exclusively in the optional textbook is not considered examinable.
- **Missed Quizzes will be added to the final**
- **Assignment:** A few things I have noticed as a published researcher and educator is that A LOT OF STUFF IS PUBLISHED in the endocrinology field, sometimes in great journals and sometimes in lesser quality journals. It is impossible for me as a researcher to read everything in the stress, exercise and diabetes literature, the stuff that me and my lab team research, let alone all the other fascinating endocrinology research I enjoy learning about and teaching on in this class. The field of endocrinology is MASSIVE, sometimes contradictory, and ever changing (new pathways, new drugs, new diseases, new treatments). Many researchers and clinicians who are engaged in endocrine research and care now turn to online resources to "skim" the news on what is being published in the top endocrinology, physiology and specialized medical journals that publish studies on the endocrine system in health and disease. The role of the scientific medical writer is now in high demand and with your training as an undergraduate student, you will take on that role in this class! **Your task:** First, pick a research article recently published (within last 2-3 years) in an endocrine/physiology or clinical journal that stimulates your interest in endocrinology (must be an endocrine related paper). Produce a high-quality and detailed news release, with an image, that highlights the published journal article. Several examples can be found online, but make sure yours is original (I will look). Include elements such as background information on the topic of study, study purpose, study methods, main findings, and interpretation of the results as text, a visual abstract picture, limitations and future directions. Please do not choose a review paper. See an example on one of my more recent publications highlighted by Healio News ([Endocrine today](#)). Please make sure you put your name and student number on your

News Report. Other examples can be found by Healio Endocrinology News [here](#) and by the Endocrine Society [here](#). It can be [human](#) or [non-human](#) research profiled. **Your assignment grade will be based on relevance to our coursework (10%), content (20%), readability (20%), your interpretation of the research (40%) and style/visuals (10%).** To accommodate these requirements, **produce a "news story" consisting of 600-1000 words** and make sure you cite the original paper somewhere using a hyperlink. Other hyperlinks can be used sparingly, and you must create a unique *your own) summary visual (lots of examples online at various endocrine journals like Diabetes Care and Diabetologia (or follow Dr Daniel J Drucker on X to see a bunch!) since this often attracts attention on social media platforms such as Twitter to pull readers to your news story. You have the option to share your progress with me (I'm the one marking it so you might as well get some critical feedback) on or before March 3rd. Feedback after March 3rd is possible but will be less critical.

GOOD LUCK THIS TERM!