

BIOL 432 A01 (CRN 20403)
Molecular Endocrinology
Spring 2024
Department of Biology, University of Victoria
Tues/Wed/Fri 11:30 am - 12:20 pm
Elliott Building 167

Lectures will be **synchronous & in-person**.

We will use Brightspace as an additional resource during lectures and for exams.

Instructors: Dr. Nicole Templeman Email: nmtempleman@uvic.ca Office: Petch 053A
Dr. Patrick Walter Email: pwalter@uvic.ca Office: Cunn 217

Office Hours:

Please reach out to whichever instructor covered the material related to your questions.

Dr. Templeman: Petch 053A Mondays 11 am - 12 pm, Jan 8-Mar 11
or by appointment (email nmtempleman@uvic.ca, "BIOL 432" in subject line).

Dr. Walter: Cunn 217, Tues and Fri 10:30 am - 11:30 am or by appointment
(email pwalter@uvic.ca, "BIOL 432" in subject line).

Intended Learning Outcomes:

This is an introduction and survey course of general and contemporary endocrinology topics. Following this course, you should be able to describe how key aspects of our physiology, behavior, and health (including growth, energy balance, reproduction, and stress responses) are controlled by hormones. You should be able to demonstrate a grasp of the physiological consequences of hormone disruption/deregulation, and describe the pathologies behind major endocrine disorders.

You should also have a working understanding of:

- the key cells, tissues, and glands of the endocrine system
- the molecular bases for the synthesis, secretion, and transportation of major hormones
- the target cells/tissues, signal transduction pathways, and effects of major hormones
- how levels and actions of hormones & receptors are regulated, in healthy and disease states

In addition, you should be able to critically interpret scientific literature related to endocrinology.

Description from the UVic Calendar:

Units: 1.5, Hours: 3-0. Basic and molecular aspects of endocrinology. Brain hormones and their precursors, insulin and its receptor, gene-associated peptides, new glycoprotein hormones, growth factors, steroids, the superfamily of steroid and thyroid receptors, pheromones, oncogenes, and immunoendocrinology. Lectures and presentations of scientific papers.

Prerequisites: You must have completed one of: BIOL 360, 365, 305A, BIOC 299, 300A, 300B.

Brightspace:

We will use the university's Brightspace learning/teaching resource to post important course material, including **lecture notes, practice questions, assignments, lecture recordings, practice exams, exams, journal articles, and course announcements**.

Please check Brightspace regularly.

To access Brightspace, use your Netlink ID and password and log onto Brightspace from your MyPage area <https://www.uvic.ca/mypage/> OR directly: <http://bright.uvic.ca/>.

Lecture recordings:

Sessions in this course may be recorded, to allow students who need to miss a class due to illness, etc. to keep up with the material. **Please do not expect or rely on the recordings – there may be occasions when lecture recordings are not available.** The recordings are not intended as a study aid or replacement for prolonged in-person attendance. Classroom engagement is important for learning, and the practice question/participation portion of your grade requires your attendance.

Recordings will only be available in Brightspace for a maximum of 1 week after the lecture.

To access the recordings, you must click the '**Echo360 videos, Biol432**' link in the Lecture Videos module on Brightspace. It is necessary for you to enter Echo360 **using this link** the first time, to access the material. This link takes you to your Echo360 library/course within Brightspace, and there you can view the recordings. Please be aware that automated transcription and captioning is at best 70-90% accurate and by nature will include error. Students who have privacy concerns or questions regarding classroom recording and privacy, please contact privacyinfo@uvic.ca.

Course textbook (recommended):

Greenspan's Basic and Clinical Endocrinology by Gardner, D.G. and Shoback, D. 9th Edition. **This textbook is recommended, but not required.** This text is available in a digital format and is a medical text with extensive clinical information. We will **NOT** be covering all material in the textbook. **The primary source of information will be the lecture material covered in class.** Two copies of the 8th edition of the textbook are on reserve in the library.

Journal Articles:

Journal articles will be assigned, and some class time will be spent discussing them. We will assess your comprehension and critical interpretation of the journal articles and their data through take-home assignments containing multiple choice, fill in the blank, and/or short answer questions.

Course Evaluation:

19% - Review questions/participation

6% - Journal article assignments

35% - Midterm exam [Required]

40% - Final exam [Required]

19% Review questions/participation (on Brightspace, during lectures):

Practice questions and/or activities will be given via Brightspace "quiz" modules during lecture time, to review and test your understanding of the material on an ongoing and immediate basis.

14% for correctness on Brightspace review questions.

(calculated after dropping each individual's lowest ~5 quizzes)

5% for participation in Brightspace review questions.

(only given to those students who answer **>70%** of all questions through the semester).

35% Midterm exam – Wednesday February 14th

50 min online exam: in-class/in-person, closed book, on Brightspace. The midterm exam will be cumulative, and may be a mix of multiple choice, fill in the blanks, and short answer questions.

The midterm exam must be written to receive a final grade for the course.

40% Final exam - Date TBA, during the exam period between Tues Apr 11 – Wed Apr 26.

3-hour online exam: in-person, closed book, on Brightspace. The exam will build on concepts established before the midterm exam, but it will focus on previously untested material from after the midterm. The exam may be a mix of multiple choice, fill in the blanks, and short answer questions.

The final exam must be written to receive a final grade for the course.

Deferred final exams will be handled as outlined in the University of Victoria [academic calendar](#).

Students are expected to be present for the midterm and final exam on the dates specified. Students who cannot attend an exam due to illness/unexpected circumstances should notify us immediately.

Failure to write the midterm exam will result in a grade of 0% for the exam, unless for unexpected and unavoidable circumstances (e.g., illness, accident, or family affliction) or valid and documented conflicting responsibilities. Students who miss the midterm exam for one of the legitimate reasons listed above will have the opportunity to write a deferred exam within approximately ten business days of the midterm exam.

Failure to write the final exam will result in a grade of 0% for the exam, unless for unexpected and unavoidable circumstances (e.g., illness, accident, or family affliction) or valid and documented conflicting responsibilities. If there are unexpected & unavoidable circumstances or documented conflicting responsibilities (described further in the [academic calendar](#)) that cause a student to miss the final exam but the instructors have indicated that they will permit the exam to be written before the final grades are submitted, students must submit a [Request for In-course Extension form](#) to the instructors as early as possible. Students must submit a [Request for Academic Concession form](#) if the deferred final exam is to be completed after the final grades are submitted. **Policies regarding undergraduate student academic concessions also detailed in the [academic calendar](#).** Deferred final exams will be arranged by the instructor or the University. **Travel is not an acceptable reason to miss an exam or deferred exam date.**

~~~

The exams and assignments will test your ability to understand and explain complex concepts, and design or interpret experiments. Therefore, memorization of lecture handouts will not be sufficient. **You are expected to have completed 3<sup>rd</sup>-year Cell Biology and Biochemistry, and the onus is on you to review pertinent material as needed.** We also expect students to take notes during lectures. Copies of the slides will be provided on Brightspace, but these notes should not be considered to be complete; students are also responsible for material discussed during the lectures. For questions regarding lecture material, students should go to the instructor for that particular topic.

Students who have completed both the midterm and the final exam will be considered to have completed the course, and will be assigned a final grade. Failure to complete one or more of these elements will result in a grade of "N" regardless of the cumulative percentage on other elements of the course. An N is a failing grade, and it factors into a student's GPA as 0. The maximum percentage that can accompany an N on a student's transcript is 49. **Therefore, you must write both the midterm exam and the final exam to pass the course.**

**Your final overall mark in the course will be given as a percent based on the following guidelines: A+ = 90-100%, A = 85-89.9%, A- = 80-84.9%, B+ = 77-79.9%, B = 73-76.9%, B- = 70-72.9%, C+ = 65-69.9%, C = 60-64.9%, D = 50-59.9%, F = 0-49.9% (if all requirements completed), N = 0-49.9% (if not all requirements completed).**

#### **Student conduct & academic integrity:**

We support the university's commitment to promoting critical academic discourse while providing a respectful and supportive learning environment. All members of the university community have the right to this experience and the responsibility to help create such an environment. The university will not tolerate racism, sexualized violence, or any form of discrimination, bullying or harassment.

Please be advised that, by logging into UVic's learning systems or interacting with online resources and course-related communication platforms, you are engaging in a university activity. All interactions within this environment are subject to the university's expectations and policies. Any concerns about student conduct may be reviewed and responded to in accordance with the appropriate university policy. To report concerns about online student conduct, contact: [onlineconduct@uvic.ca](mailto:onlineconduct@uvic.ca).

Students are also required to abide by all academic regulations set as set out in the university calendar, including standards of academic integrity. **Violations of academic integrity (e.g. cheating and plagiarism) are considered serious and may result in significant penalties.** Submitted material must be your own work. The policy on academic integrity is here: [academic integrity policy](#).

### **Use of abbreviations and spelling expectations**

We use abbreviations in this course, as they are commonly used in scientific literature (and they save space in notes and on figures). In scientific literature, the proper use of an abbreviation requires it to be first fully defined. We aim to only use abbreviations after we have defined the term fully.

You are expected to know the full names of hormones, receptors, and important molecules that are defined for you (particularly the terms emphasized with purple text in the lecture notes). If you have defined the abbreviation within an exam question OR if an abbreviation is given in the text of question itself, you may use an abbreviation. Otherwise, please use full names. Half marks will be given for sole use of abbreviations, unless a particular question specifies that an abbreviation is acceptable.

Correct spelling is also important, but generally a single letter mistake will still receive full marks. However, please note that sometimes a single letter will change the meaning (e.g. tropic vs trophic), so spelling mistakes will be assessed on a case-by-case basis.

### **Copyright:**

All course content and materials are made available by instructors for educational purposes and for the exclusive use of students registered in their class [1]. The material is protected under copyright law, even if not marked with a ©. Any further use or distribution of materials to others requires the written permission of the instructor, except under fair dealing or another exception in the Copyright Act. Violations may result in disciplinary action under the [Resolution of Non-Academic Misconduct Allegations policy \(AC1300\)](#).

### **Support services:**

All of us benefit from support when we are struggling. If you need support, there are many different services on campus to help you. Please see any of the following:

Centre for Academic Communication <https://www.uvic.ca/learningandteaching/cac/>

Counselling Services <https://www.uvic.ca/services/counselling/>

Peer Support Centre <https://uvss.ca/peer-support-centre/>

Indigenous UVic Student Support <https://www.uvic.ca/services/indigenous/students/index.php>

Health & Wellness Services <https://www.uvic.ca/student-wellness/>

Meditation / Spiritual Health <https://www.uvic.ca/student-wellness/wellness-resources/spiritual-health/>

Library <https://www.uvic.ca/library/>

Ombudsperson <https://www.uvic.ca/universitysecretary/senate/appeals/ombudsperson/index.php>

Computer Help Desk <https://www.uvic.ca/systems/about/academic/helpdesk/index.php>

### **Centre for Accessible Learning:**

The University of Victoria is committed to creating a learning experience that is as accessible as possible. If you anticipate or experience any barriers to learning in this course, please feel welcome to discuss your concerns with us. If you have a disability or chronic health condition, or think you may have a disability, you may also want to meet with an advisor at the Centre for Accessible Learning (CAL). You can find more information about CAL here: <https://www.uvic.ca/services/cal/>

### **Territory acknowledgement:**

All instructors involved with Biol 432 acknowledge and respect the ləkʷəŋən peoples on whose traditional territory the university stands, and the Songhees, Esquimalt and WSÁNEĆ peoples whose historical relationships with the land continue to this day.

**Provisional Lecture Schedule 2024 (changes may be necessary)**

**SEMESTER STARTS MON JAN 8 AND ENDS MONDAY APR 8 2024**

**Week 1:**

1. Tues Jan 9. Introductions/Outline/Endocrine System Overview – Templeman, Walter
2. Wed Jan 10. Endocrine System Overview – Templeman
3. Fri Jan 12. Endocrine System Overview – Templeman

**Week 2:**

4. Tues Jan 16. Peptide Hormone Mechanisms & Biosynthesis – Templeman
5. Wed Jan 17. Peptide Hormone Mechanisms & Biosynthesis – Templeman
6. Fri Jan 19. Peptide Hormone Mechanisms & Biosynthesis – Templeman

**Jan 21 SUN Last day for 100% reduction of second-term fees if drop course**

**Week 3:**

7. Tues Jan 23. Surface Receptors – Walter
8. Wed Jan 24. Surface Receptors – Walter

**Jan 24 WED Last day for adding courses that begin in the second term**

9. Fri Jan 26. Hypothalamus and Pituitary – Walter

**Week 4:**

10. Tues Jan 30. Hypothalamus and Pituitary – Walter
11. Wed Jan 31. Growth Hormone, Growth Factors, and Growth-related Diseases – Templeman

**Jan 31 WED Last day for paying fees without penalty**

12. Fri Feb 2. Pancreatic Hormones: Insulin and Glucagon – Templeman

**Week 5:**

13. Tues Feb 6. Diabetes and Metabolic Syndrome – Templeman
14. Wed Feb 7. Endocrine Regulation of Energy Balance – Templeman
15. Fri Feb 9. Endocrine Regulation of Energy Balance [**Journal article 1**] – Templeman

**Feb 11 SUN Last day for 50% reduction of tuition fees for standard courses**

**Week 6:**

16. Tues Feb 13. Review for midterm exam – Templeman/Walter

**17. Wed Feb 14. Midterm exam (Templeman/Walter)**

18. Fri Feb 16. Thyroid Hormones – Templeman

**Week 7: Feb 19-23 Reading Break**

**Feb 18: Journal article assignment 1 due (no extensions)**

**Week 8:**

**Feb 27 TUES Last Day to Drop Courses without Failure**

19. Tues Feb 27. Non-genomic Actions of TH and TH Diseases - Nuclear Receptors and Apoptotic receptors - Introduction to Steroid Hormone Chemistry – Walter

20. Wed Feb 28. Introduction to Steroid Hormone Synthesis – Walter

21. Fri Mar 1. Reproductive Endocrinology – Templeman

**Week 9:**

22. Tues Mar 5. Reproductive Endocrinology – Templeman

23. Wed Mar 6. Reproductive Endocrinology – Templeman

24. Fri Mar 8. Glucocorticoid and Mineralocorticoid Hormones – Walter

**Week 10:**

25. Tues Mar 12. Glucocorticoid and Mineralocorticoid Hormones – Walter

26. Wed Mar 13. Glucocorticoid and Mineralocorticoid Hormones – Walter

27. Fri Mar 15. Guest Lecture, Sarah Jones (Cushing's Disease) – Adrenal Hormones and Catecholamines – Walter

**Week 11:**

- 28. Tues Mar 19. Adrenal Hormones and Catecholamines – **[Journal article 2]** – Low Melatonin, Increased Estrogen – the Environment and Breast Cancer – Walter
- 29. Wed Mar 20. PTH, Vitamin D and Calcitonin – Walter
- 30. Fri Mar 22. Calcium and Bone Disease – Walter

**Week 12:**

- 31. Tues Mar 26. Sex and gonadal differentiation – Walter
- 32. Wed Mar 27. Sex and gonadal differentiation – Walter; *Journal article assignment 2 due (no extensions)*

**Fri Mar 29: University Closed**

**Week 13:**

- 33. Tues Apr 2. Aging and Performance Enhancing Drugs – Walter/Adam Kreek – Walter
- 34. Wed Apr 3. Estrogen, Vitamin D, the Environment and Breast Cancer – Walter
- 35. **Fri Apr 5. Last Class.** Endocrine Autoimmunity and REVIEW – Walter

**EXAM PERIOD Tues Apr 11 – Wed Apr 26 (final exam date TBD)**