

USC Dornsife
College of Letters,
Arts and Sciences

HBIO407L – Endocrinology and Metabolism (4 units)

Spring 2024

Lectures: Tuesday/Thursday; 09:30-10:50 am

Location: THH 114

Labs: Monday, 11:00-01:50 pm; Wednesday, 11:00-01:50 pm;

Wednesday, 02:00-04:50 pm

Location: PED B12

•Instructor: Lorraine P. Turcotte, PhD, Professor (she/her/hers)

Office: AHF 247

Office Hours: Tuesdays, 11:30 am -1:00 pm & by appointment

Tuesday office hours: A sign-up sheet will be available at the front of the classroom for students who want to sign up for Tuesday office hour slots.

All office hours will be held in **AHF 251**.

Please be on time for office hours and wait outside the room in the waiting room.

By appointment: Special office hour appointments should be organized in advance via email correspondence with Dr. Turcotte. These office hours can be on Zoom or in person.

Contact Info: turcotte@usc.edu

I will respond to all emails within 48 hours either individually via email or as a group in class (if the topic is relevant for all students attending the class). For answers to complex questions, the student may be encouraged to schedule a visit during office hours.

•Instructor: Charles (Kiki) Crawford, PhD, Lecturer (he/him/his)

Office Location: PED 109

Office Hours: TBA

Contact Info: charles.crawford@usc.edu

•Lab Director: Anh-Khoi Nguyen, PhD (he/him/his)

Office: PEB 109

Office Hours: by appointment

Contact Info: agnguyen@usc.edu

I will respond to all emails within 48 hours via email.

•Lab Instructor: Bara Floyd, MS (she/her/hers)

Office: PED 109

Office hours: TBA

Contact Info: gbfloyd@usc.edu

I will respond to all emails within 48 hours either individually via email or as a group in class (if the topic is relevant for all students attending the class).

Lab Instructor: Lauren Visconti, MS

Office Location: PED 109

Office hours: TBA

Contact Info: lmv_967@usc.edu

Course Description

- This course will focus on the regulation of metabolic pathways and hormonally induced signaling pathways in health and metabolic diseases.
- This course has a capstone project and thus it is strongly recommended that students take the course in their senior year.

Learning Objectives

- to describe the structure and function of selected endocrine cells and tissues as well as the signaling pathways and biological actions induced by selected hormones.
- to relate the knowledge of endocrine hormones to pathological conditions such as obesity and type 2 diabetes.
- to analyze differences in hormone levels with different physiological, nutritional and pathophysiological conditions and correlate changes in hormone levels with the development of clinical symptoms.
- to compile, analyze, synthesize and criticize primary research articles and prior knowledge obtained in earlier classes to formulate a testable hypothesis associated with independent research project.
- to design experiments, safely use the scientific equipment necessary to collect the data, statistically analyze the results, present and interpret the results, and respond to questions about the experiments and results
- to recommend ways by which dietary and physical activity interventions would help to reduce the rates of obesity and type 2 diabetes in different socioeconomic settings.
- to discover and discuss the impact of human diversity as manifested by age, disability, gender, ethnicity and social status on the development of endocrine pathologies.

Prerequisite(s): HBIO 302L

Technological proficiency and Hardware/Software required

- Because the possibility always exists that we will have to go back to virtual classes, you should have an **internet-enabled device** with browser capabilities, such as a tablet or laptop/desktop computer.
- This course requires the use of **Blackboard** whether the class will be in person or virtual. Blackboard will be your gateway to access Zoom (if we have to give lectures virtually) and to view your grades. Blackboard will also be the repository of lecture slides and lectures on Zoom if we go virtual. If classes go online, students will need to download **Respondus Lockdown Browser** to take all scheduled exams. Information for these resources can be found at the ITS Customer Support Center: <https://itservices.usc.edu/contact/> and <https://blackboardhelp.usc.edu/>.
- This course also requires the use of Microsoft Word, Excel and Powerpoint.
- **USC Technology Rental Program** (<https://itservices.usc.edu/spaces/laptoploaner/>): Students who are in need of resources to participate in this class can apply to the university's equipment rental program. The **Student**

Basic Needs team will work with you to distribute equipment (if you are eligible). Please visit <https://studentbasicneeds.usc.edu/resources/technology-assistance/> to apply and for more information.

Required Readings and Supplementary Materials

- 1) **Essential Endocrinology and Diabetes.** 7th edition. Holt, R.I.G. and Hanley, Wiley Blackwell Publishing, Hoboken, NJ, 2021.

This book is available on Amazon as an ebook or paperback (\$40-52): https://www.amazon.com/Essential-Endocrinology-Diabetes-Essentials-Richard/dp/1118763963/ref=sr_1_2?crid=1DAVS2SPPZMCB&keywords=1%29+Essential+Endocrinology+and+Diabetes&qid=1694193085&s=books&sprefix=1+essential+endocrinology+and+diabetes%2Cstripbooks%2C243&sr=1-2

It is also available from the Wiley website: <https://www.wiley.com/en-us/search?pg=essential%20endocrinology>

- 2) **Biochemistry (Illustrated Review).** 8th edition. Abali, E.E., Cline S.D., Franklin, D.S., and Viselli, S.M. Wolters Kluwer/Lippincott Williams & Wilkins, New York, NY, 2022.

The Biochemistry (Illustrated Review) textbook can be purchased at the bookstore, on Amazon or if you go directly to the publisher's website. Amazon has this book available as e-text, paperback or spiral-bound (\$68-146): <https://www.amazon.com/Lippincott-Illustrated-Reviews-Biochemistry/dp/1975155068>

This book can also be found under the "View Online" option of the link below which is linked to the USC library. Before access is provided, you will be prompted for your USC credentials: <https://meded-wwhealthlibrary-com.libproxy1.usc.edu/book.aspx?bookid=3073>

- 3) **The Metabolic Syndrome.** 2nd edition. Byrne, C.D. and Wild, S.H. Wiley-Blackwell Publishing, Malden, MA, 2011.

This book is available for free on the USC library website: <https://onlinelibrary-wiley-com.libproxy1.usc.edu/doi/book/10.1002/9781444347319>

It is also available for \$113-143 on Amazon: https://www.amazon.com/Metabolic-Syndrome-Christopher-D-Byrne/dp/1444336584/ref=asc_df_1444336584/?tag=hyprod-20&linkCode=df0&hvadid=312142103956&hvpos=&hvnetw=g&hvrnd=2857116535355557462&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmid=&hvlocint=&hvlocphy=9073456&hvtargid=pla-570159995756&psc=1

- 4) **Lab Manual; available in the bookstore**

Sharing of Course Materials Outside of the Learning Environment is Strictly Prohibited

•USC has a strict policy (SCampus Section 11.12[B]) that prohibits sharing of **any** synchronous and asynchronous course content outside of the learning environment. Any student who violates this policy will be prosecuted to the maximum extent allowable by the USC Student Conduct Code, including failure of the course and suspension from the University.

Distribution or use of notes or recordings based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is a violation of the USC Student Conduct Code. This includes, but is not limited to, providing materials for distribution by services publishing class notes. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the Internet or via any other media. (See Section C.1 Class Notes Policy).

Description and Assessment of Assignments

- Class material will be evaluated via four exams (three midterms & one final) and one final lab grade that includes grades on several lab assignments.
- Grades will be recorded in the Blackboard gradebook **except for the final exam and the final grade.**

Exams

- Exams will be a combination of multiple-choice, true or false, short-answer response, and problem-solving questions. There will be four exams; three midterms and one final exam. The exams will provide a summative assessment of your understanding of the material covered in class. The final exam will be cumulative.
- Class notes and textbook information will form the basis of the material that will be on the exams. If you attend class regularly, you will be updated on the status of lecture notes and course material/announcements.
- A midterm exam can be taken after the specified date **ONLY** if the student has a **documented** excuse. A request to take a make-up exam must be accompanied by evidence of necessity (illness, travel with a USC team). Make-up exams will be different from the scheduled exam and will be proctored by different personnel.
- Instructors (both lab and classroom instructors) need to receive information regarding **OSAS mandated requirements** during the first or second week of class. Please provide the letter with the requirements to your instructors promptly.

Labs

- The lab grade will be calculated from lab reports and exams, which will be explained in detail by your lab TA or lecturer.

Grading Breakdown

Assignment	% of Grade
Midterm 1 – Turcotte	15
Midterm 2 - Turcotte	22.5
Midterm 3 – Crawford	15

Final – Crawford	22.5
Lab Grade	25
Total	100

Grading Timeline

•All graded work will be returned no later than one week after the submission deadline.

2% Extra credits via JEP or seminar attendance

•If you decide to do either of those options for extra credit, **you must send an email to Dr. Turcotte by Feb 2nd, 2024** to let her know of your decision.

- 1) **JEP:** At this point in time, the JEP program has not confirmed whether HBIO 407 will have a JEP option. I will update this aspect of the syllabus as soon as JEP informs me of their decision.
- 2) **Seminar attendance:** 2% extra credit can also be obtained by **attending 2 research seminars from the HBIO seminar series and 2 seminars either on UPC or on HSC. The seminars should be related to some aspect of biology or physiology.** For each seminar, students will have **to attend the seminar and to write a 1 page summary of what was presented by the researcher.** The 1-page summary should include an introduction, an organized summary of the research presented and a conclusion. For each seminar attended and 1-page summary submission, students can be give up to 0.5% for a grand total of 2% points (for 4 attended and summary). Summaries **MUST** be emailed to **Dr. Turcotte within 1 week of the seminar.** Students must clearly explain which seminar was attended.

If you do not complete all 4 summaries, you will receive a **grade of 0.**

Late work

- If the submission deadline for an assignment is missed, the assignment may be submitted up to one week late. A **20% grade deduction** will be applied to all late assignments.
- If you miss submitting work for an unavoidable, documented, and serious reason, discuss the situation with me during office hours.

Grading Scale

- A grade of zero will be applied to submitted work that does not comply with the USC standards of academic conduct. Such work may not be resubmitted for a new grade.
- Exams and lab grades will not be given a letter grade. **Only the final grade will be given a letter grade.**
- Grades are NOT rounded or curved.** A grade of 86.99 is a B grade. A final grade of 89.99 will **NOT** be reflected as an A-. It is always difficult to miss a grade boundary by a small amount. But to round up would defeat the purpose of having an objective grading scale and it would also mean that announcing a specific grade boundary is not accurate. That would be unfair. Therefore, I make the grade boundary objective and sharp. **There are NO exceptions.**
- Course final grades will be determined using the following scale:

A 94-100

A-	90-93.99
B+	87-89.99
B	83-86.99
B-	80-82.99
C+	77-79.99
C	73-76.99
C-	70-72.99
D+	67-69.99
D	63-66.99
D-	60-62.99
F	≤59.9%

Classroom Norms

•To promote a respectful, professional, and productive classroom environment, the following expectations will be maintained during all class sessions.

- Do not interrupt when someone else is speaking
- You can criticize ideas, but not people
- Avoid inflammatory language
- Either support assertions with evidence, or speak from personal experience
- Do not dominate the discussion
- Make a single point each time you speak, rather than making a series of statements at once

•**Masking:** The ongoing Covid-19 pandemic combined with the flu season may necessitate the return of masking at some point during the semester. With this in mind and with the latest LA County recommendations, **we will support instructors, students, TA's and lecturers who choose to wear a mask in the classroom or the lab as needed based on personal preferences and/or requirements.** There is no need to explain or justify your choice (but you can do so if you wish).

Course Schedule: A Weekly Breakdown

Date	Lecture Topic	Holt & Hanley	Abali et al.	Byrne & Wild
Jan. 9	Course Overview: Endocrine System Overview	1, 2		
Jan. 11	Classification of hormones; Secondary Messenger Systems	2, 3		
Jan. 16	Catecholamines; production & secretion	6		
Jan. 18	Catecholamines; secondary messenger system & biological actions	2, 3, 6		
Jan. 23	Insulin; production & secretion	11	23	
Jan. 25	Insulin; secondary messenger system & biological actions	11, 2, 3	23	
Jan. 30	Midterm 1			
Feb. 1	Insulin; secondary messenger system & biological actions	11, 2, 3	23	
Feb. 6	Cortisol; production & secretion	5, 6		
Feb. 8	Cortisol; secondary messenger system, biological actions	6		

Feb. 13	Glucagon; production & secretion, biological actions	11		
Feb. 15	GH & IGF1; production & secretion, biological actions	5		
Feb. 20	Feed-Fast cycle		23, 24	
Feb. 22	Review			
Feb. 27	Midterm 2			
Feb. 29	T1DM	11,12		
Mar. 5	Insulin resistance & T2DM	13		
Mar. 7	Diabetes; overarching considerations	14		5
Mar. 12	Spring Recess			
Mar. 14	Spring Recess			
Mar. 19	Diabetes; microvascular complications	14		
Mar. 21	Adipose Tissue & Obesity	15		
Mar. 26	Inflammation			13
Mar. 28	Obesity; metaflammation			14
Apr. 2	Midterm 3			
Apr. 4	Metabolic syndrome			1,2
Apr. 9	Metabolic Syndrome & The Brain			9
Apr. 11	Metabolic Syndrome & NAFLD			15
Apr. 16	Metabolic syndrome & Hypertension			3
Apr. 18	Metabolic syndrome & atherosclerosis			12
Apr. 23	Metabolic syndrome & Nutritional Intervention			17
Apr. 25	Non-Dietary Treatments for Metabolic Syndrome			18
May 7	8 am – 10 am: Final Exam			

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on [Research and Scholarship Misconduct](#).

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University’s educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call

studenthealth.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call

suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press "0" after hours – 24/7 on call

studenthealth.usc.edu/sexual-assault

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086

eeotix.usc.edu

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298

usc-advocate.symplcity.com/care_report

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - (213) 740-0776

osas.usc.edu

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

USC Campus Support and Intervention - (213) 821-4710

campussupport.usc.edu

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - (213) 740-2101

diversity.usc.edu

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call

dps.usc.edu

Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

ombuds.usc.edu

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

Occupational Therapy Faculty Practice - (323) 442-3340 or otfp@med.usc.edu

chan.usc.edu/otfp

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.

HBIO 407L: Endocrinology and Metabolism
Extra 2% (similar to JEP) Assignment: Seminar Summaries

Learning Objectives

- to develop and execute research hypothesis related to nutrition and health
- to use research articles to defend a scientific argument
- to recommend ways by which dietary and physical activity interventions in different socioeconomic environments could help resolve the obesity epidemic
- to discover and discuss the impact of human diversity as manifested by age, disability, gender, ethnicity and social status on nutritional deficits

Assignment Description:

- If you decide to do this option for extra credit, **you must send an email to Dr. Turcotte Feb 2nd, 2024** to let her know of your decision.

Seminar attendance:

- An extra credit option of maximum 2% will also be available by attending **4 research seminars** either on UPC or on HSC.
- Two (2) of those seminars should be HBIO seminars.**
- All seminars** should be related to some aspect of **biology or physiology and should be hosted by a department at UPC or HSC.**
- For each seminar, students will have to attend the seminar and to write a 1 page summary (single spaced) of what was presented by the researcher.
- The 1-page summary should include an introduction, an organized summary of the research presented and a conclusion.**
- For each seminar attended and 1-page summary submission, students can be given up to 0.5% for a grand total of 2% points (for 4 attended and summary).
- Summaries **MUST** be emailed to **Dr. Turcotte within 1 week of the seminar.** Students must clearly explain which seminar was attended (see description below).
- Dr. Turcotte will review seminars attended between Jan 8th and April 26th.**

Grading Rubrics:

Total Points: 2 points

- Each summary will be worth 0.5 point for a possible maximum total of 2 points.

For each summary (worth 0.5 point):

1) Introduction: 25% of 0.5 point

- The student will introduce the speaker and topic to be covered by the speaker.

2) Discussion of results presented by speaker: 50% of 0.5 point

•The student will discuss the results that were presented. This section of the summary should be logically organized so that the reader can follow the results and the reasons behind each experiment.

3) Conclusion: 25% of 0.5 point

•The student will summarize the seminar findings and include the presenter's discussion of their findings. The student should also provide information about whether the seminar was interesting, provided enough data and/or any other opinions about the seminar.