

USC Dornsife
College of Letters,
Arts and Sciences

As of 03/21/2021; this syllabus may be amended as we get more news regarding Covid-related issues.

HBIO302L – Nutrition and Metabolism (4 units)

Fall 2020

Lectures: Tuesday/Thursday; 9:30-10:50 am

Location: GFS 116

Labs: Monday, 2:00-4:50 pm; Wednesday, 8:00-10:50 am; Wednesday, 11:00-1:50 pm; Wednesday, 2:00-4:50 pm; Thursday, 11:00-1:50 pm

Location: B12

Instructor: Lorraine P. Turcotte, PhD

Office: AHF 247

Office Hours: Tuesdays, 11:00-12:30 pm & by appointment

A sign-up sheet will be provided for students who want to sign up for Tuesday office hour slots. Special office hour appointments should be organized in advance via email correspondence with Dr. Turcotte.

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.

Lab Director: Anh-Khoi Nguyen, PhD

Office: PED 109

Office Hours: by appointment

Contact Info: agnguyen@usc.edu

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

Lab Instructor: Bara Floyd, MS

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: Carina Pautz, MS

Office: PED 109

Office hours: TBA

Contact Info: cpautz@usc.edu

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

Course Description

- Gastrointestinal physiology and energy metabolism as it relates to macronutrient intake. Theories and principles of nutrition and their impact on metabolic regulation. This course is a pre-requisite for HBIO 407L.
- This course is intended to introduce HBIO majors to the physiological principles associated with the digestion and absorption of macronutrients as well as the chemical basis of the major catabolic and anabolic pathways associated with

carbohydrate and lipid metabolism. Food digestion and absorption as well as cellular metabolism are the foundation of life; food intake dictates energy intake and cellular metabolism regulates energy output. Upon completion of this course, students should be able to think about energy intake and output at the cellular level and be able to assess the impact of dysregulation on disease development.

Learning Objectives

- to describe the structure/function of selected cells, tissues, organs and organ systems of the gastrointestinal tract
- to relate the knowledge of nutrition and metabolism to a healthy lifestyle
- to correlate circulating metabolic markers with dietary intake
- to develop and execute research hypothesis related to nutrition and health
- to use research articles to defend a scientific argument
- to complete a research experiment using biological instrumentation, perform statistical analysis and report data
- 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

Prerequisite:

- BISC 220L or BISC 221L

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), to upload most assignments 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/>.
- 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

- When ordering books online from the bookstore, please go to usctext.com and you can either select in-store pick-up or have them shipped to their home.

- 1) **The Science of Nutrition**, 5th edition, Thompson, J.L., Manore, M,M, and Vaughan, L.A. Benjamin Cummings, San Francisco, CA, 2016.

The Science of Nutrition textbook is available at the Bookstore, on Amazon or if you go directly to the publisher's website. Amazon has this book available as e-text for rent or download.

- 2) **Biochemistry (Illustrated Review)**, 7th edition, Ferrier, D. Wolters Kluwer/Lippincott Williams & Wilkins, United Kingdom.

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 for rent or download. 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://uosc.primo.exlibrisgroup.com/permalink/01USC_INST/hs9vaa/alma991042589597603731

3) Lab Manual; available in the bookstore

- 4) **Copies of lecture slides and other class information** will be posted on Blackboard usually the night before class. When needed, further resources including research articles will be provided via Blackboard.

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 one homework assignment (Poster), one powerpoint presentation (group project), two exams and one lab grade.
- Grades will be recorded in the Blackboard gradebook.

Exams

- Exams will be a combination of multiple-choice, true or false, short-response, and problem-solving questions. There will be two exams. 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** medical excuse. A request to take a make-up exam must be accompanied by evidence of necessity and must be made before the date of the scheduled exam. Make-up exams may be different from the scheduled exam and may be proctored by personnel who do not have extensive knowledge in the area being tested.
- The final exam is **cumulative**. The final exam will not be available for review. **Final grades will NOT be posted on Blackboard.**

Pathway Poster

- Each student will produce a series of slides in Powerpoint or a poster via the use of a poster board. The slides or the poster will include all of the pathways discussed in class.

Presentation

•For this assignment, groups of 4-5 students will be established. Each group will create a Powerpoint presentation that explains the goal, methods, results and conclusions of a research article on a topic chosen from a list of real-world application of nutrition issues. The list will be provided by Dr. Turcotte. There are three phases associated with this presentation.

- 1) Students will provide the **names of the students in their group and the topic** that they have chosen. The topic will be chosen from a list provided by Dr. Turcotte.
- 2) Each group **will meet with Dr. Turcotte to discuss the list of articles** that they have read and which article they have chosen to use for their presentation. **Students will provide Dr. Turcotte with the list of articles** that they have read.
- 3) **Students will present to the class.** All students must participate in the presentation. A rubric will be made available for all presentation components. The class will vote to select the “Best Presentation” award.

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 Final Grade
Pathway Poster	15
Midterm 1	15
Topic presentation	22.5
Lab Grade	25
Final Exam	22.5
	100

Grading Timeline

- All graded work will be returned no later than one week from the submission deadline.

Late work

- If the submission deadline for a presentation 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.

Assignment Submission

- All assignments (in-class work and presentation components) should be submitted through Blackboard.

Academic Integrity & 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	95-100
A-	90-94.99
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%

Technology in the classroom

- I encourage you to use personal electronic devices (laptops, ipads) for academic purposes directly related to the class. Students using a device for purposes not directly related to the class will be required to put the device away. There are times that I will request that all devices are put away to ensure focus on class activities.
- Please turn off or disable all cell phones or other electronic communication devices during class time.

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 Sept 2021** to let her know of your decision.

- 1) **JEP:** At this point in time, the JEP program has not confirmed whether HBIO 302 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:** The 2% extra credit by attending 4 research 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.

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

Course Schedule: A Weekly Breakdown

Date	Lecture Topic	Lab	Reading Chapters	
			Thompson	Ferrier
Aug 24	Course Overview; Digestion	Lab Introduction & Statistics	3	
Aug 26	Digestion/Absorption		3	
Aug 31	Digestion/Absorption	Journal Club	3	
Sept 2	Digestion/Absorption of Carbohydrates		4	7
Sept 7	Digestion/Absorption of Carbohydrates		4	7
Sept 9	Digestion/Absorption of Proteins Topic & Group selection finalized		6	19
Sept 14	Digestion/Absorption of Lipids		6	15, 17
Sept 16	Digestion/Absorption of Lipids		5	15, 17
Sept 21	Digestion/Absorption of Lipids		5	15, 17, 18
Sept 23	Glycolysis/Glycogenolysis			8, 9, 11
Sept 28	Glycolysis/Glycogenolysis			8, 9, 11
Sept 30	Midterm			
Oct 5	Glycolysis, glycogenolysis, β -oxidation			16
Oct 7	β -oxidation, lipolysis			16
Oct 12	Krebs Cycle, ETC			6, 9
Oct 14	FALL RECESS			
Oct 19	Gluconeogenesis/Glycogen Synthesis			10, 11
Oct 21	FA Synthesis, TG Synthesis			16
Oct 26	ATP counts – list of articles dues			

	Point person for each group			
Oct 28	ATP counts / Metabolic Regulation			
Nov 2	Regulation: Carbohydrate Pathways			
Nov 4	Regulation: Carbohydrate Pathways			
Nov 9	Regulation: Lipid Pathways			
Nov 11	Healthful Diet		2, 4, 5, 6	24, 27
Nov 16	Healthful Diet		2, 4, 5, 6	24, 27
Nov 18	Presentations – Metabolic pathway Poster due			
Nov 23	Presentations			
Nov 30	Presentations			
Dec 2	Presentations			
Dec 9	11 AM -1 PM - 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 scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

Student Health Counseling Services - (213) 740-7711 – 24/7 on call

engemannshc.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) 740-4900 – 24/7 on call

engemannshc.usc.edu/rsvp

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

Office of Equity and Diversity (OED) | Title IX - (213) 740-5086

equity.usc.edu, titleix.usc.edu

Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

Bias Assessment Response and Support - (213) 740-2421

studentaffairs.usc.edu/bias-assessment-response-support

Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

The Office of Disability Services and Programs - (213) 740-0776

dsp.usc.edu

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Support and Advocacy - (213) 821-4710

studentaffairs.usc.edu/ssa

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

Diversity at USC - (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.