

BIOC13 – Biochemistry II: Bioenergetics and Metabolism

Winter 2020

Course description: A lecture course that introduces how cells or organisms extract energy from their environment. The major metabolic pathways to extract energy from carbohydrates, fats and proteins will be discussed. An emphasis will be placed on real-world applications of biochemistry to metabolism.

Pre-requisites: [BIOB11H3 or BIOB10Y3] and CHMB41H3

Instructor: Dr. Eliana Gonzales-Vigil
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TAs can be contacted through Quercus.

Lectures:

Wednesday	11.00 am – 1.00 pm	@ SY110
Thursday	12.00 pm – 1.00 pm	@ AA112

Office hours:

Thursday	2.00 pm – 3.00 pm	@ SW567
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Contact information:

- Any important information related to this course will be announced on **Quercus**. Students are expected to check the announcements regularly.
- Questions about the **course content**, should be posted on the **Quercus discussion board**. Other students may benefit from reading questions and answers.
- For questions about **course administration**, send the instructor an **email**.
- For emails, please use **#BIOC13** in the subject line, and include your **full name** in the body of the message. Otherwise, your message might be ignored.
- Typically expect responses within 48 h, but NOT on weekends.

Lecture Materials:

Lecture notes will be posted (as pdf) on Quercus before each lecture. However, lecture notes only allow you to follow the lectures easily, and **some materials discussed in class will not be included** in the lecture notes.

NOTE: I reserve the right to make changes to the lecture notes after they are posted.

Textbooks:



Publisher: W. H. Freeman, 2019

ISBN N: 9781319275440

Purchase of the textbook is not absolutely required, but highly recommended. We will discuss the Case Studies provided on SaplingLearning with this book. This means that at least one member of the group should have access to the platform.

Any other Biochemistry book can be used as reference. Metabolic pathways do not change from author to author. A few examples include:

Biochemistry by Miesfeld & McEvoy.

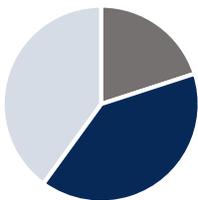
Biochemistry by Garrett et al.

Biochemistry by Berg et al. (This is the extended version of the textbook we are using. It is **freely available online** <https://www.ncbi.nlm.nih.gov/books/NBK21154/?term=biochemistry>)

Lecture Topics:

Basic Concepts in Metabolism	Chapter 15
Glycolysis	Chapter 16
Gluconeogenesis	Chapter 17
Glycogen metabolism	Chapters 24 & 25
Citric acid cycle	Chapters 18 & 19
Oxidative phosphorylation	Chapter 20
ATP synthesis	Chapter 21
Photosynthesis	Chapter 22 & 23
Fatty acid degradation and synthesis	Chapters 27 & 28
Amino acid degradation and synthesis	Chapters 30 & 31

Course evaluation:



Case Studies	20%	5 tests x 4% each
Term Tests	40%	2 tests x 20% each
Final exam	40%	Cumulative

Bonus points: Optional tasks will be announced on Quercus throughout the semester.

Case Studies:

On the following dates, we will use the **Thursday** lecture (**12.10 to 1 pm**) to solve Case Studies.

Jan 23 rd	Introduction to metabolism – topics up to Chapter 16
Feb 6 th	Carbohydrate metabolism – topics up to Chapter 19
Mar 5 th	Real-life case study from the Toronto Zoo
Mar 19 th	Lipid metabolism – topics up to Chapter 27
April 2 nd	Integration of metabolism – topics up to Chapter 30

NOTES:

- This is a group activity, with one report per group submitted at the end of the session.
- Attendance is mandatory to receive credit for the group submission.
- It is an academic offence to sign-in for someone else during the case studies.
- At least one member per group should have access to SaplingLearning during these sessions. Please coordinate with your group the day before the announced dates.
- If you miss a case study for a legitimate reason, submit an explanation and proper documentation to the instructor.

Term Tests: Jan 29th and March 4th (in class)

First term test covers materials from weeks 1-4th, and the second from 5-8th. The exact coverage will be announced on Quercus. The test will be in the format of multiple choice and short answer questions.

Please note that the term tests are in class. Having a lab session or another course conflicting with a term test is not a valid reason to miss it.

Final Exam: TBA

Schedule of the final exam will be arranged by the Registrar's office. The format will be similar to the term tests but will be cumulative. However, emphasis will be on materials covered in the last four weeks of classes. The final exam will require students to think critically and creatively. Students will be expected to apply their knowledge of the discussed pathways to explain novel observations.

NOTES:

- If you miss a term test for a valid reason (medical or otherwise), you must provide appropriate documentation within two days of the term test to Jennifer Campbell (jacampbell@utsc.utoronto.ca) and copy the instructor (e.gonzalesvigil@utoronto.ca).
- In the event that you missed the test for a legitimate cause, you will have the opportunity to write a make-up test. The make-up test will be scheduled at the discretion of the instructor during the 11th week of classes and cover content from Term Test 1 and 2. The format of the make-up test might be different, and might include an oral exam.
- If you miss the make-up test for a valid reason, the final will have a weight of 60%.
- If a student misses both Term Tests for legitimate reasons, the make-up test will only replace one of the missed tests. The other missed test will be treated as zero.
- Missing a term test for any invalid reason will result in a grade of zero for that term test.
- Students who miss the final exam must contact the Registrar's Office for appropriate arrangement. <https://www.utsc.utoronto.ca/registrar/missing-examination>

AccessAbility: Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible. AccessAbility Services staff (located in Rm SW302, Science Wing) are available by

appointment to assess specific needs, provide referrals and arrange appropriate accommodations 416-287-7560 or email ability@utsc.utoronto.ca . The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Academic Integrity: "The University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential appropriate acknowledgement, submitting your own work in more than one course without the permission of the instructor, making up sources or facts, obtaining or providing unauthorized assistance on any assignment. On tests and exams cheating includes using or possessing unauthorized aids, looking at someone else's answers during an exam or test, misrepresenting your identity, or falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes."

Electronics Use: Please stay on task if you choose to use laptops or other mobile devices during class. These tools can be useful to take notes, refer to class readings, or look up important course concepts. However, checking social media, texting or other non-course specific activity distracts you and people around you from learning, and can ultimately result in receiving a lower grade in this course. Students are expected to **turn off cell phones** during class.

Recording in the classroom: Recording or photographing any aspect of a university course - lecture, tutorial, seminar, lab, studio, practice session, field trip etc. – without prior approval of all involved and with written approval from the instructor is **not permitted**. This does not apply to students with disabilities.