

University of Toronto Scarborough – Department of Biological Sciences  
**BIOC13 – Biochemistry II: Bioenergetics and Metabolism – Summer 2016**

**Course Instructor:** **Dr. Jason Brown**  
Email: nysuloem.brown@utoronto.ca  
Office: SW563B (\*\*for now\*\*)  
Office Hours: Tuesdays 9am-2pm  
\*\*Additional office hours will  
be made available prior to exams

**Teaching Assistants:** **Peter Perri**  
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**Course Description:** A lecture course that introduces cellular metabolism, the process by which living organisms extract and utilize energy from their environment. Topics include: bioenergetics; oxidative phosphorylation; aspects of carbohydrate, lipid, and amino acid metabolism; regulation of metabolism; and the integration of metabolic pathways.

**Prerequisites:** BIOB10Y3 [or BIOB10H3 and BIOB11H3] and CHMB41H3  
(CHMB42H3 is no longer a prerequisite for this course)

**Exclusions:** CHMB62H3, BCH210H, BCH242Y, BCH310H, (BGYC13H3)



**Sustainability:** This course is recognized as a UTSC Green Course, meaning it has steps in place to reduce the amount of course-generated paper. Those particular steps are double-sided printing of exams and electronic submission and grading of all assignments.

**Lectures:** Tuesdays 6:10-9pm in SW128  
\*\*We will take two ~10 minute breaks during class  
\*\*Journal club meetings, when held, will begin at approximately 8pm

Lecture notes will be posted (in PowerPoint format only) on Blackboard ~24 hours before each lecture. **NOTE: I reserve the right to make changes to the lecture notes after they are posted.** Students are encouraged to use digital copies of these notes for note-taking in class; however, if students prefer to print these notes, they are encouraged to use double-sided printing and/or scrap paper.

By the end of each week, an *optional* quiz (here *optional* means not worth any marks) will be posted on Blackboard. These quizzes will allow students to i) assess their understanding of the lecture content, ii) think critically and creatively about lecture content, as well as apply lecture content to novel situations and problems, and iii) prepare for the Term Tests and Final Exam. ***Students are strongly encouraged to discuss these quizzes with the course instructor when they encounter any difficulties, either by email or during office hours (preferred).***

**Textbooks:** I do not “teach from a textbook”. There will be no assigned readings from any textbook, and only material covered in class will be subject to examination; however, in my experience, many students enjoy having a textbook to supplement their lecture notes. If you so desire, I would recommend the following textbook:

*Bioenergetics 4*, by D.G. Nicholls et al. (2013)

\*\*This book is considered the foremost authority on bioenergetics and metabolism

An e-book version of this textbook is available **for free** via the UTSC library’s website. UTSC’s license agreement with the publisher of this textbook permits students to use this textbook for course study but does not permit me to post any content of this textbook to Blackboard.

I will post suggested readings from this textbook on Blackboard; however, this textbook may discuss material not covered in lecture, and I may discuss material in class not covered by this textbook. **You are responsible for all material covered in class only.**

### **Evaluation:**

Term Tests	35%	(23% best; 12% worst)
Journal Club Blogs	30%	(5% each for 6 blogs)
Final Exam	35%	

### **Important Notes Regarding Evaluations:**

#### **Term Tests**

There are two Term Tests in this course. The dates and times of the Term Tests will be determined by the Registrar’s office during the first few weeks of the semester, and I will post this information on Blackboard as soon as it is available.

The Term Tests are not cumulative. The lectures covered on each Term Test will be announced in class and on Blackboard. Term Tests will be 2 hours and will comprise of multiple choice and short answer questions. Students will have some choice with regards to which questions they answer (e.g., answer 20 out of 25 multiple choice questions). **A large proportion of the Term Test questions will require students to think critically and creatively about the lecture content as well as apply the lecture content to novel situations and problems; this reflects how important I believe it is that students learn to develop these skills.** The optional online quizzes will help students to prepare themselves to tackle such questions successfully.

If you know **in advance** that you cannot write a Term Test at the scheduled time because it conflicts with some other **valid activity**, please notify me as soon as possible so that we can make arrangements for you to write the Term Test at an alternative time. **Any such alternative time must be before the scheduled date of the Term Test.**

If you miss a Term Test due to medical illness, then you must submit a detailed UTSC Medical Certificate filled out by the physician who saw you on the day of the Term Test. This note must be submitted to the course instructor as soon as possible following the Term Test, whether in person or via email. Other medical notes will not be accepted, and if the UTSC Medical Certificate is not completed to the satisfaction of the course instructor, it may be refused. The UTSC Medical Certificate can be found via the following link:

[http://www.utsc.utoronto.ca/~registrar/resources/pdf\\_general/UTSCmedicalcertificate.pdf](http://www.utsc.utoronto.ca/~registrar/resources/pdf_general/UTSCmedicalcertificate.pdf).

If you miss a Term Test for any other valid reason, please consult with the course instructor as soon as possible. The course instructor will determine whether the reason given for a missed Term Test is valid in accordance with university policies. Also, the course instructor may ask for any documentation required to verify the reason given.

Students who miss one Term Test for a valid reason (medical or otherwise) will not be permitted to write a make-up Term Test; rather, the weight of the remaining Term Test will be increased to 35% of their final grade. Students who miss both Term Tests for valid reasons will not be permitted to write make-up Term Tests; rather, the weight of their final exam will be increased to 65%, and they will be asked to submit an additional written assignment worth 5%, which will be due no later than the last day of classes. **Under no circumstances will the weight of a missed Term Test be transferred to the Final Exam, so please do not ask.**

Students who miss a Term Test for any invalid reason will receive a grade of zero for that Term Test.

### **Journal Club Blogs**

The details of the Journal Club Blogs will be outlined in a PowerPoint presentation given during the first class. This presentation will be posted on Blackboard and will constitute part of this syllabus.

### **Final Exam**

The Final Exam will be scheduled by the Registrar's office (August 6-20) and will be worth 35% of the final grade. It will be 3 hours and will cover all course material, though it will place considerable emphasis on the material covered since the last Term Test. It will have the same format as the Term Tests.

## **Schedule:**

Lecture Topics to be Covered:

- 1 – Fundamental Concepts in Bioenergetics and Metabolism
- 2 – Glycolysis
- 3 – Dietary Carbohydrate and Glycogen Metabolism, Gluconeogenesis, and the Pentose Phosphate Pathway
- 4 – Citric Acid and Glyoxylate Cycles
- 5 – Chemiosmotic Theory
- 6 – Respiratory Electron Transport Chain
- 7 – ATP Synthesis
- 8 – Dietary Lipid Metabolism; Triacylglycerol and Fatty Acid Catabolism
- 9 – Triacylglycerol and Fatty Acid Synthesis\*\*
- 10 – Nitrogen Metabolism; Amino Acid Catabolism and Synthesis\*\*

\*\* These topics will only be covered if time permits

Journal Club Meetings:

- May 10 at 8pm
- May 24 at 8pm
- June 7 at 8pm
- June 28 at 8pm
- July 12 at 8pm
- July 26 at 8pm

## Accessibility Needs:

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. I will work with you and AccessAbility Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC AccessAbility Services staff (located in SW302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or [ability@utsc.utoronto.ca](mailto:ability@utsc.utoronto.ca).

## Academic Integrity:

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, 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 offences include, but are not limited to:

- In papers and assignments:*
- using someone else's ideas or words without 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:*
- using or possessing unauthorized aids;
  - looking at someone else's answers during an exam or test
  - misrepresenting your identity
- In academic work:*
- falsifying institutional documents or grades
  - falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. There are other offences covered under the Code, but these are the most common. ***Please respect these rules and the values that they protect.***