Biochem4M03 – 2020 CLASS SYLLABUS

Undergraduate course in Biochemistry

TITLE: Cellular and Integrated Metabolism

Dates: Tuesday January 7 – Tuesday April 7, 2020

Time: 3.30 – 4.20pm (Tuesday, Wednesday, Friday)

Place: ABB 165

Course Coordinator: Dr. Deborah Sloboda

Course Website: Avenue to Learn

Course Professors

- Course Coordinator: Deborah Sloboda, PhD, Professor, Department of Biochemistry and Biomedical Sciences, Associate Member, Departments of Pediatrics, Obstetrics and Gynecology
  - HSC-4H21, sloboda@mcmaster.ca
  - OFFICE HOURS: by appointment (please email for appt)
- Instructor: Jonathan Schertzer, PhD, Associate Professor, Department of Biochemistry and Biomedical Sciences, Associate Member, Departments of Pediatrics
  - HSC-4H19, ext 22254, schertze@mcmaster.ca
  - OFFICE HOURS by appointment
- Instructor: Greg Steinberg, PhD, Professor, Department of Medicine, Associate Member, Department of Biochemistry and Biomedical Sciences
  - HSC-4N63, ext 21691, gsteinberg@mcmaster.ca
  - OFFICE HOURS by appointment

Your professors have a background in physiology and metabolism. They are available for questions before and after class. They are happy to meet with you, but your experienced TA’s are your first point of contact.

Teaching Assistants

You have 4 well-qualified teaching assistants with a background in biochemistry, metabolism, immunology and prenatal physiology. These TAs are able to assist you with questions regarding course material, assignments and initial queries with marking and mark assignments. TAs will have pre-organized office hours that will be announced in class and set in the Avenue to Learn calendar.

Christian Bellissimo bellisc@mcmaster.ca (Head TA)
Patrycja Jazwiec jazwiepa@mcmaster.ca
Erica Yeo yeoe@mcmaster.ca
Cassandra Chen chenyk2@mcmaster.ca
Course Description

The goal of this course is to gain an advanced understanding of nutrition and metabolism that will integrate previous knowledge in nutrition, biochemistry, molecular biology, physiology, genetics and endocrinology (it is assumed students have a basic knowledge of these areas). This course will examine the role of macronutrients in fundamental biochemical processes as they relate to health and disease, over the life course. You will study the biochemical metabolism of macronutrients including carbohydrates, fat and protein and their metabolic regulation. You will be introduced to the metabolic physiology of pregnancy and how the fetal environment can modify disease risk. The course will review current scientific literature and pertinent research papers as they relate to disease and disease processes.

Topics will focus on metabolism and gene-environment (nutrition/physical activity) interactions in relation to common chronic diseases (including obesity, diabetes, cardiovascular disease, and osteoporosis).

The sessions will be didactic lecture, although all instructors engage in much discussion that requires participation from students. Specific areas of nutrition to be covered are: 1) carbohydrate metabolism; 2) fatty acid metabolism; 3) energy balance; 4) immunometabolism; 5) diabetes and insulin resistance; 6) maternal, fetal and placental metabolism 7) programming of chronic disease – the early origins hypothesis.

Intended Learning Outcomes

At the end of this course students will be able to explain and apply the integrated biochemical pathways that are discussed in lecture as they relate to metabolism in both a healthy and disease related context. Knowledge of these pathways will be tested in short and long essay questions in 2 short in-class tests and a final cumulative exam. The students will be able to analyze and evaluate disease state conditions, using integrated biochemical pathways, in a major research paper (assignment) and recommend a health-related action. Students will also be able to apply their knowledge in participatory in-class “Journal Club” type assessments of a published paper. NOTE: published papers discussed in “Journal Club” lectures are testable material.

Methods of Evaluation: 3 components

1) IN CLASS TESTS (2 x 20% = 40% final grade)

The course is divided into 3 sections – each section is taught by a different instructor. The first 2 sections will be tested individually. Tests are held in class and are short and long answer, and some multiple-choice questions.

Each Test is worth 20% of the final grade.

2) ASSIGNMENT (1x = 30% final grade)

Students will be graded on one essay-style Assignment. The objective of this assignment is to use the knowledge gained in the lectures to evaluate a current issue in metabolism and its relationship to disease. Students will be graded on their ability to critically review the scientific literature on specific topics as they relate to the biochemistry of metabolism and nutrition. This involves the ability to appreciate the strengths and weaknesses of primary research articles using human clinical trials versus basic science in animal or cell-based models. In these assignments, students will be asked to take a stand on an issue that could affect the treatment choices of a population and present it as a recommendation to change clinical practice. Three possible topics will be presented to the class and each student will be asked to choose one of the 3 topics.

Assignments are to be submitted electronically via A2L Dropbox and are due by 5pm on the set due date (refer to the lecture schedule for due dates). Any assignments received after 5pm on the due date are considered late and will incur a 10% deduction on the final mark. For every day thereafter, there is a 10% per day deduction in the final mark.

OPTIONAL RE-MARKING OF ASSIGNMENT: All students have the option to re-submit their Assignment, in order to improve upon their writing and their mark (see lecture schedule for re-mark due date). Students seeking a re-mark are encouraged to use the feedback provided to improve their writing skills and ultimately improve their overall assignment mark. No MSAF or
late assignments will be accepted for this optional re-mark deadline. All re-mark assignments must be uploaded to A2L dropbox by 5pm on the set due date (refer to lecture schedule for re-mark due date). *NB this is OPTIONAL and no penalty occurs if students hand in their Assignment only once at the first deadline.

*Note there is no guarantee that assignment grades will increase after re-marking. All assignments handed in for a re-mark will be the final grade assigned (i.e. We will not accept the higher of two marks – any assignments handed in on the final re-mark due date will be the student’s final assignment mark).

3) FINAL EXAM (30% final grade)

The final exam is cumulative. However, the majority of questions on the final exam (75% of it) will test your knowledge on Section 3 of the course material. Questions testing your knowledge on Sections 1 and 2 will make up the remaining 25% of the final exam. The exam will be made up of multiple choice, short answer, and long answer (essay-type) questions.

**Remarketing of assignments, tests and exams**

Please refer to the Dept of Biochemistry and Biomedical Sciences for policies on remarking and viewing of assignments, tests and exams at [http://fhs.mcmaster.ca/biochem/undergraduate/forms_and_procedures.html](http://fhs.mcmaster.ca/biochem/undergraduate/forms_and_procedures.html). This course follows the policies as they are laid out on the Dept website.

**Resource Material**

There is NO required text for the course, below are optional items, most found in library Key reference used in Sections 1 & 2:


For general background on Section 3:

- Gluckman PD and Hanson MH. *The fetal matrix: Evolution, development and disease*. 2005 Cambridge University Press, UK (in HSC library)

Websites with reliable information on nutrition include:


**Course Evaluation**

We value students’ comments and evaluation of our lectures and teaching materials and ask that all students please complete the final course evaluation at the end of the semester. Final grades will be rounded up to the nearest GPA for all students (to a maximum of 1 mark) if the class response to Course evaluation is >65%. PLEASE COMPLETE THE COURSE EVALUATION AND ENCOURAGE YOUR CLASSMATES TO DO SO!
Note: The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.
Academic Dishonesty

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grad of F assigned for academic dishonesty”), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, specifically Appendix 3, located at http://www.mcmaster.ca/senate/academic/ac_integrity.htm

The following illustrates only three forms of many different forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one’s own for which credit/permission has not been obtained.
2. Improper collaboration in group work.
3. Copying or using unauthorized aids in tests and examinations

In this course we may use a software package designed to reveal plagiarism to monitor the content of the Assignment. Students may be required to submit their work electronically and in hard copy so that it can be checked for academic dishonesty.

To avoid plagiarism just follow these basic rules:

1. Do not copy text from articles that have been written by others and offer it as your own work.
2. If you need to quote text written by another author(s), copy the passage accurately, enclose it in quotation marks and reference it appropriately.
3. If you wish to paraphrase (or summarize) experimental results, conclusions, or an original idea or opinion which has been published by another author(s) give a reference to the article.

REQUESTS FOR RELIEF FOR MISSED ACADEMIC TERM WORK

McMaster Student Absence Form (MSAF): In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”.

This course abides by the MSAF rules and regulations of the Faculty of Science Associate Dean’s office. http://www.science.mcmaster.ca/associatedean/. Please email the Course Coordinator (DM Sloboda) for MSAF enquiries.

ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES

Students with disabilities who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail sas@mcmaster.ca. For further information, consult McMaster University’s Academic Accommodation of Students with Disabilities policy.

ACADEMIC ACCOMMODATION FOR RELIGIOUS, INDIGENOUS OR SPIRITUAL OBSERVANCES (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the RISO policy. Students requiring a RISO accommodation should submit their request to their Faculty Office normally within 10 working days of the beginning of term in which they anticipate a need for accommodation or to the Registrar’s Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.
EXTREME CIRCUMSTANCES
The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.

Note: Policy on Late Withdrawal
McMaster University provides a Late Withdrawal option to assist students who have become irretrievably behind in a course. Students who have fallen behind with assignments and/or are not prepared to write final examinations (or equivalent) in one or more courses are encouraged to make use of this option and must contact their Academic Advisor in the Faculty/Program Office. Students will work with their Academic Advisor to discuss the situation and what steps they can take to prevent a recurrence.

The maximum number of units for which students may request a Late Withdrawal is 18 units throughout their undergraduate degree.

Students may request a Late Withdrawal, without petition, no later than the last day of classes in the relevant Term. However, it is important to note that:

- Requests for Late Withdrawal cannot be made in courses for which the final exam (or equivalent) has been attempted or completed. This also includes courses where a final grade has been assigned (e.g. clinical courses).
- Such requests will be cancelled or revoked if it is determined that the student attempted or completed the final exam (or equivalent).
- Students cannot use the Late Withdrawal option for courses in which they are under investigation or for which they have been found guilty of academic dishonesty.

Course(s) approved for Late Withdrawal will be:

- Assigned a non-numeric grade of LWD, in lieu of an alpha/numerical grade
- Excluded from the calculation of the GPA
- Ineligible for tuition refund

Approval of a late withdrawal is final, and requests to be re-enrolled in the withdrawn course(s) will not be considered. A withdrawal will not preclude students from enrolling in the course(s) in a subsequent term.