

**Faculty of Science Course Syllabus**  
**Department of Biochemistry and Molecular Biology**  
**BIOC 4306**  
**Nutritional Biochemistry**  
**Winter 2016**

**Instructor(s):**

Dr. R. McLeod Tupper 9C 494-7013 roger.mcleod@dal.ca

**Lectures:** 1300-1430 Collaborative Health Education Building C268

**Laboratories:** none

**Tutorials:** none

**Other:** Debates, Invited seminars

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**Course Description**

Appropriate nutrition is essential for health and reflects the basic biochemistry of the organism. Changes in the human diet can impact health and disease. This course considers the principles of optimal nutrition in a biochemical context and the role of nutrition in disease etiology and treatment.

**Course Prerequisites**

BIOC 3300.03, BIOC 3400.03, BIOC 3700.03 or instructor's permission.

**Course Objectives/Learning Outcomes**

1. Identify and define major components of the human diet: macronutrients, minerals, vitamins.
2. Recognize the role of experimental science, case studies and epidemiology in defining optimal nutrition.
3. Describe the physiology and biochemistry of digestion of macronutrients.
4. Compare and contrast the essential features in the digestion and absorption of carbohydrate, lipid and protein.
5. Provide examples and biochemical principles of disease states associated with excess and deficiency of macronutrients.
6. Describe the biochemical and physiological principles of fluid and electrolyte balance.
7. Define energy balance and describe the biochemical changes that occur in energy excess.
8. Compare and contrast the nutritional requirements in the elderly and the newborn to adult values.
9. Provide rational biochemical arguments for nutritional modulation of common chronic diseases. e.g. Nutritional approaches to weight loss, dietary modulation of cardiovascular disease, impact of dietary fructose on metabolism, trans fatty acids and disease, genetics and the manipulation of our food supply, challenges in the adoption of vegetarian and vegan diets, regulatory process for nutritional supplements.

### Course Materials

Textbook - *Advanced Nutrition and Human Metabolism*, 6th Edition, S.S. Gropper, J.L. Smith, J.L. Groff. Wadsworth, Cengage Learning, 2013. (5th edition is sufficient if available)

Course website - <http://www3.biochem.dal.ca/4306/>

### Course Assessment

There will be one short test during the term, held during the normal lecture period and therefore limited to 75 minutes. In addition, written papers for the debates, oral contributions to the debates and class participation in the seminar will constitute an additional method of evaluation. The final examination (3 hours) will contain a selection of essay topics taken from the seminars from which you will be expected to write 3 essays. Your final grade will be determined as follows:

Term test	30	February 11, 2016
Debates	35	Written papers due March 15, 2016
Final examination	35	Scheduled by Registrar
Total	100	

### Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (<50)
A- (80-84)	B- (70-72)	C- (55-59)	

### Course Policies

#### Missed Examinations and Assignments

A student who misses an examination (midterm test, or debate, etc.) due to illness should notify the professor, instructor or department office and provide a valid medical certificate not more than 1 week after the scheduled examination (see Dalhousie Calendar). The medical certificate should indicate the dates and duration of the illness. Special "make-up" examinations will normally be written within 7 calendar days after the missed examination. Absence for non-medical reasons is not ordinarily acceptable unless pre-arranged with the professor/instructor. A missed examination for which no satisfactory arrangement has been made will receive a mark of zero.

The final examination date and time will be assigned by the Registrar and posted in early February 2016. A request for an alternative time will only be granted under exceptional circumstances and in accordance with university regulations.

Assignments must be submitted to the professor/instructor or the department office no later than 5:00 p.m. on the designated due date. Extension of the due date will only be granted in the case of illness and supported by a valid medical certificate presented to the professor/instructor within one week of the due date. Other reasons, such as excessive workload, are not normally acceptable. Extension of due date will not normally exceed 7 calendar days. The grade for late reports will be reduced by 10% for each day after the due date.

**Course Content**

<u>Date</u>	<u>Lecture Topic</u>	<u>Instructor</u>		
January	Tues. 5	Course organization and introduction	RSM	
	Thurs. 7	1. Introduction to Nutrition	RSM	
	Tues. 12	2. Epidemiology – Nutrition and Disease	RSM	
	Thurs. 14	3. Physiology and Biochemistry of Absorption	RSM	
	Tues. 19	4. Macronutrients - Carbohydrate	RSM	
	Thurs. 21	5. Macronutrients – Lipid	RSM	
	Tues. 26	6. Macronutrients – Protein	RSM	
	Thurs. 28	7. Micronutrients – Vitamins	RSM	
February	Tues. 2	8. Micronutrients – Minerals and Trace Elements	RSM	
	Thurs. 4	9. Water and Electrolytes	RSM	
	Tues. 9	10. Energy Balance and Weight Management	RSM	
	Thurs. 11	<b>Midterm, Lectures 1-10</b>		
	Tues. 16	<b>No Class – Study Break</b>		
	Thurs. 18	<b>No Class – Study Break</b>		
	Tues. 23	<b>No Class</b>		
	Thurs. 25	11. Debate Topic #1 –	Students	
	March	Tues. 1	12. Debate Topic #2 –	Students
		Thurs. 3	13. Debate Topic #3 –	Students
Tues. 8		14. Debate Topic #4 –	Students	
Thurs. 10		15. Debate Topic #5 –	Students	
Tues. 15		16. Debate Topic #6 –	Students	
Thurs. 17		17. Fermentation Technologies	Paulson	
Tues. 22		18. Energy Fuels Use in Exercise	Kane (St. FX)	
Thurs. 24		19. Marine Toxins in Foods	Garduno (CFIA)	
Tues. 29	20. Biochemical Adaptations to a Vegan Diet	Glanville (MSVU)		
Thurs. 31	21. Product Development from NHPs	Chisholm (NRC)		
April	Tues. 5	22. Are You a Good Fat or a Bad Fat?	McLeod	
	TBA	<b>Final Exam</b>		

## **ACCOMMODATION POLICY FOR STUDENTS**

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic protected under Canadian Human Rights legislation. The full text of Dalhousie's Student Accommodation Policy can be accessed here:

[http://www.dal.ca/dept/university\\_secretariat/policies/academic/student-accommodation-policy-wef-sep--1--2014.html](http://www.dal.ca/dept/university_secretariat/policies/academic/student-accommodation-policy-wef-sep--1--2014.html)

Students who require accommodation for classroom participation or the writing of tests and exams should make their request to the **Advising and Access Services Centre (AASC)** prior to or at the outset of the regular academic year. More information and the ***Request for Accommodation*** form are available at [www.dal.ca/access](http://www.dal.ca/access).

## **ACADEMIC INTEGRITY**

Academic integrity, with its embodied values, is seen as a foundation of Dalhousie University. It is the responsibility of all students to be familiar with behaviours and practices associated with academic integrity. Instructors are required to forward any suspected cases of plagiarism or other forms of academic cheating to the Academic Integrity Officer for their Faculty.

The Academic Integrity website (<http://academicintegrity.dal.ca>) provides students and faculty with information on plagiarism and other forms of academic dishonesty, and has resources to help students succeed honestly. The full text of Dalhousie's ***Policy on Intellectual Honesty*** and ***Faculty Discipline Procedures*** is available here:

[http://www.dal.ca/dept/university\\_secretariat/academic-integrity/academic-policies.html](http://www.dal.ca/dept/university_secretariat/academic-integrity/academic-policies.html)

## **STUDENT CODE OF CONDUCT**

Dalhousie University has a student code of conduct, and it is expected that students will adhere to the code during their participation in lectures and other activities associated with this course. In general:

"The University treats students as adults free to organize their own personal lives, behaviour and associations subject only to the law, and to University regulations that are necessary to protect

- the integrity and proper functioning of the academic and non – academic programs and activities of the University or its faculties, schools or departments;
- the peaceful and safe enjoyment of University facilities by other members of the University and the public;
- the freedom of members of the University to participate reasonably in the programs of the University and in activities on the University's premises;
- the property of the University or its members."

The full text of the code can be found here:

[http://www.dal.ca/dept/university\\_secretariat/policies/student-life/code-of-student-conduct.html](http://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html)

## **COPYRIGHT**

All members of the Dalhousie community are expected to comply with their obligations under Canadian copyright law. Dalhousie copyright policies and guidelines, including our Fair Dealing Guidelines, are available at <http://www.dal.ca/dept/copyrightoffice.html>. Copyright questions should be directed to the Copyright Office at [copyright.office@dal.ca](mailto:copyright.office@dal.ca).

**SERVICES AVAILABLE TO STUDENTS**

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits. The services are available to all Dalhousie students and, unless noted otherwise, are free.

<b>Service</b>	<b>Support Provided</b>	<b>Location</b>	<b>Contact</b>
<b>General Academic Advising</b>	Help with <ul style="list-style-type: none"> <li>- understanding degree requirements and academic regulations</li> <li>- choosing your major</li> <li>- achieving your educational or career goals</li> <li>- dealing with academic or other difficulties</li> </ul>	<b>Killam Library Ground floor Rm G28</b> <b>Bissett Centre for Academic Success</b>	In person: Killam Library Rm G28 By appointment: <ul style="list-style-type: none"> <li>- e-mail: <a href="mailto:advising@dal.ca">advising@dal.ca</a></li> <li>- Phone: (902) 494-3077</li> <li>- Book online through MyDal</li> </ul>
<b>Dalhousie Libraries</b>	Help to find books and articles for assignments Help with citing sources in the text of your paper and preparation of bibliography	<b>Killam Library Ground floor</b>  Librarian offices	In person: Service Point (Ground floor)  By appointment: Identify your subject librarian (URL below) and contact by email or phone to arrange a time: <a href="http://dal.beta.libguides.com/sb.php?subject_id=34328">http://dal.beta.libguides.com/sb.php?subject_id=34328</a>
<b>Studying for Success (SFS)</b>	Help to develop essential study skills through small group workshops or one-on-one coaching sessions  Match to a tutor for help in course-specific content (for a reasonable fee)	<b>Killam Library 3<sup>rd</sup> floor</b>  Coordinator Rm 3104  Study Coaches Rm 3103	To make an appointment: <ul style="list-style-type: none"> <li>- Visit main office (Killam Library main floor, Rm G28)</li> <li>- Call (902) 494-3077</li> <li>- email Coordinator at: <a href="mailto:sfs@dal.ca">sfs@dal.ca</a> or</li> <li>- Simply drop in to see us during posted office hours</li> </ul> <b>All information can be found on our website: <a href="http://www.dal.ca/sfs">www.dal.ca/sfs</a></b>
<b>Writing Centre</b>	Meet with coach/tutor to discuss writing assignments (e.g., lab report, research paper, thesis, poster) <ul style="list-style-type: none"> <li>- Learn to integrate source material into your own work appropriately</li> <li>- Learn about disciplinary writing from a peer or staff member in your field</li> </ul>	<b>Killam Library Ground floor</b> Learning Commons & Rm G25	To make an appointment: <ul style="list-style-type: none"> <li>- Visit the Centre (Rm G25) and book an appointment</li> <li>- Call (902) 494-1963</li> <li>- email <a href="mailto:writingcentre@dal.ca">writingcentre@dal.ca</a></li> <li>- Book online through MyDal</li> </ul> We are open six days a week  <b>See our website: <a href="http://writingcentre.dal.ca">writingcentre.dal.ca</a></b>