

FOOD 4201: Advanced Nutrition and Energy Metabolism

Fall 2024

<p>Course Instructor: Dr. Véronic Bézaire</p> <p>How to address me: Véronic</p> <p>Gender Pronouns: (she/her/hers) (learn more)</p> <p>Email: veronic.bezaire@carleton.ca</p> <p>If you have or question or would like to talk with me, you can send an email or approach me during class time.</p> <p>Phone: 613-520-2600 x 5012</p>	<p>Office Location: 319 Steacie Building Click here for visual directions.</p> <p>Class Location: 431 Tory Building (In-person) Click here for visual directions.</p> <p>Class Times: Mondays 2:35pm-5:25pm ET</p> <p>Prerequisites: FOOD 2001, BIOC 3101 and fourth year standing</p>
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Course description

Metabolism of macronutrients in the human body. Detailed catabolic and anabolic reactions of carbohydrates, lipids, and proteins. Regulatory control points in healthy and diseased states. Discussion of the literature pertaining to nutrition, metabolism, and chronic diseases.

Course objectives

This course tackles advanced nutrition and energy metabolism. The basis of nutrition is biochemistry therefore, biochemistry principles will be revisited. The fate of macronutrients from ingestion onwards will be examined. With each macronutrient and pathway, we will discuss relevant nutritional issues, in the healthy and diseased states. Through this course, students will learn to:

1. Describe principles of biochemistry

- a. Interpret and explain metabolic pathways of macronutrients
- b. Identify pathway regulatory steps and describe modes of regulation
- c. Identify and justify the need for tissue-specific pathways, regulation or regulators

2. Integrate nutrition and biochemical knowledge of macronutrients

- a. Relate nutrient deficiency or overload to disease
- b. Analyze interactions between nutrients
- c. Analyze crosstalk between tissues
- d. Postulate on systemic effects of nutrients
- e. Interpret scientific literature in nutritional biochemistry

Land Acknowledgement

Here at Carleton University, it is important that we acknowledge that the land on which we gather is the traditional and unceded territory of the Algonquin nation.

Inclusive teaching statement

I will continually strive to create inclusive learning environments and would appreciate your support and feedback.

Learning Materials

Websites:

In pre-class tasks, we will be accessing the following [Metabolic Pathways Website](#) regularly for review and construction of pathways.

Textbook (optional):

I will be referring to the following textbooks. However, any biochemistry textbook you already have should suffice.

Advanced Nutrition and Human Metabolism, 5th Edition, Sareen S Gropper, Wadsworth CENGAGE Learning
Biochemistry: A Short Course, John L. Tymoczko, W.H. Freeman Company.

Mandatory Technology Checklist:

- ☐ An internet-enabled computer (laptop/desktop)
- ☐ Access to reliable internet

Note: Mention options here for students who do not have access to these resources. Options include financial aid from Carleton, inexpensive options for technology (Best Buy refurbished products, Kijiji), & single workspaces available for student use on campus.

Assessment in this Course

Research about learning strongly suggests that the most important factor in learning is doing the work of reading, writing, recalling, practicing, synthesizing, and analyzing. Learning happens best when people actively engage material on a consistent basis, and that is why I have high generated the following learning activities and summative assessments. I am confident that, with appropriate effort, you **all** can meet those standards.

Grade Breakdown

Pre-Class Tasks	12%	4 of 5, x 3% (SAT/UNSAT)
In-Class Tasks	27%	9 of 11, x 3% (SAT/UNSAT)
Summative Assessment 1	23%	Due date: Fri Oct 18 th , 2024
Summative Assessment 2	23%	Due date: Friday Nov 15 th 2024
Summative Assessment 3	15%	Due date: Fri Dec 06 th 2024

A passing grade must be obtained on the midterm and final assessments to pass the course.

Pre-Class Tasks

Pre-class worksheets are a type of learning activity that contribute to learning objectives 1: *Describe principles of biochemistry* and 2: *Integrate nutrition and biochemical knowledge of macronutrients*.

The worksheets are to be completed before class, as preparation for the synchronous session. There are five sets of worksheet submissions. The **best 4 of 5** will count towards the Pre-Class Tasks as 3% each. Submissions are due by 2:30 ET on the day of class and will be evaluated as SAT/UNSAT. Revisions within 72 hours will be requested when evaluated as UNSAT. Submissions can be made early should you know in advance that you must miss class. Since flexibility is built-in this learning activity (as best 4 of 5), missed or late submission will be assigned an UNSAT with no chance of revision.

In-Class Tasks

In-class tasks will be completed in groups during class with the help of shared documents. As formative assessments, they contribute to learning objectives 1: *Describe principles of biochemistry* and 2: *Integrate nutrition and biochemical knowledge of macronutrients*.

In-class tasks will encourage discussion of concepts with your peers in real time for deeper learning. There are 11 in-class tasks. The **best 9 of 11** will count towards In-Class Tasks as 3% each. Completion and quality of in-class tasks will be evaluated in class via shared documents (no Brightspace submission). They will be evaluated as SAT/UNSAT. Revisions within 72 hours will be requested when evaluated as UNSAT. Since flexibility is built-in this learning activity (as best 9 of 11), missed or late submission will be assigned an UNSAT with no chance of revision.

Summative Assessments 1 - 3

The summative assessments contribute to learning objectives 1: *Describe principles of biochemistry* and 2: *Integrate nutrition and biochemical knowledge of macronutrients*. All assessment consists of three questions to be answered with a schematic diagram, a choice of creative writing, and a video recording of your explanations. Class notes, scientific literature, and online resources will be required. It is your responsibility to evaluate the credibility of online resources you choose to use. All summative assessments are due at 10PM. **A 48h grace period past the due date is available for Summative Assessments 1 and 2 (but not 3), with no questions asked.**

Accommodations for Missed Work

Carleton is committed to providing academic accessibility for all individuals. You may need special arrangements to meet your academic obligations during the term. The accommodation request processes are outlined on the Academic Accommodations website (students.carleton.ca/course-outline)

- **Deferred/missed term work for short-term accommodation (5 days or less):** Should you require short-term accommodation beyond the 48h grace period described above, please inform your course Instructor and submit the [Academic Consideration for Coursework Form](#).
- **Deferred/missed term work for longer term incapacitation (5 days or longer):** Should you require accommodations for this course that are longer than the 5-day (short-term) period, please email me to discuss how/whether accommodation needs could be met for this course.

Content Generation with Attribution

Students may use AI tools for sharing ideas, clarifying challenging concepts, or getting started on projects. Some acceptable uses include:

- Brainstorming ideas (e.g., generating essay topics with ChatGPT, using Microsoft Word's Smart Lookup to find inspiration and related topics)
- Creating outlines (e.g., using AI to structure an essay or presentation flow, using Microsoft Word's Outline View with AI suggestions)
- Providing definitions or explanations of complex concepts (e.g., using AI to explain a difficult theory, e.g., using Microsoft Word's Researcher tool to find relevant information)

It is necessary to document your use of AI in this course, using the following guidelines:

- Clearly identify and cite AI-generated text (e.g., 'The following paragraph was generated by ChatGPT/Microsoft Word's Researcher tool')
- Review, edit, and ensure accuracy and originality of final submissions
- AI-generated content should not exceed 30% of the total assignment length

Why have I adopted this policy? This policy supports the use of AI as a supplementary tool, helping students develop ideas and structure their work while emphasizing the importance of transparency and personal engagement with the content. AI can be used for inspiration and foundational support and can encourage students to critically assess and refine AI-generated material.

Academic Integrity

Academic Integrity is upholding the values of honesty, trust, respect, fairness, responsibility, and courage that are fundamental to the educational experience. Carleton University provides supports such as academic integrity workshops to ensure, as far as possible, that all students understand the norms and standards of academic integrity that we expect you to uphold. Your teaching team has a responsibility to ensure that their application of the Academic Integrity Policy upholds the university's collective commitments to fairness, equity, and integrity.

(Adapted from [Carleton University's Academic Integrity Policy](#), 2021).

Examples of actions that do not adhere to Carleton's Academic Integrity Policy include:

- Plagiarism
- Accessing unauthorized sites for assignments or tests
- Unauthorized collaboration on assignment and exams
- Using artificial intelligence tools such as ChatGPT when your assessment instructions say that it is not permitted

Please review the checklist [linked here](#) to ensure you understand your responsibilities as a student with respect to academic integrity and this course.

Sanctions for not abiding by Carleton's Academic Integrity Policy

A student who has not upheld their responsibilities under Carleton's Academic Integrity Policy may be subject to one of several sanctions. A list of standard sanctions in science can be found [here](#).

Additional details about this process can be found on the [Faculty of Science Academic Integrity website](#). Students are expected to familiarize themselves with and follow the Carleton University [Student Academic Integrity Policy](#). The Policy is strictly enforced and is binding on all students.

Feeling Sick?

If you feel very sick (e.g., fever, chills, stomach upset) do not come to class or campus. Ask a classmate for notes taken during class to complement lecture slides. The missed lecture will still count towards the 10 of 12 in-class tasks to be completed.

Mental Health

If you are struggling, please do not hesitate to reach out. I am happy to listen, and/or direct you to resources that might help. In terms of class, if you need extra help or missed a lesson, don't stress! Email me and we will set a time to meet. I'll work with you, I promise. Remember that Carleton also offers an array of mental health and well-being resources, which can be found [here](#).

University Policies

In accordance with the Carleton University Undergraduate Calendar Regulations, the letter grades assigned in this course will have the following percentage equivalents:

A+ = 90-100	B+ = 77-79	C+ = 67-69	D+ = 57-59
A = 85-89	B = 73-76	C = 63-66	D = 53-56
A- = 80-84	B- = 70-72	C- = 60-62	D- = 50-52
F = <50			

WDN = Withdrawn from the course

ABS = Student absent from final exam

DEF = Deferred

FND = (Failed, no Deferred) = student could not pass even with 100% on final exam

Students with Disabilities

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. For more details, visit the [Paul Menton Centre website](#).

Addressing Human Rights Concerns

The University and all members of the University community share responsibility for ensuring that the University's educational, work and living environments are free from discrimination and harassment. Should you have concerns about harassment or discrimination relating to your age, ancestry, citizenship, colour, creed (religion), disability, ethnic origin, family status, gender expression, gender identity, marital status, place of origin, race, sex (including pregnancy), or sexual orientation, please contact the Department of Equity and Inclusive Communities at equity@carleton.ca.

Religious Obligations

Please contact me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, please review the Student Guide to Academic Accommodation (PDF, 2.1 MB).

Survivors of Sexual Violence

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit:

<https://carleton.ca/sexual-violence-support/>

For Pregnancy

Please contact me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, please review the Student Guide to Academic Accommodation (PDF, 2.1 MB).

Accommodation for Student Activities

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see the Senate Policy on Accommodation for Student Activities (PDF, 25KB).

Student Rights & Responsibilities

Students are expected to act responsibly and engage respectfully with other students and members of the Carleton and the broader community. See the 7 Rights and Responsibilities Policy for details regarding the expectations of non-academic behaviour of students. Those who participate with another student in the commission of an infraction of this Policy will also be held liable for their actions.

Student Concerns

If a concern arises regarding this course, **your first point of contact is me**: Email or drop in during student hours and I will do my best to address your concern. If I am unable to address your concern, the next points of contact are (in this order):



Note: You can also bring your concerns to Ombuds services.

Assistance for Students

Academic and Career Development Services: <http://carleton.ca/sacds/>

Writing Services: <http://www.carleton.ca/csas/writing-services/>

Peer Assisted Study Sessions (PASS): <https://carleton.ca/csas/group-support/pass/>

Math Tutorial Centre: <https://carleton.ca/math/math-tutorial-centre/>

Science Student Success Centre: <https://sssc.carleton.ca/>

Course Outline

DAY	MODULES	TOPICS	PRE-CLASS TASKS	IN-CLASS TASKS	SUMMATIVE ASSESSMENTS
SEP 09	1: Gastrointestinal system	Anatomy & Digestion	---	Draw an enterocyte	
SEP 16	2: Carbohydrates and their metabolism	Carbohydrates	---	Complete digestive table	
SEP 23		CHO Metabolism 1	Worksheet 2A	Answer pathway questions	
SEP 30		CHO Metabolism 2	Worksheets 2A-2B	Answer pathway questions	
OCT 07		Type 2 diabetes	---	Diabetes effects and treatments	Summative #1 FRI Oct 18
OCT 14	STATUTORY HOLIDAY				
OCT 21	FALL BREAK				
OCT 28	3: Lipids and their metabolism	Lipids	---	Complete lipoprotein table	
NOV 04		Lipid Metabolism 1	Worksheet 2A, 3A-3B	Answer pathway questions	
NOV 11		Lipid Metabolism 2	Worksheets 3C-3D	Answer pathway questions	Summative #2 FRI Nov 15
NOV 18	4: Amino acids and their metabolism	AA and Proteins	---	Answer nutrition question	
NOV 25		AA Metabolism	Worksheets 4A-4B	Answer pathway questions	
DEC 02		Integration	---	Complete metabolite tables	
Dec 06		Review	---	---	Summative #3 FRI Dec 06

OCT 14 Statutory Holiday

OCT 21-25 is fall break

DEC 06 follows Monday schedule

Pre-class tasks are due at 2:30PM on the day of class.

Summative assessments are due at 10:00PM on designated due dates.

