Course Description
Topics discussed include the structure, biosynthesis and functions of biologically important compounds, enzymes, control of metabolism, genetic engineering and nutrition. Medical aspects are stressed.
NOTES: This course cannot be used as a prerequisite for any other biochemistry course and is not normally accepted by Faculties of Dentistry or Medicine in fulfillment of the requirement of a biochemistry course for admission.
FORMAT: Lecture
LECTURE HOURS PER WEEK: 3
RESTRICTIONS: This class is restricted to students in the BScN and BHSc programs.

Course Objectives/Learning Outcomes
Biochemistry 1420.03 will introduce you to the field of biochemistry, building on your knowledge of general and organic chemistry. The aims of this class are two-fold:
1. To provide you with the background needed for your further studies in biological and medical science.
2. To take you to the forefront of some very exciting areas of science, which are beginning to have a major impact on medical practice.
3. The final page in each chapter of Helleiner outlines the objectives for the section.

We describe here three inter-dependent approaches to learning about biochemistry: textbook, lectures, and self-directed assignments.

Course Materials

Textbooks
Biochemistry, An Introduction, with Clinical Correlations, C.W. Helleiner, Fourteenth Edition, 2018. This book provides an outline of the material covered in the class, together with examples of human (and occasionally animal) conditions in which biochemical processes are functioning in an abnormal way. You are provided with chapter references to this book in the Calendar tool on Brightspace.

Lectures
The material you are expected to learn will be covered in lectures and self-directed assignments. Weekly chapter references to the textbook are provided for each session on
your Brightspace calendar tool. Understanding that a three-hour class is tough, breaks
will be scheduled appropriately; you will see this organization in the calendar. Whenever
possible each class period will include an audio-visual component that highlights an
aspect of the learning objectives.

**Self-directed (Virtual) Assignments**

There are five assignments. These consist of an introductory page or two of information,
followed by a set of questions for you to answer in the spaces provided. They are
designed to allow you to expand your knowledge of material covered in lectures. You are
encouraged to discuss these questions with your friends, but you should write the answers
in your own words.

To encourage you to manage your time, each assignment has a *virtual due date*. On or
before each due date, you can ask questions about the assignments. If time allows in
class, we might touch on the assignment material.

The assignments will not be marked. You will not be given the answers. However, they
will constitute a component of the final exam, so you should take them seriously,
remaining especially aware of the virtual due dates.

**Web-based Services**

- **Brightspace**: http://dal.brightspace.com establishes the course calendar; may be
  used as an electronic grade book; class announcements; a means of contacting
  each other using mail.
- **Communications**: BIOC1420@listserv.dal.ca may be used for class-wide
  communications. Please monitor your @dal.ca email for announcements.
- **1420 Webspace**: http://www3.biochem.dal.ca/1420/ is the primary distribution
  site for PowerPoint files and other lecture-related content.

**Course Assessment**

There are no midterms in this class. Topics in Helleiner and the assignments form the
basis of the final exam. Discussions in class and audiovisual materials intended to
establish context is not examined.

Each week you will be given the chance to respond to a number of multiple-choice
questions. Your score will be tallied, constituting 50% of your final grade. The questions
(only) will be posted after the fact to help you study.

<table>
<thead>
<tr>
<th>BIOC1420.03 will adopt the in-class technologies used by the majority of students concurrently in Human Physiology (PHYL1010X/Y).</th>
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<td>There may be an additional licensing cost for some students.</td>
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The final exam will constitute the balance of the class grade (50%), consisting of the
multiple-choice questions seen in class (which may be re-worded) and a portion based on
the assignments. The Registrar will schedule the Final Exam in the exam period.

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common
Grade Scale.
Short-term Absence/Missed exams, midterms, or assignments, etc.

A student who misses an evaluation item due to illness must notify the instructor as soon as possible, and must submit a Student Declaration of Absence Form through the course Brightspace page within three calendar days following the last day of absence. Absence for non-medical reasons is not ordinarily acceptable unless prearranged with the professor. A missed evaluation item for which no satisfactory arrangement has been made will be given a mark of zero. Absence for non-medical reasons is not ordinarily acceptable unless prearranged with the instructor. In general, a missed evaluation component (including assignments, essays, and oral presentations) for which no satisfactory arrangement has been made will be given a mark of zero.

The Student Declaration of Absence form can only be submitted up to two separate times per course during a term and only for absences of three days or shorter. Students who exceed one or both of these limits must inform their course instructor and course coordinator and will be required to register with an Advisor at Student Academic Success (SAS). If students have recurring short-term absences and do not register with SAS, it is at the instructors’ discretion to disallow any further Student Declarations and deny alternate coursework arrangements.

Please refer to the link below for further information on the University policy regarding Long-term absence.

https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html

A student who misses the final examination due to illness must notify the course coordinator or academic department office within 48 hours to provide a medical certificate (see Dalhousie Calendar, section 16.8). Absence for non-medical reasons is not acceptable. If necessary, a make-up final examination will be held by arrangement.

Other Notes

We are here to help. If anything puzzles you, please get it clarified after class.

Respect the rights of your classmates who attend class to learn. Turn off your cell phone; wait for the break to text or make calls. Use of laptops is allowed, but limited to class-related material. Talk to your classmates only when it is appropriate; I like to keep the class interactive, but some students are more sensitive than others when their classmates become unruly. Too soon, you will be accredited professionals: behave that way.

We hope to make learning biochemistry an interesting, enlightening and stimulating experience. We are excited about this subject and we would like you to share our enthusiasm.
Useful Online Resources

Wikipedia is not a reliable resource because it is user-driven, with only the Internet user base verifying its content. The scope of information available on line is vast. Be cautious regarding legitimacy.

Some legitimate sites I have used

The Google Scholar portal (http://scholar.google.com) is a better search tool for university students seeking informed opinion rather than Google, Yahoo, or Bing. Alternatively, use search tool at http://www.library.dal.ca/ for journal and book searches.

The US National Institutes of Health is very good if you want to access peer-reviewed journals in PubMed. You have free access to an online database of biomedical journal citations and abstracts created by the U.S. National Library of Medicine (NLM®). Approximately 5,400 journals published in the United States and more than 80 other countries have been selected and are currently indexed. Records are indexed with NLM's controlled vocabulary, the Medical Subject Headings (MeSH®). Articles can be very technical.


Sometimes you want to be able to converse with patients about their condition, especially about what is happening or about to happen to them in the Capital District Health Authority (CDHA) in lay language. Start at http://www.chda.nshealth.ca, select Capital Health A-Z in the horizontal bar near the top, then Patients and Families in the vertical list on the left. Look for the Patient Information Pamphlets link — these pamphlets contain information produced for patients by Capital Health. The search tool on this page allows you to find information by keyword, title, specialty and language. The direct link:

http://www.cdha.nshealth.ca/patients-clients-visitors/patient-education-resources

The Mayo Clinic is a not-for-profit medical practice dedicated to the diagnosis and treatment of virtually every type of complex illness. Mayo provides clinic and hospital services at its locations in Rochester, Minn.; Jacksonville, Fla.; and Phoenix and Scottsdale, Ariz. It is part of Mayo Clinic's mission to serve as a reliable source of health information:

http://www.mayoclinic.com/

Health Canada relies on high-quality scientific research. It conducts ongoing consultations with Canadians to determine how to best meet their long-term health care needs, communicating information about disease prevention to protect Canadians from avoidable risks, and encouraging Canadians to take an active role in their health, such as increasing their level of physical activity and eating well. The site tries to relate many things, including policy statements, public announcements, and information on diseases, in both official languages:

http://www.hc-sc.gc.ca/
Some Common Medical Prefixes and Suffixes

uni ______
m mono ______
__ di ________
__ bi ________
__ bis ________
__ tri ________
oligo ________
poly ________
multi ________
__ genesis ____________
__ lysis ________
__ lytic ________
__ a ______
__ ab ________
__ non ________
__ in ________  
__ dys ________
__ ex(o) ______
__ end(o) ______
__ trans ______
__ erythro ________
__ leuco ______
__ myo ______
__ neo ______
__ some ________

___ emia ________
___ emic ________
__ hemo ________
__ uria ________
__ hydro ________
__ lipo ________
__ glyco ________
__ philic ________
__ phobic ________
__ ortho ________
__ eu ________
__ hypo ________
__ sub ________
__ hyper ________
__ super ________
__ iso ________
__ micro ________
__ macro ________
__ hetero ________
__ pseudo ________
__ pre ________
__ pro ________
__ post ________
__ cyto ________
__ __ cyte ________
__ __ cytic ________
__ patho ________
__ __ pathic ________

blood
urine
water
fat, lipid
sugar, carbohydrate
attracted to
avoiding
correct, normal
less than normal
more than normal
the same
small
large
different
false, wrong
before
after
cells
disease

Commonly Used Greek Letters

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Faculty of Science Course Syllabus (Section B)

Please ensure that the following information on University Policies and Student Resources is available to all students in your course. This document may be posted on your Brightspace course site, or elements may be copied into your Course Syllabus, Section A.

University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate.

**Academic Integrity**

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

*Information:* [https://www.dal.ca/dept/university_secretariat/academic-integrity.html](https://www.dal.ca/dept/university_secretariat/academic-integrity.html)

**Accessibility**

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

*Information:* [https://www.dal.ca/campus_life/academic-support/accessibility.html](https://www.dal.ca/campus_life/academic-support/accessibility.html)

**Student Code of Conduct**

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.


**Diversity and Inclusion – Culture of Respect**

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness.

*Statement:* [http://www.dal.ca/cultureofrespect.html](http://www.dal.ca/cultureofrespect.html)

**Recognition of Mi’kmaq Territory**

Dalhousie University would like to acknowledge that the University is on Traditional Mi’kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) (elders@dal.ca).


**Important Dates** in the Academic Year (including add/drop dates)

[https://www.dal.ca/academics/important_dates.html](https://www.dal.ca/academics/important_dates.html)

**University Grading Practices**

[https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html](https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html)

**Missed or Late Academic Requirements due to Student Absence** (policy)

[https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html](https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html)
Student Resources and Support

Advising

General Advising: https://www.dal.ca/campus_life/academic-support/advising.html
Science Program Advisors: https://www.dal.ca/faculty/science/current-students/academic-advising.html
Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html
Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html
International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports

Library: https://libraries.dal.ca/
Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html
Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html
Copyright Office: https://libraries.dal.ca/services/copyright-office.html
Fair Dealing Guidelines: https://libraries.dal.ca/services/copyright-office/fair-dealing.html

Other supports and services

Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html
Student Advocacy: https://dsu.ca/dsas

Safety

Biosafety: https://www.dal.ca/dept/safety/programs-services/biosafety.html
Chemical Safety: https://www.dal.ca/dept/safety/programs-services/chemical-safety.html
Radiation Safety: https://www.dal.ca/dept/safety/programs-services/radiation-safety.html

Scent-Free Program: https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html