

## Biochemistry 2288A

### Biochemistry and Molecular Biology for Foods and Nutrition

Course outline for Fall 2023



Although this academic year might be different, Western University is committed to a **thriving campus**. We encourage you to check out the [Digital Student Experience](https://www.uwo.ca/dse/) website to manage your academics and well-being. Additionally, the following link provides available resources to support students on and off campus: <https://www.uwo.ca/health/>.

The Department of Biochemistry recognizes diversity of identity and experience as a source of strength that promotes excellence, innovation, flexibility and adaptability in our discipline. We embrace, nurture, value and celebrate this diversity.

#### 1. Technical Requirements:



Stable WiFi connection



Laptop, tablet, or smartphone

#### 2. Important Dates:



Classes Begin	Classes End
Thursday, September 7, 2022	Friday, December 8, 2022

\* \* November 13, 2023: Last day to drop a first-term half course without penalty

\*\* September 29, 2023 is National Day for Truth and Reconciliation and is a non-instructional day

Reading Week	Study day(s)	Exam Period
October 30–November 5	December 9	December 10–22

#### 3. Instructor Information

Course Coordinator	Contact Information
<a href="mailto:mboffa@uwo.ca">Dr. Michael Boffa</a>	<a href="mailto:mboffa@uwo.ca">mboffa@uwo.ca</a>



Instructors	Topics	Office Hours	Office Hour Dates
<a href="#">Dr. Harvey Goldberg</a>	1-8	Tue 3:30 – 4:30 pm; Zoom	Sept 12 – Oct 18
<a href="#">Dr. Michael Boffa</a>	9-18	Tue 3:30 – 4:30 pm; Zoom and MBL C5	Nov 8 to final exam
Teaching assistant	Contact Information	Office Hours	
Aruun Beharry	<a href="mailto:abeharr3@uwo.ca">abeharr3@uwo.ca</a>	1 – 2 pm, Fridays; Zoom	

Rather than email instructors directly, students are encouraged to post questions on the Biochem 2288 Forum site on OWL (see Section 9). In addition, the teaching assistant will be available for individual appointments; details will be announced.

## 4. Course Delivery and Design

Biochemistry is the study of the molecules of life and centers on four key groups of biomolecules: proteins, lipids, carbohydrates and nucleic acids. Students will learn about the structure and function of these key biomolecules, the mechanics by which the cellular machinery is supplied with energy, and how the genetic material is converted to functional information. Links to Food Science and Nutrition will be emphasized throughout.

**Prerequisites:** Chem 1301A/B; Chem 1302A/B; Bio 1290B; AND registration in senior years of Foods and Nutrition modules.

**Delivery Mode:** In-person (with occasional asynchronous lectures as indicated on the schedule below)

### Timetabled Sessions

Days	Time	Location
Mon Wed Fri		

All course material will be posted to OWL: <http://owl.uwo.ca>. Any changes will be indicated on the OWL site and discussed with the class. We intend to post lecture slides and supporting materials, but we will not be livestreaming, recording, or posting the in-person lecture sessions themselves. Therefore, faithful class attendance is of paramount importance.

We will make use of iClicker audience response questions during lectures for interactive learning. It is not required to answer these questions for credit, and the instructors will not know who answered or what their answers were. Students can access the iClicker questions in class using a laptop, tablet, or smartphone. Instructions for using iClicker in this course will be posted to OWL in advance of the first class.

If students need technical assistance, they can seek support on the [OWL Help page](#). Alternatively, they can contact the [Western Technology Services Helpdesk](#). They can be contacted by phone at 519-661-3800 or ext. 83800.

[Google Chrome](#) or [Mozilla Firefox](#) are the preferred browsers to optimally use OWL; update your browsers frequently. Students interested in evaluating their internet speed, please click [here](#).

## 5. Learning Outcomes

Upon successful completion of this course, students will be able to:

1. Demonstrate basic knowledge about the structure, roles, and functions of the different classes of biomolecules.
2. Provide examples where defects in biochemical processes result in disease, and predict potential outcomes of biochemical defects.
3. Describe the central pathways that provide living organisms with energy, and the regulation of these pathways.
4. Detail information flow in living systems and mechanisms that regulate the expression of genetic material.
5. Formulate an approach to clone and express a gene of interest in bacteria.
6. Obtain and interpret scientific information from literature, databases and oral presentations.
7. Explain scientific concepts in a way that can be understood by a general audience.
8. Provide examples of how biochemical principles explain phenomena in food science and nutrition.

## 6. Course Content and Schedule

Schedule is subject to change.

<b>MWF 2:30-3:30 NSC-7</b>	<b>Topics</b>	<b>Instructor</b>
<b>M W F</b> 8 Sept. 11 13 15* 18 20 22 25* 27 2  4  6 Oct. 11 13 16 18 *asynchronous	1. Foundations 2. Aqueous Chemistry 3. Nucleic Acid Structure & Function 4. Amino Acids 5. Protein Structure 6. Protein Function 7. Enzyme Function 8. Enzyme Kinetics	Goldberg
Oct. 28	Mid-term Exam (3 hrs)	
<b>M W F</b> 20 25 27 Oct. Oct 30–Nov 5 – <i>Reading Week</i> 6  8 10 Nov. 13 15 17 20 22 24 27 29 1 Dec. 4  6  8	9. Lipids and Biological Membranes 10. Lipoproteins 11. Carbohydrate Structure 12. Fundamental concepts in metabolism 13. Carbohydrate Metabolism 14. Citric Acid Cycle 15. Oxidative Phosphorylation 16. Lipid metabolism 17. Energy Metabolism in Diabetes 18. Nitrogen Metabolism	Boffa
Date TBA	Final Exam (3 hrs)	

## 7. Evaluation

Assessments for this course and associated due dates are as follows. Note that the assignment has multiple components, each with its own due date, as explained in a separate document.

<b>Assessment</b>	<b>Default Value (%)</b>	<b>Due Date</b>
Background quiz	2	Fri Sept 15
Quiz 1 (Topics 1-4)	3	Fri Sept 29
Quiz 2 (Topics 5-8)	3	Fri Oct 20
Quiz 3 (Topics 9-13)	3	Fri Nov 17
Quiz 4 (Topics 14-18)	3	Fri Dec 8
Assignment		
First Submission	4	Mon Oct 16
Evaluation of Peer Submissions	2	Wed Oct 25
Final Submission	10	Mon Nov 13
Midterm test (Topics 1-8)	35	Sat Oct 28
Final exam (Topics 9-18)	35	TBD

## Alternative weighting schemes

Your final grade for the course will be the highest of the grades calculated using the 4 possible weighting schemes in the table below (all numbers are percent of your overall grade).

Assessment	1	2	3	4
Background quiz	2	2	2	2
Quiz 1 (Topics 1-4)	3	3	0	0
Quiz 2 (Topics 5-8)	3	3	0	0
Quiz 3 (Topics 9-13)	3	0	3	0
Quiz 4 (Topics 14-17)	3	0	3	0
Assignment	16	16	16	16
Midterm test (Topics 1-8)	35	35	41	41
Final exam (Topics 9-18)	35	41	35	41

**Background Quiz:** The background quiz consists of questions designed to refresh your memory about key concepts relevant to Biochemistry that should have been covered in first-year Biology and Chemistry. The quiz will be available on OWL before the first day of classes and is due Friday September 15 at 11:55 pm. You can repeat the quiz as many times as you like before the deadline; only your best score will be counted.

**Quizzes 1-4:** These quizzes will consist of 10 multiple choice questions, and are intended to encourage students to keep up with the material throughout the term. The quizzes will be administered through the WileyPLUS platform that comes with the textbook. The quizzes will be available at 8:30 am on the Monday before they are due, and are due that Friday by 11:55 pm. Once started, students will have 20 minutes to do each quiz. Practice questions will be available for each topic. Note that the alternate weighting schemes (see below) allow students to achieve a high mark in the course even if none of the quizzes are completed.

**Assignment:** Collaboration is a necessary skill when working in science. Each student will be assigned to a team of 3 - 4, with teams posted to OWL on Monday, September 18. Students may not choose their teammates. Each team will prepare an infographic on a biochemistry-related topic. Detailed instructions, including marking rubrics and details of peer assessment, are provided in a separate document.

**Test and exam:** The 3-hour midterm test will cover Topics 1-8 and will be held Saturday, October 28 starting at 2:00 pm. The final exam will cover Topics 9-18 and will be scheduled by the Registrar's Office. Students should not make travel commitments before verifying when the final examination will be held through the Registrar's Student Centre interface.

Room assignments for the midterm test and final exam will be posted on the OWL course site. All students are responsible for determining where they are to write each examination and to appear at the designated room on time.

Students must provide their own pencils and erasers (pens are not allowed) for the examinations and they **MUST bring their Student ID card**. Electronic devices, including (but not limited to) calculators, cell phones, iPods, and "Smart" Watches are NOT allowed in the exam rooms.

Biochemistry 2288A exams consist, in part, of multiple-choice questions marked on Scantrons. This course uses software that will detect unusual coincidences in answer patterns that may indicate cheating. Students should note that discrepancies between answers circled on their exam and those recorded on their Scantron will not be adjusted.

## Late or missed evaluations

**Quizzes** – Late submissions of the Background Quiz or any of Quizzes 1 to 4 will not be accepted, and there will be no makeup quizzes. Note that the alternate weighting schemes (see above) allow students to achieve a high mark in the course even if none of the quizzes are completed.

**Assignment** – We will accept first or final submissions up to 72 hours past the deadline, but we will deduct 10% for every 24-hour period after the due date/time. If some members of a team are ill, then other members should complete the assignment without them.

Late submission of the evaluations of peer submissions will not be accepted.

**Test and exam** – Students who are unable to attend the midterm due to athletic or academic conflicts are expected to write a make-up test on Thursday Oct. 26. Students who know of a conflict in advance of the midterm must notify Dr. Boffa no later than Friday Oct. 20.

Students who miss the midterm and who meet the criteria for academic consideration set by their Dean's office will be able to write a make-up test after the Fall Study Break, with the date to be determined. Please submit documentation to your Dean's office and contact Dr. Boffa for details.

If you miss both the scheduled midterm and the make-up test you will be required to write a comprehensive final examination (Topics 1-18) worth the total value of both the midterm and final exams. You must obtain permission for this special exam from the office of your Dean and contact Dr. Boffa at least 3 weeks before the date of the final exam.

If you miss the Final Exam, please contact your faculty's Academic Counselling Office as soon as you are able to do so. They will assess your eligibility to write the Special Exam (the name given by the university to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see [http://www.registrar.uwo.ca/examinations/exam\\_schedule.html](http://www.registrar.uwo.ca/examinations/exam_schedule.html)).

**INC (Incomplete Standing):** If a student has been approved by the Academic Counselling Office (in consultation with the instructor/department) to complete term work at a later date, an INC will be assigned. Students with INC will have their course load in subsequent terms reduced to allow them to complete outstanding course work. Students may request permission from Academic Counselling to carry a full course load for the term the incomplete course work is scheduled.

**SPC (Special examination):** If a student has been approved by the Academic Counselling Office to write a Special Examination and the final exam is the only outstanding course component, an SPC will be assigned. If the class has a makeup exam, the student is expected to write the makeup exam. If the class doesn't have a makeup exam or the student misses the makeup exam for reasons approved by the Academic Counselling Office, the student will write the exam the next time the course is offered. Outstanding SPCs will reduce the course load for the term the exam is deferred as outlined in [Types of Examinations](#) policy.

Click [here](#) for a detailed and comprehensive set of policies and regulations concerning examinations and grading. The table below outlines the University-wide grade descriptors.

A+	90-100	One could scarcely expect better from a student at this level
A	80-89	Superior work which is clearly above average
B	70-79	Good work, meeting all requirements, and eminently satisfactory
C	60-69	Competent work, meeting requirements
D	50-59	Fair work, minimally acceptable
F	below 50	Fail

## 8. Resources

Required Textbook: Essential Biochemistry, Fifth Edition by Charlotte Pratt & Kathleen Cornely, published by Wiley Inc. This book is available online through WileyPlus, or as a physical book; to purchase either, inquire at the campus bookstore. Refer to the OWL site for the required readings for each topic.

Lecture slides in both PowerPoint and PDF formats will be posted to OWL in advance of the lectures. Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian copyright laws.

## 9. Communication

Information and announcements related to the course will be communicated through OWL or using a student's Western University email address. Students are expected to check the OWL site regularly and their email at least every 48 hours. This course will use the **Forum** on the OWL site for all course-related queries so that everyone can access the queries and responses. Students' names are not visible to other students. Please keep your interactions friendly and respectful. For confidential matters, students may email Dr. Boffa directly. Posts to the forum or emails will receive a response within 2 business days, if not sooner.

## 10. How to Be Successful in this Class:

Students enrolled in this class should understand the level of autonomy and self-discipline required to be successful.



1. Invest in a planner or application to keep track of your courses. Populate all your deadlines at the start of the term and schedule your time throughout the course.
2. Make it a daily habit to log onto OWL to ensure you have seen everything posted to help you succeed in this class.
3. Read the recommended textbook material in advance of the lecture. This practice will make it much easier to follow along during the lecture.
4. Use the posted lecture slides as a template to add your own notes during lectures. You can either print them out for this purpose or utilize a tablet. Resist the urge to transcribe the instructors' words verbatim as this interferes with your ability to process the information.
5. Connect with others. Try forming an online study group and try meeting on a weekly basis for study and peer support.
6. Do not be afraid to ask questions. If you are struggling with a topic, check the online discussion boards or contact your instructors and/or teaching assistants. Office hours are also a great way to obtain 1 on 1 assistance from your instructors.
7. Reward yourself for successes. It seems easier to motivate ourselves knowing that there is something waiting for us at the end of the task.

## 11. Professionalism and Privacy

Western students are expected to follow the [Student Code of Conduct](#). Additionally, the following expectations and professional conduct apply to this course:



- ☒ All course materials created by the instructor(s) are copyrighted and cannot be sold/shared (e.g., Must Knows Facebook group, Course Hero, Chegg, etc.)
- ☒ Recordings are not permitted (audio or video) without explicit permission
- ☒ Permitted recordings are not to be distributed
- ☒ Students will be expected to take an academic integrity pledge before some assessments

Western is committed to providing a learning and working environment that is free of harassment and discrimination. All **students**, staff, and faculty have a role in this commitment and have a responsibility to ensure and promote a safe and respectful learning and working environment. Relevant policies include Western's [Non-Discrimination/Harassment Policy](#) (M.A.P.P. 1.35) and [Non-Discrimination/Harassment Policy – Administrative Procedures](#) (M.A.P.P. 1.35).

Any **student**, staff, or faculty member who experiences or witnesses' behaviour that may be harassment or discrimination **must report the behaviour** to the Western's [Human Rights Office](#). Harassment and discrimination can be human rights-based, which is also known as EDI-based, (sexism, racism, transphobia, homophobia, islamophobia, xenophobia, antisemitism, and ableism) or non-human rights-based (personal harassment or workplace harassment).

## 12. Western Academic Policies and Statements

### Absence from Course Commitments

#### A. Absence for medical illness:

Students must familiarize themselves with the [Accommodation for Illness Policy](#).

A student seeking academic accommodation for any **work worth less than 10%** must contact the instructor or follow the appropriate Department or course specific instructions provided on the course outline. Instructors will use good judgment and ensure fair treatment for all students when considering these requests. You are not required to disclose details about your situation to your instructor; documentation is not required in this situation, and you should not send any pictures to your instructor.

If you are unable to meet a course requirement for any **work worth 10% or greater** due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Academic Counseling as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. Please note that the format of a make-up test, exam, or assignment is at the discretion of the course coordinator.

A student requiring academic accommodation due to illness should use the Student Medical Certificate when visiting an off-campus medical facility or request a Record's Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found at: [http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf)

#### B. Absence for non-medical reasons:

Student absences might also be approved for non-medical reasons such as religious holidays and compassionate situations. Please review the policy on [Accommodation for Religious Holidays](#). All non-medical requests must be processed by Academic Counselling. Not all absences will be approved; pay attention to the academic calendar and final exam period when booking any trips.

#### C. Special Examinations

A Special Examination is any examination other than the regular examination, and it may be offered only with the permission of the Dean of the Faculty in which the student is registered, in consultation with the instructor and Department Chair. Permission to write a Special Examination may be given on the basis of compassionate or medical grounds with appropriate supporting documents. To provide an opportunity for students to recover from the circumstances resulting in a Special Examination, the University has implemented Special Examinations dates. These dates as well as other important information about examinations and academic standing can be found [here](#).

## **Academic Offenses**

Scholastic offences are taken seriously, and students are directed [here](#) to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence.

## **Accessibility Statement**

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Accessible Education (AE) at 661-2111 x 82147 for any specific question regarding an accommodation or review [The policy on Accommodation for Students with Disabilities](#)

## **Correspondence Statement**

The centrally administered **e-mail account** provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner. You can read about the privacy and security of the UWO email accounts [here](#).

## **Discovery Credit Statement**

Students are permitted to designate up to 1.0 Discovery Credit course (or equivalent) for pass/fail grading that can be counted toward the overall course credits required for their degree program. The details of this policy and the deadlines can be found [here](#).

## **Turnitin and other similarity review software**

All assignments will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. Students will be able to view their results before the final submission. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between Western University and [Turnitin.com](#).

## **15% Rule**

According to the [Evaluation of Academic Performance](#) policy, at least three days prior to the deadline for withdrawal from a 1000- or 2000-level course without academic penalty, students will receive assessment of work accounting for at least 15% of their final grade. Generally, students can expect some form of feedback on their performance in a course before the drop date. In rare instances, at the Dean's discretion, an exemption can be issued, which also must be noted in the course syllabus. Deans should review exemptions on a course-by-course basis each time an exempted course is offered.

# **13. BMSUE Academic Policies and Statements**

## **Cell Phone and Electronic Device Policy (for in-person tests and exams)**

The Schulich School of Medicine & Dentistry is committed to ensuring that testing and evaluation are undertaken fairly across all our departments and programs. For all tests and exams, it is the policy of the School that any electronic devices, e.g., cell phones, tablets, cameras, smart glasses, smart watch or iPod are strictly prohibited. These devices **MUST** be left either at home or with the student's bag/jacket at the front of the room and **MUST NOT** be at the test/exam desk or in the individual's pocket. Any student found with one of these prohibited devices will receive a grade of zero on the test or exam. Non-

programmable calculators are only allowed when indicated by the instructor. The program is not responsible for stolen/lost or broken devices.

### **Copyright and Audio/Video Recording Statement**

Course material produced by faculty is copyrighted and to reproduce this material for any purposes other than your own educational use contravenes Canadian Copyright Laws. You must always ask permission to record another individual and you should never share or distribute recordings.

### **Rounding of Marks Statement**

Across the Basic Medical Sciences Undergraduate Education programs, we strive to maintain high standards that reflect the effort that both students and faculty put into the teaching and learning experience during this course. All students will be treated equally and evaluated based only on their actual achievement. **Final grades** on this course, irrespective of the number of decimal places used in marking individual assignments and tests, will be calculated to one decimal place and rounded to the nearest integer, e.g., 74.45 becomes 74, and 74.50 becomes 75. Marks WILL NOT be bumped to the next grade or GPA, e.g., a 79 will NOT be bumped up to an 80, an 84 WILL NOT be bumped up to an 85, etc. The mark attained is the mark you achieved, and the mark assigned; requests for mark “bumping” will be denied.

### **Statement on the use of ChatGPT and other Artificial Intelligence (AI) Platforms**

Within this course, students are permitted to use AI tools exclusively for information gathering and preliminary research purposes. These tools are intended to enhance the learning experience by providing access to diverse information sources. However, you should note that the material generated by these programs may be inaccurate, incomplete, or otherwise problematic. It is essential that students critically evaluate the obtained information, exercise independent thinking, and engage in original research to synthesize and develop their own ideas, arguments, and perspectives. The use of AI tools can serve as a starting point for exploration, with students expected to uphold academic integrity by appropriately attributing all sources and avoiding plagiarism. Assignments should reflect the students' own thoughts and independent written work. By adhering to these guidelines, students contribute to a responsible and ethical learning environment that promotes critical thinking, independent inquiry and allows them to produce original written contributions.

## **14. Support Services**

The following links provide information about support services at Western University.

[Academic Counselling \(Science and Basic Medical Sciences\)](#)

[Appeal Procedures](#)

[Registrarial Services](#)

[Student Development Services](#)

[Student Health Services](#)