

<b>Course ID:</b>	<b>Course Title:</b>	<b>Fall 2023</b>
<b>BCH 297</b>	<b>Biochemistry</b>	<b>Prerequisite: BIO 131, BIO 133, and CHE 251</b>
		<b>Credits: 3</b>

Class Information		Instructor Information		Important Dates	
<b>Delivery:</b>	In Class	<b>Instructor:</b>	Dr. Kristian Caldo	<b>First Day of Class:</b>	Sept. 06
<b>Days:</b>	Tue/ Thu	<b>Email:</b>	<a href="mailto:kristian.caldo@ambrose.edu">kristian.caldo@ambrose.edu</a>	<b>Last Day to Add/Drop:</b>	Sept. 17
<b>Time:</b>	2:30 – 3:45 PM	<b>Phone:</b>	(403) 407-9492	<b>Last Day to Withdraw:</b>	Nov. 20
<b>Room:</b>	L2084	<b>Office:</b>	A2156	<b>Last Day to Apply for Coursework Extension:</b>	Nov. 23
<b>Lab/Tutorial:</b>	Instructor: Dr. Olumuyiwa Igbalajobi E-mail: <a href="mailto:olumuyiwa.igbalajobi@ambrose.edu">olumuyiwa.igbalajobi@ambrose.edu</a> Time: Monday 8:00-11:00 AM (3 hrs/week) Room: A2151	<b>Office Hours:</b>	Th: 10:00am-11:00am Wed: 11:00am-12:00 pm Please e-mail me to set an appointment outside office hours.	<b>Last Day of Class:</b>	Dec. 11
<b>Final Exam:</b>	Date: Saturday, Dec. 16, 2023 Time: 1-4 pm Location: L2084				

### Important Dates and Information

For a list of all important dates and information regarding participating in classes at Ambrose University, please refer to the Academic Calendar at <https://ambrose.edu/2023-2024-academic-schedule>.

### Course Description

Biochemistry explores the chemical makeup and reactions that are essential for life processes. This course will introduce students the structure and function of carbohydrates, amino acids, proteins, lipids, and enzymes, along with an introduction to metabolism. The course tutorial and laboratory components will introduce students to some fundamental biochemistry experiments and aid in the comprehension of the concepts covered during lectures.

### Expected Learning Outcomes

It is the aim of the course that students acquire the following skills:

1. Understand the structure, function, and biochemistry of important biological macromolecules.
2. Understand the principles of enzymatic activities and analysis.
3. Comprehend various metabolic pathways and appreciate their complexity, network, and regulation.

4. Connect metabolic pathways and biomolecules to common metabolic diseases.

### Textbooks

- David Nelson and Michael Cox. 2021. Lehninger Principles of Biochemistry 8<sup>th</sup> Edition. Macmillan Learning.
  - ISBN: 9781319230906
- It is required to sign up for **Top Hat** in-class response system at <https://app.tophat.com/register/>
  - Course code: 248582
  - Top Hat app is also available for download in your iPhone and Android device.

### Course Schedule

*The following schedule provides a general guideline and timetable for topics and tests. It may change depending on the progress throughout the semester.*

Date	Tentative Schedule	Readings (Lehninger 8 <sup>th</sup> Ed.)
Sept. 07	Introduction to BCH 297; Topic 1 – pH and Buffers	Ch. 2
Sept. 12	Topic 1 – pH and Buffers	Ch. 2
Sept. 14	Topic 2 – Amino Acids and Peptides	Ch. 3
Sept. 19	Topic 2 – Amino Acids and Peptides	Ch. 3
Sept. 21	Topic 3 – Protein Purification Methods	Ch. 3
Sept. 26	Topic 3 – Protein Purification Methods	Ch. 3
Sept. 28	Topic 4 – Protein Structure	Ch. 3
Oct. 03	Topic 4 – Protein Structure	Ch. 3
Oct. 05	Topic 4 – Protein Structure	Ch.4
Oct. 10	Topic 5 – Proteins Function	Ch. 5
Oct. 12	<b>In-Class Term Test 1 (Topic 1 to 4)</b>	
Oct. 17	Topic 5 - Protein Function	Ch. 5
Oct. 19	Topic 6 – Enzymes	Ch. 5
Oct. 24	Topic 6 – Enzymes	Ch. 5
Oct. 26	Topic 6 – Enzymes	Ch. 6
Oct. 31	Topic 6 – Enzymes	Ch. 6
Nov. 02	Topic 7 – Carbohydrates	Ch. 6
Nov. 07	<i>No Class due to Fall Reading Week</i>	
Nov. 09	<i>No Class due to Fall Reading Week</i>	

<b>Nov. 14</b>	Topic 7 – Carbohydrates	Ch. 7
<b>Nov. 16</b>	Topic 7 – Carbohydrates	Ch. 7
<b>Nov. 21</b>	<b>In-Class Term Test 2 (Topic 5 + 6)</b>	
<b>Nov. 23</b>	Topic 7 – Carbohydrates	Ch. 6
<b>Nov. 28</b>	Topic 7 – Carbohydrates	Ch. 7
<b>Nov. 30</b>	Topic 8 – Metabolism	Ch. 7
<b>Dec. 05</b>	Topic 8 - Metabolism	Ch. 13
<b>Dec. 07</b>	Topic 8 - Metabolism	Ch. 11

**Laboratory Schedule:**

<b>Week of</b>	<b>Laboratory of the Week</b>
<b>Sept. 11</b>	Lab Orientation Review 1: Buffer Preparation
<b>Sept. 18</b>	Review 2: Titration of a Weak Acid – Amino Acid
<b>Sept. 25</b>	Lab 1: Experimental Design to Purify Taq Polymerase
<b>Oct. 02</b>	Lab 2: Purification of Taq Polymerase <i>Purification Protocol Due</i>
<b>Oct. 09</b>	No lab (Thanksgiving)
<b>Oct. 16</b>	Lab 3: Dialysis of the Purified Taq Polymerase
<b>Oct. 23</b>	Lab 4: Quantitation Analysis of Taq by Bradford Assay
<b>Oct. 30</b>	Lab 5: Qualification Analysis of Taq by SDS-PAGE Electrophoresis <i>Material and Methods for Dialysis Due</i>
<b>Nov. 06</b>	<i>No Lab due to Fall Reading Week</i>
<b>Nov. 13</b>	Lab 6 (Part 1): Functional (Enzymatic) Analysis of Taq by Polymerase Chain Reaction
<b>Nov. 20</b>	Lab 7: Bioinformatics - Protein Sequence Analysis ▪ In this lab session, we will also run the agarose gel to analyze the products from PCR reactions in the week of Nov. 13 <i>Material and Methods and Results for Protein Concentration Due</i>
<b>Nov. 27</b>	Open Lab Session <i>Material and Methods and Results for Purity Analysis Due</i>
<b>Dec. 04</b>	<i>Material and Methods and Results for Enzymatic Activity Due</i>
<b>Dec. 11</b>	<i>Lab Report Due</i>

## Assessment and Evaluation:

	Evaluation Methods	Due Date	Weight
Lab (25%)	Lab quiz and assignments	Multiple	10%
	Lab report	Dec. 11, 2023	15%
Lecture (75%)	Moodle assignments	Multiple	15%
	Term Test 1	Oct. 12, 2023	15%
	Term Test 2	Nov. 21, 2023	15%
	Final exam (cumulative)	Date: Dec. 16, 2023 (Sat) Time: 1-4 pm Location: L2084	30%
	Total		100%

### **Lab Report: (15%):**

- group work
- maximum 10 double-spaced pages with typing font of 11-12 size
- submit through Turnitin via Moodle
- assignment is due on the day assigned and attendance for all lab work is required to receive the marks
- the week after the experiment, each group is expected to submit a “draft” write up on protocol, material and methods, result, and discussion of the experiments performed and the lab instructor will provide feedback
- a penalty of deducting 15% each day will be applied for late assignment submission.

### **Midterm Exams: (15% each)**

- focus on understanding the biological concepts rather than detail memorization
- NO make-up or deferred exam unless evidence of legitimate excuse, such as doctor’s notes, is presented

### **Final Exam: (30%)**

- is *comprehensive* with concentration (~80%) on the materials covered after the midterm

### **Attendance:**

Regular attendance will be essential for success on all exams and assignments. No points will be subtracted from your grade for non-attendance. However, in-class assignments and any in-class graded activities cannot be made up and, **if missed, will receive a grade of zero.**

- **Laboratory attendance is mandatory.**
- Attendance is required to obtain marks for in-class or in-lab assignments

## Grade Summary:

Percent (%) to Letter Grade Conversion	Grade	Grade Point	Description
95.00% - 100%	A+	4.0	Excellent
87.00% - 94.99%	A	4.0	
80.00% - 86.99%	A-	3.7	
77.00% - 79.99%	B+	3.3	Good
73.00% - 76.99%	B	3.0	
70.00% - 72.99%	B-	2.7	
67.00% - 69.99%	C+	2.3	Satisfactory
63.00% - 66.99%	C	2.0	
60.00% - 62.99%	C-	1.7	
55.00% - 59.99%	D+	1.3	Minimal Pass
50.00% - 54.99%	D	1.0	
00.00% - 49.99%	F	0	
			Fail

Because of the nature of the Alpha 4.00 system, there can be no uniform University-wide conversion scale. The relationship between raw scores (e.g. percentages) and the resultant letter grade will depend on the nature of the course and the instructor's assessment of the level of each class, compared to similar classes taught previously.

Please note that final grades will be available on student registration system. Printed grade sheets are not mailed out.

## Classroom Etiquette

### Electronic Devices

Although computers and tablets can be used in the class for taking lecture notes, cell phone usage is not permitted. Please turn cellular phones off - it is very distracting to hear someone's phone go off in class. Texting and movie watching are prohibited in class.

### Attend every class

You will find that students who attend every class, listen to the instructor and take good notes will be more likely to pass (with a higher grade). If you have an emergency or illness, please contact me ahead of time to let me know that you will be absent.

Important note: if you miss a class it is your responsibility to meet with the instructor, outside of regular class time, to determine a plan to make up the missed work.

### Get to Class On Time

Students, who walk into the classroom late or leave early, distract other students and disrupt the learning environment.

### Do Not Have Private Conversations

The noise is distracting to other students. Also, talking to classmates during lecture and presentations disrupts the normal learning environment.

## **Do Not Get Up and Walk Out Halfway Through the Class**

It disturbs people and gives the unmistakable impression that you don't respect the class, the other students or the instructor. The instructor has the right to finish his or her thought at the end of the class period and conclude the class in an orderly fashion without people standing up and walking out

## **Your Classmates Deserve Your Respect and Support**

Others may have different ideas and opinions from yours, they may ask questions you perceive to be "stupid," but they deserve the same level of respect from you as you wish from them.

## **Academic Misconducts:**

Please refer to Ambrose Undergraduate Academic Calendar <https://ambrose.edu/undergrad-academic-calendar/academic-information/academic-misconduct>

### **Plagiarism:**

Plagiarism is a very serious academic offence that involves presenting work in a course as if it were the result of one's own study and investigation when, in fact, it is the work of someone else. Plagiarism takes place when:

- an essay or other work is copied from another source, including your peer's work, and submitted as one's own
- parts of a work, including words, ideas, images or data, are taken from a source without acknowledgement of the originator
- work presented for one course is also submitted for another course without prior agreement of the instructors involved
- another person prepares the work that is submitted as one's own
- substantial editorial or compositional assistance from another person is received on work that is submitted as one's own

### **Cheating:**

Cheating is also a very serious academic offence. Cheating on examinations, assignments and/or labs may take a number of forms, including:

- tampering or attempting to tamper with examination scripts, class work, grades or class records
- obtaining unauthorized assistance from anyone during the course of an examination
- impersonating another student during examinations
- falsifying or fabricating lab reports
- communicating with other students during an examination
- bringing unauthorized written material or electronic devices to an examination
- possessing, distributing, or attempting to possess or distribute unauthorized material in respect to examinations
- attempting to read the examination papers of other students
- deliberately exposing one's own examination papers to another student

## **Ambrose University Important Information:**

## **Ambrose University Important Policies & Procedures:**

### **Registration**

Registration is the process of selecting and enrolling in classes for upcoming semesters. Only students who are registered will be permitted to attend class and receive a grade for the course. You are responsible for ensuring that the courses you take are appropriate for your program, that they do not have any scheduling conflicts, that they have the necessary prerequisites and that they meet all degree requirements.

### **Withdrawal From A Course**

Prior to the Add/Drop deadline: through the student registration system whereby course(s) will be removed with no academic or financial penalty. After the Add/Drop deadline and until the Withdrawal deadline: through submission of the 'Withdrawal from Course' form whereby course(s) will remain on the permanent academic record/transcript with the symbol 'W'. (See [ambrose.edu/registrar/request-forms](http://ambrose.edu/registrar/request-forms).) Students who withdraw from more than 30 credits attempted at Ambrose University will be required to withdraw from their program. Students considering withdrawing from courses are encouraged to discuss with their Faculty Advisor and/or the Office of the Registrar questions relating to their withdrawal decision specifically relating to financial assistance, study permit requirements, prerequisites for subsequent courses, readmission, and/or graduation timeline. Students who do not formally withdraw from a course are still considered registered in the course, even if they are no longer attending classes. In this case, students will be assigned a grade based on coursework completed as per the course syllabus and are responsible to pay the tuition and fees assessed for the course. Under extenuating circumstances, students may request from the Office of the Registrar a course(s) withdrawal after the Withdrawal deadline and until the last day of classes. Extenuating circumstances typically consider situations such as medical emergencies, compassionate grounds, or unforeseen conditions/situations beyond the students' control that arise after the start of the semester and are considered on a case-by-case basis. Supporting documentation from a physician or Registered Health Professional must accompany this request.

### **Coursework Extensions**

Should a request for a time extension on coursework exceed the end of the term, a *Coursework Extension Application* must be completed and submitted to the Office of the Registrar. The extension (if granted) will be recorded on the student record. Extensions are granted at the discretion of the instructor and registrar. If granted, time extensions do not excuse you from a final examination where one has been scheduled for the course. More conditions apply.

### **Exam Scheduling**

Students who find a conflict in their exam schedule must submit a *Revised Final Exam Time Application* to the Office of the Registrar by the deadline noted in the Academic Calendar. Requests will be considered for the following reasons only: 1) the scheduled final examination slot conflicts with another exam; or 2) the scheduled final examination slot results in three consecutive examination

periods. Travel is not considered a valid excuse for re-scheduling or missing a final exam.

### **Communication**

Your Ambrose email account is the University's primary and official mode of communication with you. Information delivered to your Ambrose email is considered official notification. Ambrose University is not responsible for your failure to receive important information delivered to your Ambrose email.

### **Lecture Recording**

The recording of lectures or any other classroom academic activity, other than an audio recording as an accommodation, is prohibited except at the discretion of the instructor. Any use other than that agreed upon with the instructor constitutes academic misconduct and may result in suspension or expulsion. Permission to allow a lecture recording is not a transfer of any copyrights, so such recordings may be used only for individual or group study with other students enrolled in the same class and may not be reproduced, transferred, distributed or displayed in any public or commercial manner. Student must destroy recordings in any, and all formats at the end of the semester in which they are enrolled in the class. All students recording lectures, must sign the Permission Form to audio record lectures which is available through the Office of the Registrar.

### **Standards of Behaviour in the Classroom Setting**

Learning is an active and interactive process, a joint venture between student and instructor and between student and student. Some topics covered within a class may lead to strong reactions and opinions. It is important that Students understand that they are entitled to hold contradictory beliefs and that they should be encouraged to engage with these topics in a critical manner. Committing to this type of "active learning" significantly increases the learning experience for both teacher and student, and reflects the Christian imperative to pursue truth, which lies at the heart of the Ambrose educational experience. However, active discussion of controversial topics will be undertaken with respect and empathy, which are the foundations of civil discourse in the Classroom Setting. Primary responsibility for managing the classroom rests with the instructor. The instructor may direct a student to leave the class if the student engages in any behaviour that disrupts the classroom setting. If necessary, Ambrose security will be contacted to escort the student from class.

### **Academic Integrity**

We are committed to fostering personal integrity and will not overlook breaches of integrity such as plagiarism and cheating. Academic dishonesty is taken seriously at Ambrose University as it undermines our academic standards and affects the integrity of each member of our learning community. Any attempt to obtain credit for academic work through fraudulent, deceptive, or dishonest means is academic dishonesty. Plagiarism involves presenting someone else's ideas, words, or work as one's own. Plagiarism is fraud and theft, but plagiarism can also occur by accident when a student fails or forgets

to acknowledge to another person's ideas or words. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or immediate dismissal from the university. Students are expected to be familiar with the policies in the current Academic Calendar that deal with plagiarism, cheating, and the penalties and procedures for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean and become part of the student's permanent record.

### Academic Policies

It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Academic Calendar. The academic calendar can be found at <https://ambrose.edu/academics/academic-calendar>

### Privacy

Personal information (information about an individual that may be used to identify that individual) may be required as part of taking this class. Any information collected will only be used and disclosed for the purpose for which the collection was intended. For further information contact the Privacy Compliance Officer at [privacy@ambrose.edu](mailto:privacy@ambrose.edu).

## Academic Success and Supports

### Accessibility Services

Academic accommodation is provided to Ambrose students with disabilities in accordance with the Alberta Human Rights Act and the Canadian Charter of Rights and Freedoms. Provision of academic accommodation does not lower the academic standards of the university nor remove the need for evaluation and the need to meet essential learning outcomes. Reasonable accommodations are tailored to the individual student, are flexible, and are determined by considering the barriers within the unique environment of a postsecondary institution. It can take time to organize academic accommodations and funding for disability-related services. Students with a disability who wish to have an academic accommodation are encouraged to contact Accessibility Services as early as possible to ensure appropriate planning for any needs that may include accommodations. Staff can then meet with students to determine areas to facilitate success, and if accommodations are required, ensure those accommodations are put in place by working with faculty.

### Learning Services

Learning Services provides support with

- **research and communication skills** (e.g., writing a paper, researching, giving a presentation), and
- **subject-specific skills** (e.g., solving a chemistry problem, reconciling a general ledger, understanding a philosophical argument).

We offer workshops, one-to-one tutoring, and more, and all of our services are **free** to students currently enrolled at Ambrose University. To learn more, please visit <https://ambrose.edu/sas/learning-services>.

### Mental Health Support

All of us need a support system. We encourage students to build mental health supports and to reach out when help is needed.

#### On Campus:

- Counselling Services: [ambrose.edu/counselling](https://ambrose.edu/counselling)
- For immediate crisis support, there are staff on campus who are trained in Suicide Intervention Skills and can help you access mental health support. See <https://ambrose.edu/student-life/crisissupport> for a list of staff members.
- For additional wellness resources go to the Ambrose wellness page: <https://ambrose.edu/wellness>

#### Off Campus:

- Distress Centre - 403-266-4357
- Alberta Mental Health Helpline - 1-877-303-2642 (Toll free)
- Sheldon Chumir Health Care Centre - 403-955-6200
- Emergency - 911

### Sexual Violence Support

We are committed to supporting students who have experienced gender based sexual violence in the past or while at Ambrose. Many of the staff, faculty, and student leaders have received Sexual Violence Response to Disclosure training. We will support you and help you find the resources you need and you can access information about reporting. Information about the Sexual Violence policy and on and off campus supports can be found on our website— [ambrose.edu/sexual-violence-response-and-awareness](https://ambrose.edu/sexual-violence-response-and-awareness).

#### Off Campus:

- Alberta's Oneline for Sexual Violence - 1-866-403-8000 call or text
- Clinic: Sheldon Chumir Health Centre - 403-955-6200
- Calgary Communities Against Sexual Abuse - 403-237-5888
- Chat: [www.calgarycasa.com](http://www.calgarycasa.com)

**Note:** Students are strongly advised to retain this syllabus for their records.