Course ID:	Course Title:	Fall 2019
BCH 297	~~Introduction to~~ Biochemistry I	Prerequisite: BIO 131, BIO 133, CHE 251
		Credits: 3

Class Information		Instructor Information		Important Dates	
Days:	Tuesday and Thursday	**Instructor:**	Dr. Chris Wang	**First day of classes:**	Wed, Sept 4
Time:	1:00 – 2:15 PM	**Email:**	chris.wang@ambrose.edu	**Last day to add/drop, or change to audit:**	Sun, Sept 15
Room:	A2210	**Phone:**	(403) 410-2000 ext. 6910	**Last day to request revised exam:**	Fri, Nov 1
Lab/ Tutorial:	~3 hours/week	**Office:**	L2113	**Last day to withdraw from course:**	Mon, Nov 18
	Thursday (8:15-11 AM) A2151	**Office Hours:**		**Last day to apply for coursework extension:**	Mon, Nov 25
Final Exam:	9-11 AM on Dec. 20 (Friday) in A2210			**Last day of classes:**	Wed, Dec 11

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.

Require Textbook:

▪ Dean R. Appling, Spencer J. Anthony-Cahill, and Christopher K. Mathews. Biochemistry: Concepts and Connections. 2nd Edition. Pearson Education, Inc.

Require Resource:

▪ Mastering Chemistry

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	Lecture Topic	Readings (Appling *et. al.*)
	Laboratory of the Week	
Sept. 05	Introduction to BCH 297 ◦ introduction to biomolecules (DNA, carbohydrate, protein, and lipid) of life	
Sept. 10	Topic 1 – The Chemical Foundation of Life: ◦ aqueous chemistry ◦ chemical bonds ◦ water - main chemicals of life and the importance of water in biochemistry ◦ buffer and pH	Ch. 2
	Tutorial: Buffer Solution	
Sept. 12	continuation on Topic 1 - The Chemical Foundation of Life	Ch. 2
Sept. 17	continuation on Topic 1 - The Chemical Foundation of Life Topic 2 – Introduction to Proteins: ◦ amino acids – the building blocks of proteins ◦ peptide bond and protein polypeptides ◦ there are four different levels of protein structure ◦ protein primary structure determines all higher levels of protein structure	Ch. 2 Ch. 5
	Tutorial: Assignment 1	
Sept. 19	Continuation on Topic 2 - Introduction to Proteins	Ch. 5
	Continuation on Topic 2 - Introduction to Proteins	Ch. 5

Sept. 24	*No lab due to Spiritual Emphasis Day* ~~Lab 1A: Experimental Design to Purify *Taq* Polymerase~~	
Sept. 26	*No class due to Spiritual Emphasis Day*	
Oct. 01	Continuation on Topic 2 - Introduction to Proteins	Ch. 5
	Lab 1A: Experimental Design to Purify *Taq* Polymerase ~~Lab 1B: Purification of *Taq* Polymerase~~	
Oct. 03	Topic 3 - The Three-Dimensional Structure of Proteins: ◦ two types of secondary structure elements. ◦ tertiary structure is the highest level of structure for monomeric proteins ◦ quaternary structure is the highest level of structure for oligomeric proteins	Ch.6
Oct. 08	Continuation on Topic 3 - The Three-Dimensional Structure of Proteins	Ch. 6
	Lab 1B: Purification of *Taq* Polymerase ~~Lab 2: Dialysis of Purified *Taq* Polymerase~~	
Oct. 10	**In-Class Midterm 1 (Topic 1 and 2)**	
Oct. 15	Continuation on Topic 3 - The Three-Dimensional Structure of Proteins	Ch. 6
	Lab 2: Dialysis of Purified *Taq* Polymerase ~~Lab 3: Determination of Protein Concentration~~	
Oct. 17	Continuation on Topic 3 - The Three-Dimensional Structure of Proteins	Ch. 6
Oct. 22	Topic 4 - Protein Function: ◦ protein structure is critical for protein function ◦ the relationship between protein structure and its function	Ch. 7
	Lab 3: Determination of Protein Concentration ~~Lab 4: Purity Analysis of the Purified *Taq* Polymerase by SDS-PAGE~~	
Oct. 24	Continuation on Topic 4 – Protein Function	Ch. 7
Oct. 29	Continuation on Topic 4 – Protein Function	Ch. 7
	Lab 4: Purity Analysis of the Purified *Taq* Polymerase by SDS-PAGE ~~Lab 5: Enzymatic Activity Assay of the Purified *Taq* Polymerase by PCR~~	
Oct. 31	Continuation on Topic 4 – Protein Function	Ch. 7
Nov. 05	Topic 5 – Bioenergetics: ◦ laws of thermodynamics ◦ energy in biological systems	Ch. 3
	Lab 5: Enzymatic Activity Assay of the Purified *Taq* Polymerase by PCR ~~Lab 6: Analyzing Protein Sequence Using Bioinformatic Tools~~	
Nov. 07	Continuation on Topic 5 – Bioenergetics	Ch. 3
Nov. 12	*Fall Modules/Mid-Semester break – No Class*	
	Fall Modules/Mid-Semester break – No Lab	

Nov. 14	*Fall Modules/Mid-Semester break – No Class*	
Nov. 19	**In-Class Midterm 2 (Topic 3 + 4)**	
	Lab 6: Analyzing Protein Sequence Using Bioinformatic Tools~~Lab Report Write-Up Discussion~~	
Nov. 21	Topic 6 – Enzymes: ◦ enzymes are proteins that catalyze chemical reactions ◦ enzymes bind substrates in their active sites and stabilize the transition state ◦ enzymes have specific requirements to achieve full activity ◦ enzymes can be kinetically characterized and can be inhibited	Ch. 8
Nov. 26	Continuation on Topic 6 - Enzymes	Ch. 8
	Lab Report Write-Up Discussion~~***Lab Exam and Lab Report Due***~~	
Nov. 28	Continuation on Topic 6 - Enzymes	Ch. 8
Dec. 03	Topic 7 – Carbohydrates: ◦ carbohydrates have the general formula $(CH_2O)_n$ ◦ monosaccharides are joined together via glycosidic bonds to form oligosaccharides and polysaccharides	Ch. 9
	Lab Exam and Lab Report	
Dec. 03	Continuation on Topic 7 - Carbohydrates	Ch. 9
Dec. 10	Topic 8 – Lipid: ◦ fatty acids can be covalently attached to glycerol or sphingosine to form lipids found in membranes ◦ lipids can be used as a source of fuel	Ch. 10
	Final Exam Review Session	CW

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Requirements:

Evaluation Methods	Due Date	Weighting
~~pre-topic learning~~	~~multiple~~	~~3%~~
assignments, case study, and quiz	multiple	~~7~~10%
lab report	Dec. 3, 2019~~Nov. 26, 2019~~	~~5~~10%
lab exam	~~Nov. 26~~Dec. 3, 2019	~~10~~10%
midterm Exam 1 (Topic 1 + 2)	Oct. 10, 2019	20%
midterm Exam 2 (Topic 3 + 4)	Nov. 19, 2019	20%
Final Exam (cumulative) 70-80% on new materials and 20-30% on materials covered in Midterm 1 and 2	9-11 AM on Dec. 20th (Friday) in A2210	~~35~~30%
Total		100%

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~~**Pre-Topic Learnings: (3%)**~~
~~• completed on **Mastering Chemistry**~~

Assignments: ~~**(7%)**~~
• most assignments are completed on **Mastering Chemistry**
• please refer to "Student_Registration_Handout_wang07379.pdf" for Mastering Chemistry registration
  ▫ hyperlink for registration: www.pearson.com/mastering
  ▫ instructor's course ID: **wang07379**
~~• in-class/-lab quiz is an individual work~~
~~• in-class/-lab or take-home assignment and case study can be worked in a group of 2-3 students~~
~~*e.g.* critical thinking questions, problem solving questions, simple experimental design~~
• assignment and case study are due on the day assigned and attendance is required to receive the marks if it is to be completed in class or in lab
• NO deferred assignment will be accepted

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Lab Report: ~~**(5**~~**10%)**
• individual work
• maximum 10 double spaced pages with typing font of 11-12 size
• 10% penalty per day for late submission
• only accept hard copy (emailed assignments will not be accepted)

Midterm Exams: ~~**(20% each)**~~
• only materials covered in the lectures will be tested
• 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: ~~**(35**~~**30%)**
• is *comprehensive* with concentration (~80%) on the materials covered after the midterm

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info@ambrose.edu
ambrose.edu

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!
- laboratory/tutorial attendance will be taken. Students need to attend 60% of the assigned laboratory/tutorial sessions to pass the course
- attendance is required to obtain in-class or in-lab assignments

Grade Summary:

Percent (%) to Letter Grade Conversion	Grade	Grade Point	Description
92.00% - 100%	A+	4.0	Excellent
85.00% - 91.99%	A	4.0	
80.00% - 84.99%	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	
50.00% - 54.99%	D	1.0	Minimal Pass
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.

Other:

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.

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 Academic Policies:

Communication
All students have received an Ambrose e-mail account upon registration. It is the student's responsibility to check this account regularly as the Ambrose email system will be the professor's instrument for notifying students of important matters (cancelled class sessions, extensions, requested appointments, etc.) between class sessions. If students do not wish to use their Ambrose accounts, they will need to forward all messages from the Ambrose account to another personal account.

Registration
During the **Registration Revision Period** students may enter a course without permission, change the designation of any class from credit to audit and /or voluntary withdraw from a course without financial or academic penalty or record. Courses should be added or dropped on the student portal by the deadline date; please consult the List of Important Dates. After that date, the original status remains and the student is responsible for related fees.
Students intending to withdraw from a course after the Registration Revision Period must apply to the Office of the Registrar by submitting a "Request to Withdraw from a Course" form or by sending an email to the Registrar's Office by the **Withdrawal Deadline;** please consult the List of Important Dates on the my.ambrose.edu website. Students will not receive a tuition refund for courses from which they withdraw after the Registration Revision period. A grade of "W" will appear on their transcript.

Students wishing to withdraw from a course, but who fail to do so by the applicable date, will receive the grade earned in accordance with the course syllabus. A student obliged to withdraw from a course after the Withdrawal Deadline because of health or other reasons may apply to the Registrar for special consideration.

Exam Scheduling
Students, who find a conflict in their exam schedule must submit a Revised Examination Request form to the Registrar's Office by the deadline date; please consult the List of Important Dates. Requests will be considered for the following reasons only: 1) the scheduled final examination slot conflicts with another exam; 2) the student has three final exams within three consecutive exam time blocks; 3) the scheduled final exam slot conflicts with an exam at another institution; 4) extenuating circumstances. Travel is not considered a valid excuse for re-scheduling or missing a final exam.

Electronic Etiquette
Students are expected to treat their instructor, guest speakers, and fellow students with respect. It is disruptive to the learning goals of a course or seminar and disrespectful to fellow students and the instructor to use electronics for purposes unrelated to the course during a class session. Turn off all cell phones and other electronic devices during class. Laptops should be used for class-related purposes only. Do not use iPods, MP3 players, or headphones. Do not text, read, or send personal emails, go on Facebook or other social networks, search the internet, or play computer games during class. Some professors will not allow the use of any electronic devises in class. The professor has the right to disallow the student to use a laptop in future lectures and/or to ask a student to withdraw from the session if s/he does not comply with this policy. Repeat offenders will be directed to the Dean. If you are expecting communication due to an emergency, please speak with the professor before the class begins.

Academic Policies
It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Academic Calendar. 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.

Extensions
Although extensions to coursework in the semester are at the discretion of the instructor, students may not turn in coursework for evaluation after the last day of the scheduled final examination period unless they have received permission for a course Extension from the Registrar's Office. Requests for course extensions or alternative examination time must be submitted to the Registrar's Office by the deadline date; please consult the List of Important Dates. Course extensions are only granted for serious issues that arise "due to circumstances beyond the student's control."

Appeal of Grade
An appeal for change of grade on any course work must be made to the course instructor within one week of receiving notification of the grade. An appeal for change of final grade must be submitted to the Registrar's Office in writing and providing the basis for appeal within 30 days of receiving notification of the final grade, providing the basis for appeal. A review fee of $50.00 must accompany the appeal. If the appeal is sustained, the fee will be refunded.

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.

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