

**Biochemistry I – CHEM 351**  
**Syllabus – Spring 2021**

**Class Times and Location**

Section 001 Tuesday and Thursday from 2:00 pm to 3:15pm, Smith Hall 556

Section 002 Tuesday and Thursday from 3:30 pm to 4:45pm, Smith Hall 556

**Instructor**

Dr. Stephen Hancock

E-mail: stephenhancock2@towson.edu

Office: SM 553

Phone: x48036

Virtual Student Hours: Monday from 3:00 pm to 4:00 pm

Wednesdays from 4:30 pm to 5:30 pm

Or By appointment

**Textbook**

“Lehninger Principles of Biochemistry” (2017) David L. Nelson and Michael M. Cox. Seventh Edition.

Publisher: W.H. Freeman – Abbreviated “PoB” below.

**Course Objectives and Pre-requisites**

The objective of this course is to provide an overview of (i) the chemistry involving the major biological molecules, (ii) the processes in which these molecules participate and (iii) the coordinated cellular activities in which living organisms obtain chemical energy. At the end of the course, students should have developed sufficient background to study more advanced biochemistry topics if they wish.

Prerequisite: CHEM 330 or CHEM 332

**Student hours**

Student hours are hours during which smaller groups of students are encouraged to spend time with the instructor in order to solidify concepts covered in class. All students are encouraged to participate in student hours independent of how comfortable they are with the content. It is always a good idea to get feedback on your learning; who knows, we might just uncover a misconception or a common interest. Additionally, it is super fun to talk about biochemistry.

**Grading Policies**

The final grades and final letter grades will be determined as follows:

- **Five Module Quizzes (70%):** Students will take all quizzes through blackboard and each quiz will account for 14% of your final grade. There will be both synchronous and asynchronous quizzes. Students will take synchronous quizzes during regularly scheduled lecture time. I will post asynchronous quizzes 24-48 hours before they are due and students will submit these to blackboard. Quizzes will be open book and open notes unless otherwise specified.
- **Two Online Discussions (20%):** Each Discussion assignment is worth 10% of the final grade. Explicit discussion instructions will be communicated through blackboard.
- **One Final Exam (10%):** The Final exam will NOT be cumulative and will be completed synchronously during your regularly scheduled Finals slot. The Final exam will also be open note and open book.

Letter Grades will be assigned according to this scale:	
<b>A:</b> 93 – 100	<b>C+:</b> 77 – 79
<b>A-:</b> 90 – 92	<b>C:</b> 70 – 76
<b>B+:</b> 87 – 89	<b>D+:</b> 67 – 69
<b>B:</b> 83 – 86	<b>D:</b> 60 – 66
<b>B-:</b> 80 – 82	<b>F:</b> 59 or below

### **Chemistry Department Statement on Classroom Diversity and Inclusion**

The students, faculty, and staff at Towson University represent a diverse and vibrant community of learners and scholars. As a community, we value the unique contributions of each individual and promote active participation in all aspects of the learning process by each community member. Your instructor supports Towson University's goal of fostering a diverse and inclusive educational setting. Your instructor strives to create a classroom environment built upon the principles of mutual respect and support. Toward this end, all members participating in this course are expected to demonstrate respect for all other members of the class. If you feel these expectations have not been met, please speak with your instructor or the designated diversity liaison, Dr. Cindy Zeller (czeller@towson.edu). For further information regarding the diversity and inclusion policies of Towson University, please see: <http://www.towson.edu/provost/provost/documents/tuacademicstrategicplan2016.pdf>  
[http://www.towson.edu/fcsm/diversity/diversity\\_action\\_plan.asp](http://www.towson.edu/fcsm/diversity/diversity_action_plan.asp)  
[http://www.towson.edu/chemistry/resources/diversity\\_action\\_plan.asp](http://www.towson.edu/chemistry/resources/diversity_action_plan.asp)

### **Make Up Policies**

- Students who fail to submit a quiz, exam, or literature discussion on time due to a justified event may arrange an extension directly with me. In the case of justified event (with appropriate documentation) students may complete a makeup assignment for full credit. Because assessment will be conducted asynchronously, no unjustified make-ups or extension will be provided. Please be sure to keep track of due dates.
- Students missing a synchronous quiz due to a justified or unjustified absence may arrange a make-up opportunity directly with me. In the case of justified absences (with appropriate documentation) students may take the missing quiz for full credit. In the case of unjustified absences, a late penalty of 5% for the first day and additional 3% for every day late will be applied to the grade of the first make-up quiz. If a student misses a second quiz due to an unjustified absence, a late penalty of 8% for the first day and additional 5% for every day late will be applied. A third quiz missed due to an unjustified absence cannot be made up.
- A missed quiz or assignment should be made up promptly, preferably within a day, but no later than 7 days after the missed due date. After 7 days, make-up assignments will only be allowed for documented circumstances beyond the control of the student. For example, if you were ill for 4 days including the day of the exam, you must make up the exam on the 5th, 6th or 7th day but if you were hospitalized for 10 days, you will be allowed to make up the

exam on the 11th day. Please communicate with me promptly before or after missing an exam so that reasonable arrangements for your specific circumstance can be made.

- Examples of justified absences include prolonged illness, hospitalization, death of a close relative, and police detentions. Examples of unjustified absences include having to study for another exam, “forgetting” about the assignment due date, and undisclosed personal reasons (NOTE: if you are experiencing a personal issue that is preventing you from completing your work that you would prefer not to share, please speak with me and we can make a plan.)

### **Course content and Hybrid course logistics**

*Course content* including lecture videos, readings, practice problems, supplementary academic videos, supplementary readings, etc. will be available to students at the beginning of each week. Content is to be consumed **BEFORE** attending synchronous (real-time) lectures (in-person or online via zoom). I will be asking you to **apply** the content that you learn through asynchronous content to in class activities meant to reinforce these concepts. Please come to class prepared by watching all of the videos and attempting the practice problems before class.

### **Class participation/Engagement/Attendance**

Students are expected to participate in the course through regular attendance at lectures; either in-person, or remotely via zoom. Attendance to lectures will not be used as a grading criterion; however, important problem solving sessions and data discussions will occur during lecture and extra credit assignments may be made available during class sessions. Lecture attendance will facilitate course engagement with the instructor, the material, and your peers. Engagement is an extremely valuable aspect of learning and attendance to lectures will increase your likelihood of doing well on quizzes and assignments. In addition, various forms of assessment and extra credit assignments will be administered during in-class sessions. No make-up opportunities will be available to students who miss extra credit opportunities due to absences – ***Please do not attend in-person sessions if you are not feeling well!***

### **Copyright – Applies to ALL course materials.**

My lectures and course materials, including, but not limited to lecture videos, power point presentations, tests, outlines, discussion prompts and similar materials, are protected by copyright. I am the exclusive owner of copyright of those materials. You may take notes and make copies of course materials for your own use; however, you may not, nor may you allow others to, reproduce or distribute lecture notes and course materials publicly, whether or not a fee is charged, without my express written consent. Similarly, you own copyright in your original papers and exam essays. If I am interested in posting your answers or papers on the course web site, I will ask for your written permission.

### **Academic Integrity Policy**

Students are responsible members of the academic community. You are therefore obligated to uphold the basic standards of integrity. You are also expected to take an active role in encouraging other members of the community to respect those standards. Should you have reason to believe that a violation of academic integrity has occurred, you are encouraged to make the suspicion known to a member of the faculty or University administration.

*Cheating* – Using and/or disseminating unauthorized materials, information, notes, study aids, videos or other resources in any academic exercise is a violation of academic integrity. *This includes unauthorized*

*communication of information during an exercise or exam.* Some examples of cheating include but are not limited to: Copying from another student's work or receiving unauthorized assistance during any graded assignment; procuring tests or examinations before the scheduled exercise without authorization; copying reports, laboratory work, computer programs or files and the like from other students; submitting work that is not your own; using solutions manuals, providing exam and assignment questions to student websites or using such a website to complete an assignment and/or exam (including free or pay websites such as "Chegg Study" and "Course Hero"). To clarify, copying or collaborating with other students or using external resources, including other people, on any type of assignments that are expressly designed to be completed individually is cheating and violates the University's academic integrity policy.

Recorded sessions and any associated course content is designated *ONLY* for registered students in the class. Sharing or dissemination of recordings beyond the student body registered in the course and section constitutes a violation of privacy and/or copyright infringement depending on the circumstance.

*Complicity in Academic Dishonesty*— helping or attempting to help another commit an act of academic dishonesty violates academic integrity policies. Some examples include but are not limited to: Allowing another to copy one's work for an assignment; distributing test questions or substantive information about the material to be tested without authorization before the scheduled exercise; collaborating on academic work that is expressly designed to be completed individually; taking an examination or test for another student; signing a false name on an academic exercise; or sharing assignment or exam information before, during, or after the deliverable in written, electronic, video, or verbal form. (*Note: Collaboration and sharing information are characteristics of academic communities. These become violations when they involve dishonesty. Students should seek clarification when in doubt.*)

Cases of academic dishonesty will be handled in accordance to the student academic integrity policy recommendations. Please visit the following website for more information on these policies:

[https://www.towson.edu/provost/academicresources/documents/03\\_01\\_00\\_student\\_academic\\_integrity\\_policy.pdf](https://www.towson.edu/provost/academicresources/documents/03_01_00_student_academic_integrity_policy.pdf)

In most cases, students who are found cheating will received zero on the quiz or exam in question and a letter describing the incident will be sent to the Office of the Registrar and to the department chairperson. When necessary, violations will be reported to the Office of Judicial Affairs.

### **Discussion Board Conduct**

The discussion board should be viewed as a course forum to discuss the readings, videos, and other course-related content. The tone of all posts should be respectful and professional in nature. There will be two mandatory discussion board assignments. Beyond these assignments, students should feel free to post to The Discussion board regarding other aspects of the course that you find interesting or challenging. When interacting with peers on the discussion board it is required that students conform to the following guidelines.

- Treat the other students and your faculty member the same online as you would in person. Engage with others in a respectful manner.
- Keep in mind that written communication lacks the non-verbal cues we use to understand each other. It may be helpful to review what you write to ensure the message reads the same way you are intending it to.
- Remember the [TU Student Code of Conduct](#) in all online engagement.

- It is not appropriate to post statements of a personal or political nature, or statements criticizing classmates or faculty. Inappropriate statements/language will be deleted by the course faculty.

### **Loaner Laptop Availability and Student Support Funds:**

The Office of Technology Services (OTS) has a limited number of laptops to loan to students whose personal computers are unable to run Blackboard, WebEx, Zoom or applications required by the curriculum. If you need to borrow a device, talk to your instructor; they can submit a request on your behalf.

The Towson University Foundation has created the Student Emergency Fund, which has some funds available to assist students in purchasing hotspots, upgrading home internet, and other necessary technologies. For more information, see their [website](#).

### **Attending synchronous class sessions via zoom.**

If you choose to attend real-time (synchronous) class sessions via zoom, please be aware of the following guidelines.

- Please have your webcam turned on. This will increase engagement and allow me to get to know you even if we cannot meet face to face.
- Please test your technology 10-15 minutes before class sessions begin to ensure you will be able to access the zoom session. In the case that you do experience technical difficulties, please contact OTS student support services: [towson.edu/technology/](http://towson.edu/technology/)
- All zoom sessions will be recorded and posted on our blackboard site. Use of these recorded sessions is intended for those enrolled in your section of CHEM351 only, and should not be otherwise shared or disseminated.
- Please remain at your computer and be ready to participate. We will be breaking into groups to solve problem, discuss data, and evaluate literature during these sessions so it is imperative that you come ready to participate.

### **Other policies**

If you may need an accommodation due to a disability, a health issue or any another special circumstance, please contact me privately to discuss your specific needs. A memo from Accessibility and Disability Services (ADS) authorizing your accommodations may be needed.

**Tentative Summary of Contents** –Please note that this schedule is subject to change at the instructor’s discretion. Any changes to the schedule will be communicated to students no later than on week prior to and scheduled due date.

Week	Date	Lecture Topic	Assigned readings, Exam, Quizzes & Assignments
1	1/26/21	Please review the following sections on your own: 1.2 <i>Chemical Foundations</i> ; 1.3 <i>Physical Foundations</i> Syllabus review 13.1 Bioenergetics and Thermodynamics	PoB pgs. 495-501; 47-58
	1/28/21	2.1 Weak interactions in aqueous systems	PoB pgs. 495-501; 47-58
2	2/2/21	2.2 Ionization of acids, weak acids and weak bases 2.3 Buffering against pH changes <b>Drop/add period ends on Tuesday Feb. 2, 2021.</b>	PoB pgs. 58-68
	2/4/21	<b>Quiz One - Synchronous</b> 3.1 Amino acids	<b>Quiz One - Synchronous</b> PoB pgs. 63-68; 75-85
3	2/9/21	3.2 Peptides and proteins 3.3 Working with proteins	PoB pgs. 85-96
	2/11/21	3.4 The structure of proteins: primary structure 4.1 Overview of protein structure	PoB pgs. 96-118
4	2/16/21	4.2. Protein secondary structure 4.3 Protein tertiary and quaternary structure	PoB pgs. 119-142
	2/18/21	4.2. Protein secondary structure 4.3 Protein tertiary and quaternary structure	PoB pgs. 119-142
5	2/23/21	4.4 Protein denaturation and folding	PoB pgs. 142-160
	2/25/21	<b>Quiz Two – Synchronous</b> 5.1 Reversible binding of a protein to a ligand: Hemoglobin	<b>Quiz Two – Synchronous</b> PoB pgs. 142-160
6	3/2/21	5.1 Hemoglobin	PoB pgs. 160-173
	3/4/21	6.1 Introduction to enzymes 6.4 Examples of enzymatic reactions	PoB pgs. 187-189, 213-218
7	3/9/21	6.2 How enzymes work	PoB pgs. 190-198
	3/11/21	6.2 How enzymes work	PoB pgs. 190-198 <b>Discussion Board assignment #1</b> <b>Due: All posts should be made by</b> <b>Sat. 10/10 at 11:59pm</b>
8	3/16/21	<b>Spring Break: No Class</b>	
	3/18/21	<b>Spring Break: No Class</b>	
9	3/23/21	6.3 Enzyme kinetics	PoB pgs. 198-204
	3/25/21	6.3 Enzyme kinetics	PoB pgs. 205-212 <b>Quiz Three due Friday. 10/17 at</b> <b>11:59 pm – Asynchronous</b>
10	3/30/21	6.3 Enzyme Inhibition	PoB pgs. 205-212

	4/1/21	6.3 Enzyme Inhibition	PoB pgs. 205-212
11	4/6/21	7.1 Carbohydrates: Monosaccharides & disaccharides	PoB pgs. 241-252
	4/8/21	<b>Quiz Four</b> 7.2 Polysaccharides	<b>Quiz Four – synchronous with an asynchronous component</b> PoB pgs. 254-260
12	4/13/21	10.1 Storage lipids 10.2. Structural lipids	PoB pgs. 361-369, 387-393
	4/15/21	11.1 The composition of membranes	PoB pgs. 387-393
13	4/20/21	11.3. Solute transport across membranes 12.1 General features of signal transduction 12.2 G protein coupled receptors & 2 <sup>nd</sup> messengers <b>Last day to withdraw: Monday, Nov 2, 2017</b>	PoB pgs. 405-408, 412-413; 437-450
	4/22/21	13.2. Chemical logic and Common Biochem reactions 13.3 Phosphoryl group transfer and ATP	PoB pgs. 501-509, 511-513
14	4/27/21	13.4. Biological oxidation reduction reactions	PoB pgs. 517-526
	4/29/21	<b>Quiz Five - synchronous</b> 14.1 Glycolysis 14.3. Fates of pyruvate under anaerobic conditions 14.4. Gluconeogenesis	<b>Quiz Five – synchronous</b> PoB pgs. 533-548, 553-565
15	5/4/21	16.2 Reactions of the citric acid cycle	PoB pgs. 624-639
	5/6/21	16.2 Reactions of the citric acid cycle	PoB pgs. 624-639
16	5/11/21	Review	<b>Discussion Board assignment #1</b> <b>Due: All posts should be made by Sat. 12/5 at 11:59pm</b>
<b>Final Exam</b>			
		<a href="#">CHEM 351-001: Tuesday, May. 18, 3-5PM</a> <a href="#">CHEM 351-002: Thursday May. 13, 3-5PM</a>	<b>Final Exam – Synchronous with an asynchronous component due by the start of your final exam time.</b>