

**Course Syllabus**  
**INTRODUCTION TO CELLULAR BIOLOGY AND GENETICS**  
**BIOL 200 Section 003, Spring 2021**

**Instructor**

Dr. Larry Wimmers  
Email; lwimmers@towson.edu  
Office Hours: T, Th, F 12:00 – 1:00 via Zoom

**Meeting Times and Rooms**

T/Th 9:30 – 10:45, Zoom

**Required Texts**

**Text**

The text book required for lecture component of this course is *Biology 2<sup>nd</sup> ed., OPENStax*. Digital versions of this text are free at openstax.org. Donations are accepted. You may purchase a printed copy in the University Store. Please see me if you have a copy of a recent introductory biology text and would like to know if it is acceptable.

**Course Description**

An introduction to biology, including biologically important molecules, cell and tissue structure, respiration, photosynthesis, mitosis, meiosis and genetics.

**Learning Outcomes**

The following outline summarizes the objectives for BIOL.200. It is not meant as a specific study guide and does not include the details you need to know to accomplish the goals. The objectives summarize the "big ideas" that we will be covering in this course.

- I. Understand and apply the scientific method to solving problems
  - A. Recognize that the scientific method is simply a way of approaching a problem that begins with understanding a set of basic information.
  - B. Learn to develop hypotheses and design controlled experiments to test them.
  
- II. Develop a sufficient understanding of chemistry to predict properties of biological molecules.
  - A. Understand the structure of atoms
  - B. Describe how and why atoms form chemical bonds with one another.
  - C. Know the functional groups of organic (and biological) molecules and understand how functional groups determine properties of the molecules of which they are a part.
  - D. Recognize and be able to explain the roles and properties of carbohydrates, lipids, proteins, and nucleic acids.
  - E. Understand the properties of water that make it indispensable to life.

- III. Know the structure of a "typical" plant, animal, and bacterial cell.
- A. Learn the names and functions of each of the structures (organelles) within a cell.
  - B. Describe the way in which organelles work together to accomplish cellular functions.
- IV. Develop a "feel" for the principles of cellular energetics.
- A. Describe the way in which the first and second laws of thermodynamics control chemical reactions, in general, and metabolic reactions, in particular.
  - B. Know the basic properties of enzymes and describe their function and regulation.
  - C. Understand the role of enzymes in the processes of photosynthesis and in cellular energy harvesting pathways.
  - D. Write an overview of the reactions that make up the metabolic pathways studied.
- V. Integrate the processes of sexual reproduction (meiosis and fertilization) with the ability to predict the frequencies of traits in the offspring.
- A. Describe mitosis and meiosis, step by step.
  - B. Explain Mendel's laws of inheritance, gene linkage, and crossing-over.
  - C. Correlate Mendel's laws to the movement of chromosomes during meiosis.
  - D. Use probability to calculate the results of genetic crosses.
- VI. Understand the "Central Dogma of Molecular Biology": DNA → RNA → Protein.
- A. Be able to explain the structure of DNA and RNA and correlate structures to their roles.
  - B. Describe the processes of DNA replication, transcription, and translation.
  - C. Understand the basic characteristics of the genetic code.
  - D. Describe mechanisms of regulation of gene expression in prokaryotes and general principles of gene regulation in eukaryotes.

## **Course Requirements**

### **Lecture Reading Assignments**

There will be a reading assignment for each chapter.

### **Examinations**

There will be three midterm exams and a comprehensive final. Approval to miss an exam will only be given in the case of a documented illness or emergency. Extended illnesses or the death of a close relative or friend should be reported to the Division of Student Affairs. The student must request approval within 24 hours of the scheduled exam. Exams missed due to excused absence will be "made up" by a final exam worth a point value equal to the normal final exam plus the value of the missed midterm. All appeals must be in writing.

### **Classroom Participation**

Classroom participation will be assessed during class by response to questions using the poll function in Zoom. Recorded participation will be awarded up to 2.0 points/class meeting. Students can accumulate a maximum of 40 participation points.

### **Exercises**

Beginning April 5<sup>th</sup> there will be 12 exercises, each worth 5 points. For each you will complete a short

multiple choice quiz. If your grade on that quiz is 80% or above you will receive the full 5 points for the exercise. If your grade is below 80% you will have the opportunity to regain the missing points by completing an ancillary assignment covering the same material. Due dates are listed in the course schedule

### Grading Policy

The final grade will be calculated based on a total of 500 points as follows:

Assignment		Points
Class Participation	2.0 pts/class, 40 pts max.	40 pts
Exercises	5.0 pts/exercise	50 pts
Midterm Exams	Three at 100 pts each	300 pts
Comprehensive Final		100 pts
Total		500 pts

Letter Grade	% Range						
A	92 - 100%	B+	88 – 89.9%	C+	78 – 79.9%	D+	68 – 69.9%
A-	90 - 91.9%	B	82 - 87.9%	C	70 – 77.9%	D	60 - 67.9%
		B-	80 – 81.9%			F	< 60%

### Policies

#### Attendance

Attendance is expected and strongly recommended but *not* required. While the text should explain the important facts and concepts, the lecture will deal with applications of those facts and concepts and higher cognitive order questions.

#### Copyright

All lectures and course materials, including, but not limited to power point presentations, tests, outlines, and similar materials, are protected by copyright. Dr. Larry Wimmers is 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 written consent of Dr. Wimmers.

#### On-Line Participation

The class will consist of synchronous online activities and you are expected to be “virtually” present for synchronous activities just as if you were meeting in a regular classroom. You must have a working computer, microphone, webcam, and internet connection to participate in the synchronous activities. We will adhere to the following policies for the synchronous activities:

- In the event of technical difficulty, email the instructor immediately. Do your best to resolve the issue before class.
- In the event the instructor has technical difficulty and disappears and does not return in 3 minutes, please wait an additional ten minutes before logging off. The instructor will be trying to reestablish the connection and/or may be trying to reach an alternate internet connection. If the instructor does not

return within those 10-15 minutes, see Blackboard for instructions which will be posted as soon as possible.

· In the event of a snowstorm, hurricane, or any widespread loss of power and/or internet connections which disrupts many participants, alternate materials will be posted on Blackboard. Make sure to check as soon as you are able to connect to the internet.

### **Academic Honesty**

The Towson University Code of Conduct prohibits "all forms of dishonesty including cheating (and) plagiarism." The consequences of academic dishonesty will be a failing grade of 0 points for the assignment.

Students are responsible members of the academic community. You are therefore obligated not to violate 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 means misusing, attempting to misuse, and/or disseminating unauthorized materials, information, notes, study aids, videos or other devices in any academic exercise. This includes unauthorized communication of information during an exercise or exam. Some examples include but are not limited to: Copying from another student's paper or receiving unauthorized assistance during any graded deliverable; using books, notes or other devices (e.g., calculators, phones, watches, laptops, or other internet enabled devices) when these are not authorized; procuring without authorization tests or examinations before the scheduled exercise (including discussion of the substance of examinations and tests when it is expected these will not be discussed); copying reports, laboratory work, computer programs or files and the like from other students; collaborating on laboratory or computer work without authorization; having a substitute take an examination, 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 that maintain textbook and/or instructor solutions). 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.

Recorded sessions and any associated materials are designated ONLY for registered students in the class. Any sharing or dissemination of recordings beyond the student body registered in the course and section constitutes a violation of privacy and may also be categorized as cheating or defamation of character (depending on the circumstance), a possible copyright infringement.

Complicity in Academic Dishonesty means helping or attempting to help another commit an act of academic dishonesty. Some examples include but are not limited to: Allowing another to copy from one's paper during an examination or test; 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).

Abuse of Academic Materials means destroying, stealing, or making inaccessible library or other resource materials. Some examples include: Stealing or destroying library or reference materials needed for common academic exercises; hiding resource materials so others may not use them; destroying computer programs or files needed in academic work; stealing or intentionally destroying another student's notes or laboratory experiments; receiving assistance in locating or using sources of information in an assignment where such assistance has been forbidden by the instructor.

### **Student Conduct**

To make our time together more valuable, we are going to establish a basic philosophy:

**"Every student has the *right* to learn, as well as the *responsibility* not to deprive others of their right to learn."** To ensure that we observe this philosophy, I will ask you to respect the following policies. The discussion board should be viewed as a course forum to discuss the readings, videos, and other course-related content. Your participation in the discussions counts as attendance in this asynchronous online course. The tone of all posts should be respectful and professional in nature.

- 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

### **Americans with Disabilities Act**

If you are a qualified student with a disability seeking accommodations under the Americans with Disabilities Act, you are required to self identify with Accessibility Disability Services (ADS) in the Administration Building. Accommodations cannot be provided without a letter from ADS. This should be done during the first week of class.

### **Diversity Statement.**

Towson University values diversity and fosters a climate that is grounded in respect and inclusion, enriches the educational experience of students, supports positive classroom and workplace environments, promotes excellence, and cultivates the intellectual and personal growth of the entire university community. Should you feel that you are experiencing a negative environment related to diversity issues or cultural sensitivity, we encourage you to contact the Department's Diversity Committee Chair, [Dr. Colleen Winters [cwinters@towson.edu](mailto:cwinters@towson.edu) ]. For more information go to <http://www.towson.edu/fcsm/diversity/>

### **Late Assignments**

All assignments are due at the day and time listed. Late assignments will not be accepted.

## Calendar

<b>Week Beginning:</b>	<b>Lecture Subject</b>	<b>Exercise Due Dates (EOD = End of Day)</b>
1/25	The Science of Biology (Chp 1) The Nature of Molecules and the Properties of Water (Chp 2)	
2/1	The Nature of Molecules and the Properties of Water (Chp 2) Carbohydrates (Chp 3)	
2/8	Proteins (Chp 3) Energy and Metabolism (Chp 6)	
2/15	Lipids (Chp 3) Membranes (Chp 5)	
2/22	<b>2/23 Test 1 (Chps 1, 2, 6 + Carbohydrates and Proteins in Chp 3)</b> Cell Structure and Function (Chp 4)	
3/1	How Cells Harvest Energy (Chp 7)	
3/8	Photosynthesis (Chp 8)	
3/15	Spring Break	
3/22	Nucleic Acids in Chp 3 DNA The Genetic Material (Chp 14)	
3/29	<b>3/30 Test 2 (Chps 4, 5, 7, 8 + Lipids in Chp 3)</b> How Cells Divide (Chp 10)	
4/5	How Genes Work (Chp 15)	Ex 1: Tuesday, 4/5 9AM Ex 2: Friday 4/8, EOD Ex 3: Friday 4/8, EOD
4/12	Control of Gene Expression (Chp16)	Ex 4: Tuesday, 4/12 9AM Ex 5 Tuesday, 4/12 EOD
4/19	Sexual Reproduction and Meiosis (Chp 11)	Ex 6: Tuesday, 4/19 9AM Ex 7: Tuesday, 4/19 EOD
4/26	<b>4/27 Test 3 (Chps 10, 14, 15, 16 + Nucleic Acids in Chp 3)</b> Patterns of Inheritance (Chp 12)	Ex 8: Tuesday, 4/26 9AM Ex 9: Thursday, 4/28 EOD
5/3	Patterns of Inheritance (Chp 12) Inheritance Connection (Chp 13)	Ex 10: Thursday, 5/5 9AM Ex 11: Thursday, 5.5 EOD
5/10	Review	Ex 12: Tuesday, 5/10 EOD
5/18	<b>Final Exam: May 18<sup>th</sup>, 8:00 – 10:00 a.m.</b>	