

## Biology 314-Cell Biology

UW-Stevens Point

Fall 2018

**Instructor:** Dr. Ashley Driver

**Office:** CBB 307

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**Phone:** (715)-346-4256

**Lecture** (CBB 165): M W 9:30-10:45am

**Lab** (CBB 323): *Section 1* T 9:00-11:50am, *Section 2* T 2:00-4:50pm

**Office Hours:** Wednesday from 11am-12:00pm, Thursday 11:00am-12:00pm or by appointment.

**Course description:** Cells are the building blocks to life. During this course we will discuss the key features of cellular structure, function, and application to the field of biology. My goal as your instructor will be to provide you with the information necessary to create thoughtful and creative conclusions regarding these topics. Additionally, I will challenge you to use the scientific method to investigate various cell types and components in the laboratory environment. You are expected to attend and participate in classroom and laboratory activities and show respect to your colleagues and I during the semester. I look forward to our journey through cell biology and hope that you will find this class both rewarding and fun!

### By the end of the course a student should be able to:

- 1.) Identify biomolecules necessary for cellular function.
- 2.) Describe the structure and function of organelles in prokaryotic and eukaryotic cells.
- 3.) Understand the requirements needed for cells to create energy.
- 4.) Describe the processes involved in cellular transcription and signaling.
- 5.) Identify the main components required for cell shape, structure, and adhesion.
- 6.) Outline the process of growth, division, and death and how these are regulated.
- 7.) Give examples of how cells maintain their identity and how this impacts tissue formation.
- 8.) Understand how the application of cell biology impacts society through research and medicine.

**Textbook:** *Molecular Biology of the Cell, 6<sup>th</sup> edition* (MBoC 6e) by Alberts, Johnson, Lewis, Morgan, Raff, Roberts, and Walter (2015, Garland Science, New York/Oxford). The book should be available through the UWSP bookstore rental program at the Dreyfus University Center. Copies may also be available through Amazon rental. I do NOT advise using an older edition as there have been significant changes made to this book (due to growing knowledge in cell biology!!).

**Lab Manual:** "Experimental Cell Biology" available at the bookstore.

### Point Distribution:

<b>Exams</b> (100 pts each x 4 exams)	400 points
<b>Lecture Quizzes</b> (11 quizzes, 1 drop)	50 points
<b>Pre-Lab Preparation</b> (12 labs)	30 points
<b>Lab Reports</b> (8 reports due)	120 points
<b>Pre-Lab/Post-Lab Quizzes</b> (11 quizzes, 1 drop)	<u>50 points</u>
	<b>650 points</b>

**Exams:** You will have four total exams in this course, each totaling 100 points. Exams are closed-notes, closed-book. These exams will be given in class on selected dates shown in the schedule. **Attendance is mandatory for exam sessions.**

**Lecture Quizzes:** Eleven 5-point quizzes covering lecture material will be posted on D2L on Thursday evenings. You will have until the **following Sunday evening (at midnight CST)** to have these quizzes submitted with up to 3 total attempts to get full points. **You are expected to complete the quizzes independently. Sharing your quiz answers with other students or receiving quiz answers from other students constitutes academic dishonesty.** Due to these being available online for multiple days, **there will be no make-up quizzes**. Out of the 11 total quizzes, the lowest score will be dropped

**Quiz keys:** After the closing date/time for each quiz, the key will be posted on D2L.

**Pre-Lab Preparation:** **You are expected to maintain a lab notebook.** This can be in the form of a spiral/bound notebook or binder with attached loose-leaf paper. Each lab has a “**pre-lab checklist**” where specific tasks are listed (e.g.- creating a hypothesis or drawing diagrams). At the beginning of each lab session I will be checking your notebooks to assess whether this has been completed. Failure to complete these tasks or evidence of incomplete answers will result in a loss of points!

**Lab Reports:** Lab reports will be due during the semester with varying point totals. You will be expected to write thorough and clear findings. Additionally, when applicable, you will be asked to interpret your data (i.e.- what do these results tell you? Why is this important?). *You are allowed one late lab report (up to 7 days after lab) with a 50% point reduction. After this, any late lab reports will get a 0.*

A well-maintained lab notebook is useful in completing the required lab report forms that will be evaluated by the instructor. A lab notebook is also a useful resource in preparing for lab quizzes and exams. While many exam questions address materials covered in lecture, questions about experiments performed in the lab *are included on each of the four exams*. This includes the experiments for which students complete lab report forms for evaluation, as well as other experiments that do not require the completion of lab report forms.

Lab report forms are required for each of the following experiments. The point value of each form is indicated.

- *Experiment 2* (10 points)
- *Experiment 3* (15 points)
- *Experiment 4* (10 points)
- *Experiment 5* (15 points)
- *Experiment 6* (10 points): In-class lab report form
- *Experiment 7* (10 points): In-class lab report form
- *Experiment 8* (5 points)
- *Experiment 9* (5 points)
- *Experiment 10* (10 points): In-class lab report form
- *Experiment 11* (10 points)
- *Experiment 12* (10 points)
- *Experiment 13* (10 points): In-class lab report form

Note that the lab report forms for Experiments 6, 7, 10 and 13 are completed and submitted in-class, during the scheduled lab periods. Failure to attend lab on the scheduled dates for any one or more of these experiments will in a zero for that in-class lab report.

**Pre-Lab/Post-Lab Quizzes:** A total of eleven 5-point quizzes will be given during the laboratory session, with the lowest score dropped. **Lab quizzes cannot be made up without advance and approved notice of absence (see Absences).**

## Grading Scale:

91.0-100	A	81.0-88.9	B	71.0-78.9	C	60.0-68.9	D
90.0-90.9	A-	80.0-80.9	B-	70.0-70.9	C-	00.0-59.9	F
89.0-89.9	B+	79.0-79.9	C+	69.0-69.9	D+		

**Course grading:** Your grade in this course will be determined by dividing the total number of points that you earn by the total (600), then multiplying by 100, and rounding to the nearest 0.1%.

**Extra Credit:** Extra credit assignments will not be given in this course. There is a *possibility* that bonus points may be given in the class—so plan to regularly attend! If you aren't here, you can't get the extra points!

**Absences:** It is expected that you will regularly attend both lecture and laboratory sessions for this course. Success cannot be attained if you are not actively participating with your colleagues to understand the material.

- **If you are ill on the day of an exam or an in-class activity, you must contact me before class (if at all possible) and you should be prepared to provide documentation.** I must be notified of other conflicts, such as those arising from University sponsored athletic teams and student organizations, **at least two weeks prior to the event.**
- If you are a student athlete or student organization member whose team/organization will be traveling to away games/events on *any of the dates* on which in class activities or exams are scheduled, it is imperative that you provide me with your travel letter **as soon as you receive it** from your coach/advisor so we can schedule your makeup activities/exams.

**Electronic Devices:** Laptops will be allowed in lecture with the premise that they are used for the sole purpose of accessing course material during class time. It is expected that you stay on task and do not cause distraction during the class period. Moreover, it is expected that you will silence your cell phone during class and refrain from using text messaging/surfing the web/etc. during the class period. Please be respectful!

## Academic Policies:

Academic misconduct (as outlined and defined by Chapter 14 in the Academic Handbook.<https://www.uwsp.edu/acadaff/Pages/handbook.aspx>) will NOT be tolerated in this course. As a student you are expected to show integrity and honesty! Cheating or plagiarism related to any of the course assessments *will not be tolerated* and result in a score of zero for that assessment.

## Disability Services:

Any student who feels that he/she may need an accommodation based on the impact of a disability should contact the Disability and Assistive Technology Center (Room 609 Albertson Hall, [datctr@uwsp.edu](mailto:datctr@uwsp.edu)). If you have already registered with this office and would like to discuss your class accommodations for the semester, please set up an appointment to meet with me privately.

## Grade Discrepancies:

Grades will be posted on D2L throughout the semester. If there are discrepancies on any assignments, quizzes, or exams they can be addressed with the instructor, in person, up to *one week* after the grade is posted (for online quizzes) or the assignment/exam/quiz is handed back in class. After this time, the grade will stand with whatever was originally granted.

**Emergencies:**

In the event of a medical emergency call 9-1-1 or use Red Emergency Phone in the hallway outside of the classroom. Offer assistance if trained and willing to do so. Guide emergency responders to victim.

In the event of a tornado warning, proceed to the first floor of the CBB Building where there is designated shelter rooms. In the event of a fire alarm, evacuate the building in a calm manner. Meet outside the building and notify instructor or emergency command personnel of any missing individuals.

Active Shooter/Code React – Run/Escape, Hide, Fight. If trapped hide, lock doors, turn off lights, spread out and remain quiet. Call 9-1-1 when it is safe to do so. Follow instructions of emergency responders.

See UW-Stevens Point Emergency Procedures at [www.uwsp.edu/rmgt/Pages/em/procedures](http://www.uwsp.edu/rmgt/Pages/em/procedures) for details on all emergency response at UW-Stevens Point.

<b>Date</b>	<b>Lecture Topic</b>	<b>Book Chapters</b>	<b>Lab topic (Lab Manual #)</b>
9/5	What is a cell? How do we visualize it?	Chapter 9	Administrative topics/lab safety
9/10	The plasma membrane: structure and lipid properties	Chapter 10	Visualizing cells ( <i>Experiment 1</i> )
9/12	The plasma membrane: proteins	Chapter 3,10	
9/17	Membrane transport: principles and transporters	Chapter 11	Membrane Isolation from red blood cells ( <i>Experiment 2</i> )
9/19	Membrane transport: channels and electrical properties	Chapter 11	
9/24	Intracellular compartments and nuclear transport	Chapter 12	Membrane protein isolation and detection ( <i>Experiment 3</i> )
9/26	<b>Exam 1</b>		
10/1	Protein transport into mitochondria, chloroplasts, and the ER	Chapter 12	Protein sorting and vesicular trafficking ( <i>Experiment 4</i> )
10/3	Membrane transport: Endocytosis and exocytosis	Chapter 13	
10/8	Energy conversion in the cell: The mitochondrion	Chapter 14	Electron transport in mitochondria ( <i>Experiment 5</i> )
10/10	Energy conversion in the cell: Chloroplasts and photosynthesis	Chapter 14	
10/15	The cytoskeleton: function, actin and myosin	Chapter 16	Myofibril structure and contraction ( <i>Experiment 6</i> )
10/17	The cytoskeleton: microtubules and intermediate filaments	Chapter 16	
10/22	<b>Exam 2</b>		Motility of demembrated flagella ( <i>Experiment 7</i> )
10/24	Gene expression: Transcriptional controls and regulators	Chapter 7	
10/29	Gene expression: Cellular memory and post-transcriptional control	Chapter 7	A study of ameoid movement ( <i>Experiment 8</i> )
11/31	Cell signaling I: Principles and G-protein coupled receptors	Chapter 15	
11/5	Cell signaling II: Enzyme coupled receptors and gene regulation	Chapter 15	Cell Signaling in slime mold ( <i>Experiment 9</i> )
11/7	Cell Cycle: Mitosis	Chapter 17	
11/12	Cell Cycle: Meiosis	Chapter 17	Cell signaling in rat adrenal glands ( <i>Experiment 10</i> )
11/14	Cell Death	Chapter 18	
11/19	<b>Exam 3</b>		DNA fragmentation and cell apoptosis ( <i>Experiment 11</i> )
11/21	Cell Junctions: Cell-to-cell and Cell-to-matrix	Chapter 19	
11/26	Cell Junctions: Cell-to-matrix	Chapter 19	Adherent cell cultures and integrins ( <i>Experiment 12</i> )
11/28	Cancer Cell Biology	Chapter 20	
12/3	Developmental Biology: Morphogenesis	Chapter 21	Cancer cell characteristics ( <i>Experiment 13</i> )
12/5	Developmental Biology: Neurogenesis	Chapter 21	
12/10	Tissue regeneration/Stem cell biology	Chapter 22	Cancer cell characteristics ( <i>Experiment 13</i> )
12/12	Tissue regeneration/Stem cell biology	Chapter 22	
<b>FINAL EXAM- 12/20/18 10:15am-12:15PM CBB 165</b>			