

## **Biol 212: Cell Biology—Course Syllabus**

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### **Course Information**

**Course:** Biol 212 Cell Biology

**Number of Credits:** 5

**Delivery Mode:** Face to face

**Location:** Class in Science 351, Lab in Science 345

**Course Schedule:** TTH 9:30-10:45, Lab T 12:30-4:40

### **Faculty**

Dr. Margaret Goodman

Science 369

[mgoodman@wittenberg.edu](mailto:mgoodman@wittenberg.edu)

Drop-in office times: 1:00-2:30 p.m. Monday and Thursday 1:30-3:00. We can also schedule appointment times. There is a link on the Moodle page to sign up or you can contact me by email or in person! I look forward to your visits, comments and questions.

### **Course Description**

Cell biology focuses on the structure and function of the cell, examining individual structures and building toward a synthesis of the dynamic metabolic processes of the cell. These processes include synthesis of cellular components, metabolic pathways, and signaling pathways. This course counts as Group 1 requirement for the biology major and is a core requirement for the BMB major. Prerequisites: Biol 170

### **Course Outcomes**

- Summarize basic cellular processes for manufacturing and maintaining cellular components (energy and material transfer) in discussion and on exams;
- Describe processes of cell communication (information transfer) in discussion and on exams;
- Integrate cellular processes for energy, material and information transfer in a cumulative essay as part of the final exam.
- Demonstrate facility in implementing laboratory techniques, collection and interpretation of data and recording and tracking experimental steps and goals in a laboratory notebook.
- Demonstrate understanding of the scientific process in cell biology through summaries of primary research articles and authoring a methods and results reports and a primary research report
- Incorporate relevant primary research to inform understanding of cellular concepts, development of laboratory experiments and interpretation of data as demonstrated through research summaries and the primary research report.

### **Program Outcomes Integration**

This course supports students' achievement of the following program outcomes:

Biology Learning Outcomes 1 and 3, BMB Learning Outcomes 1 and 3:

- Summarize basic cellular processes for manufacturing and maintaining cellular components (energy and material transfer) in discussion and on exams;
- Describe processes of cell communication (information transfer) in discussion and on exams;
- Integrate cellular processes for energy, material and information transfer in a cumulative essay as part of the final exam.

Biology Learning Outcomes 3 and 4, BMB Learning Outcomes 2, 3 and 4:

- Demonstrate understanding of the scientific process in cell biology through summaries of primary research articles, developing a project proposal, and authoring a primary research report
- Demonstrate facility in implementing laboratory techniques, collection and interpretation of data and recording and tracking experimental steps and goals in a laboratory notebook.



### **Biology Major Learning Outcomes**

1. Apply knowledge of key biological concepts and underlying fundamentals across all levels of organization
2. Effectively use the scientific method to propose, test, and evaluate a hypothesis to answer a biological question
3. Communicate biological concepts in both written and oral form
4. Effectively find, analyze, and properly use the primary scientific literature to research a biological question

### **BMB Major Learning Outcomes**

1. Explain the biochemical processes of living systems using theories and models at the chemical and molecular level.
2. Effectively use modern laboratory techniques and interpret the resulting data to explain biochemical and molecular process.
3. Demonstrate effective scientific communication skills in both written and oral form
4. Effectively investigate biochemical and molecular topics using the primary scientific literature to contextualize and formulate a research question.

### **Suggested Textbooks and Materials**

Molecular Biology of the Cell, 6<sup>th</sup> ed. by Alberts, et al.

Additional readings will be provided via Moodle.

### **Additional Meeting Times and Instruction Outside of Class**

The classroom and laboratory components provide different approaches to learning about cell structures and processes. In both contexts, there will be additional instructional materials that you will be responsible for completing outside of class. These include instructional videos, directed readings, and outside of class consultations with the instructor. These are noted in the weekly schedule. Additional materials may be added with appropriate advanced notice.

### **Statement on the Expectation of Work**

For each credit hour of classroom or direct faculty instruction, students are expected to engage in two hours of out of class course related work each week during the semester. A four-credit hour course requires eight hours per week of out-of-class work. In addition, there are specific instructional assignments that are to be completed outside of the normal class meeting times. These will be posted on Moodle and include instructional videos, guided readings. It is your responsibility to make sure these activities are completed prior to class or lab. There will also be two required conferences to be scheduled with the instructor: one will be to discuss your understanding of cells at the beginning of the semester and one will be to discuss your CURE proposal.

	Projected Class Schedule	Lab (Tuesday afternoon)
14-Jan	Cells (Ch. 1)	Exploring cells through microscopy
16-Jan	Chem basics (2)	
21-Jan	Chem basics (2)	Isolating the nucleus (methods report for this lab)
23-Jan	Chem basic; glycolysis (2)	
28-Jan	Protein structure and function (3)	Peer review methods report; Journal article #1
30-Jan	Review/catch up	Journal article: Essential Genes of a Minimal Bacterium
4-Feb	<b>Test #1</b>	Serial dilutions and pipettor accuracy; Cell cycle review
6-Feb	Visualizing cells (9)	
11-Feb	Visualizing cells (9)	CURE Yeast lab-week 1 (Methods report for this lab.)
13-Feb	Membranes (Ch. 10)	
18-Feb	Membranes (Ch. 10)	CURE Yeast lab-week 2: Data analysis, finding sources, info on presentations and lab reports
20-Feb	Membranes (Ch. 10)	
25-Feb	Membranes (Ch. 10)	CURE Yeast lab-week 3: Developing proposals
27-Feb	<b>Test #2</b>	
4-Mar	<b>Fire week</b>	FIRE week
10-Mar	<b>Spring break</b>	Spring break
18-Mar	Membrane transport (Ch. 11)	CURE Yeast lab-week 4 (results and discussion report)
20-Mar	Membrane transport (Ch. 11)	
25-Mar	Intracellular compartments (Ch. 12)	CURE Yeast lab-data analysis; presentation prep
27-Mar	Intracellular compartments (Ch. 12)	
1-Apr	Intracellular compartments (Ch. 12)	<b>CURE Yeast lab--presentations (results and discussion report due.)</b>
3-Apr	Vesicular Traffic (Ch. 13)	
8-Apr	Vesicular Traffic (Ch. 13)	Cell surface receptor
10-Apr	Vesicular Traffic (Ch. 13)	
15-Apr	<b>Test #3</b>	Peer review full lab report for yeast lab.
17-Apr	Communication (Ch. 15)	
22-Apr	Communication (Ch. 15)	Tubulin cytoskeleton staining
24-Apr	Communication (Ch. 15)	
29-Apr	Cell cycle and Cancer (Ch. 20) or Cytoskeleton (Ch. 14)	Clean up and wrap up; <b>Full lab report due.</b>
1-May	Review/catch up	
<b>Final</b>	<b>Tuesday, May 7, 8-11 a.m.</b>	

NB: This class schedule is ambitious. I reserve the right to adjust the schedule to accommodate the best learning pace of the class. You will have advance notice of any changes in the schedule. **Test dates will not change.**

## Course Assessments

Notebooks	25	<b>Grade</b>	<b>Minimum points</b>	<b>Percentage</b>
Methods reports (2)	50	A+	824.5	$\geq 97\%$
Results report	25	A+	790.5	93-96.9%
Peer reviews (2)	30	A-	765	90-92.9%
Journal summaries (3)	90	B+	739.5	87-89.9%
CURE proposal	30	B	705.5	83-86.9%
CURE yeast report	100	B-	680	80-82.9%
Quizzes	100	C+	654.5	77-79.9%
Tests (3)	300	C	620.5	73-76.9%
Final	100	C-	595	70-72.9%
<b>Total</b>	<b>850</b>	D+	569.5	67%-69.9%
		D	535.5	63-66.9%
		D-	510	60-62.9%
		F	<509.9	<60%

## Assignments

### Journal summaries

During the course of the semester we will read 3 journal articles. You will turn in a summation worksheet for each of these. The summations will take different forms; these may include a written summary, a concept map, a series of questions to answer, and/or outlining the key information in the article. The format of the summation will be provided with the article when it is distributed. The first article will be distributed the first day of class and we will discuss it in lab.

### Quizzes

Quizzes for the chapters will be available on Moodle. These will be in adaptive mode. They are intended to give you a chance to evaluate your understanding and to practice answering questions similar to those that will be on the tests. The lowest 2 quiz grades will be dropped; there will be no make-up quizzes.

### Tests

Tests will be a combination of objective (~60%) and essay (~40%). Information will be primarily from lecture material, but may also include material from relevant chapters in the text, from primary literature articles, and from exercises completed in lab. Test dates: **February 4, February 27, and April 15.**

### Final Exam

The final exam will cover both the material covered since the last exam (~50%) and cumulative material (~50%). The exam period for this class is **Tuesday, May 13, 12-3 p.m.**

## Laboratory Notebooks

You will be expected to keep a notebook recording all laboratory experiments. This notebook should be bound and kept in permanent ink. Leave the first two pages blank for a table of contents. All entries should contain the following sections:

- date,
- title of experiment (even if it is continued!),
- purpose
- experimental protocols,
- data and data analysis and
- brief conclusion/summary.

In addition, any questions in the lab handout should be answered in your notebook. Each section should be clearly labeled. If you make an error, draw a single line through the mistake and continue. Do not erase, use white out, black out, or any other correction that obliterates what was originally written. Lab notebooks will be graded twice, once before spring break and once at the end of the semester. You do not need to keep the article summaries or peer reviews in your lab notebook.

## Lab Reports and Project Proposal

You will prepare 2 methods reports, 1 results & discussion report, one project proposal one full lab report. The methods and results & discussion will be a minimum of 3 typed pages (12-point font). The project proposal will be a minimum of 4 typed pages (12-point font) and have a Literature Cited section. The full lab reports will contain the following sections: Title, Abstract, Materials and Methods, Results, Discussion and Literature Cited. We will use the citations provided on Moodle. If you use Endnote or other citation programs, you should use **CSE-NY 8th ed**. They will be a minimum of 6 typed pages (12-point font) and are to include the necessary figures and tables to properly present the experiment. We will discuss the methods and results reports and the lab reports at greater length during lab. You may discuss these with your lab partner(s), but each person must write an independent report. Do your own work! **Note that this includes references for any images included in the reports as well as information in the text.**

## Guidelines for Success

### Ethics and Integrity

**Academic Integrity:** Wittenberg has an honor code. You will be held to that honor code and should understand that any substantiated violation may result in failure of the assignment and/or the course and will be filed with the Honor Council. The Wittenberg Honor code may be found on the web page: (<http://www4.wittenberg.edu/academics/academicintegrity/honorcode.html>) Note that adherence to this policy requires a specific reference for all figures, images, and numerical data used. You must also provide appropriate attribution for ideas and experiments. This is critical in scientific writing not only to avoid plagiarism, but to provide a lineage of ideas and a resource for the reader. This is essential for evaluation of ideas and the process of scientific research.

**All work submitted should bear this statement:** “I affirm that my work upholds the highest standards of honesty and academic integrity at Wittenberg, and that I have neither given nor received any unauthorized assistance.”

**In particular, the use of AI is not permitted in this class. If you would like to discuss this policy, please contact me.**

Your student handbook identifies academic dishonesty and we encourage you to examine this description. If you have any questions about what constitutes plagiarism it is your responsibility to



ask—before the assignment is due. The intent of the Wittenberg honor policy is to establish a community of trust, integrity and excellence.

### **Moodle**

There is a Moodle page for this course. Generally, all assignments are to be submitted electronically to Moodle before the due date/time noted in Moodle. In addition, you will find other class resources on the course Moodle page. If you find errors or inconsistencies on the Moodle page, please contact your instructor ASAP.

### **Participation**

Your participation in class is a vital component to learning. Both physical and mental presence in class and participation in classroom and laboratory activities facilitate learning. However, if you are feeling unwell, particularly if you have a fever or are experiencing symptoms of Covid19, please stay home and contact your instructor. If you have other university obligations that require your absence from class, such as a university athletic event, please contact your instructor in advance. If you have an emergency, please contact your instructor as soon as possible. If you have concerns about the safety of the classroom, please let us know. It is important for us to all be respectful of each person and of the university policies for the safety of our community.

### **Communication (E-mail & Course Messages)**

I generally expect that you will check your Wittenberg email at least once per 24-hour period. Any communication and announcements made outside of class and lab time will be via email, so please check your Wittenberg email. You will be responsible for any and all communications via email. Likewise, you can expect that I will check our email, and respond, at least once every 24-hour period (the only exception may be over holiday breaks).

### **Accessibility and ADA Accommodation**

Your learning in this course is important to me. It is my goal that all material presented in this class will be accessible to all students. However, there are many different approaches to learning and we all come with different experiences and prior learning. Please let me know if you have questions about concepts or assignments; I look forward to discussing these topics with you throughout the semester. I invite you to talk with me about ways to ensure your full participation in and access to this course. Please be aware that Wittenberg is committed to providing reasonable accommodations for students with documented disabilities. If you are eligible for course accommodations because of a disability, you need to register with the Accessibility Services Office, located in the COMPASS: Sweet Success Center in Thomas Library. After you register, give me your accommodation letter from Academic Services and arrange to talk with me about your learning needs privately in a timely manner. Early identification at the start of the term is essential to ensure timely provision of services as accommodations are not retroactive. If you have questions or would like more information about services for students with disabilities, please contact the Accessibility Services office at [accessibilityservices@wittenberg.edu](mailto:accessibilityservices@wittenberg.edu).

If you are having a difficult term for personal reasons and it's affecting your academic work (specifically in this course), I invite you to let me know about it so that we can explore your academic options. I also encourage you to use the Campus Ministry or the Counseling Services offered through the Health Center. If you have any questions about the material we are covering in class, please feel free to come talk to me.

### **Diversity**

Every person is entitled to a safe living and learning environment. Building this community and the pursuit of learning both require respectful communication and collaboration. Please be respectful of each other and



the variety of perspectives, backgrounds and experiences each person brings. These enrich our community. Discrimination on the basis of age, class, ethnicity, race, gender, gender identity, sexual orientation, religion or marital status do not have a place in this community.

### **Time Commitment**

For each credit hour of classroom or direct faculty instruction, students are expected to engage in two hours of out of class course related work each week for approximately fifteen weeks. A four- credit hour course requires eight hours per week of out of class work. The laboratory session is a four-hour weekly commitment that is awarded 1 credit hour. Note that laboratory experiences may have commitments outside of the officially scheduled lab time due to the nature of the experiments.

### **Course Policies**

#### **GROUND RULES AND EXPECTATIONS**

- Come to class prepared, expecting to take notes and having read the appropriate material in your textbook or articles provided.
- Unless explicitly state otherwise, you will do your own work and will not offer inappropriate assistance to your classmates. You are encouraged to discuss class material, labs, and other exercises and to study together, but you should write your own lab reports, lab notebook, and complete all tests independently. All material used in writing lab reports and papers should be cited appropriately. If you have questions about what is appropriate in paraphrasing, citation, etc., please ask me. Cheating or plagiarism is sufficient cause for a “0” on the assignment and/or failure of the course.
- Papers, lab reports, and lab notebooks will be due at the **beginning** of the indicated class or lab period. Late papers will have 5 points deducted from the final grade for each day they are late, beginning immediately after the beginning of the class or lab period in which they are due. In general, assignments will be submitted on Moodle.
- Keep an extra paper copy and/or computer copy of any material turned in for class. Just in case.
- If for any **substantive** reason you must miss a test/lab, etc., it is your responsibility to communicate with me **in advance** to make arrangements to reschedule the assignment. (Note: This implies that you have not only left a message but have received acknowledgment from me.)

#### **Additional campus resources**

**Writing Center:** The Wittenberg Writing Center is a space in which you can talk with other students about your writing—such conversations are what professional writers have all the time. The Writing Center is on the first floor of the Thomas Library (just down the steps past the skeleton). You can often stop in and have a walk-in appointment, or you can access the online calendar and set up a time: <https://wittenberg.mywconline.com>. They offer face-to-face, virtual, and email sessions. [Writing Center | Wittenberg University](#).

**Oral Communication Center- OCC** --The OCC is a place where you can go to receive one-to-one assistance with any stage of preparation (from brainstorming, to organizing your ideas, to polishing your delivery) for any kind of speaking assignment (from presentations to debates to leading a class session) or any speaking-related skill (from speech anxiety to effective listening to developing a PowerPoint presentation). It is best to schedule an appointment at the OCC. Follow this link: <https://www.wittenberg.edu/administration/occ/oral-communication-center>

#### **Syllabus Change Statement**

I reserve the right to adjust this syllabus and content to meet the needs of students and to address course outcomes. In the event of substantive changes, students will be notified via an announcement in class, email,



or in Moodle. I ask for your patience this semester as we adapt to any unforeseen circumstances. We will adapt as necessary and I will communicate with you about any changes.