

BIO 2550 – Fundamentals of Cell Biology for Neuroscience  
Winter 2021, 4 Credits

**Instructor** Dr. Karen Myhr  
**Contact** kmyhr@wayne.edu (preferred over phone), 313-577-1504 (goes to email via voicemail), office is technically in 2113 Biological Sciences Building  
**Office Hours** Dr. Myhr's office hours (drop-in hours) will be Tuesdays in Zoom, usually from 4 to 5:15 pm if we do not have another activity or exam, or by appointment.  
**Class Times** 10 to 11:15 1m on Mondays and Wednesdays in Zoom (You should be available both days. We will meet for synchronous activities or exams each Monday. We also will meet synchronously on Wednesday, January 13, to start the semester Warrior strong; and January 21, 2021, instead of the MLK holiday, which is Monday, January 19.)

**Discussion Sections**

Sect.	Day	Time	Teaching Assistant (TA)	Learning Assistant (LA)
002	M	11:30-12:20	Katie Dwyer (fa3735@wayne.edu)	Zahraa Gohsn (gx4516@wayne.edu)
003	T	10:30-11:20	Katie Dwyer (fa3735@wayne.edu)	Vivian Troung (gv9684@wayne.edu)
004	W	11:30-12:20	Lisa Koshko (eq1512@wayne.edu)	Zahraa Ghosn (gx4516@wayne.edu)
005	W	12:30-1:20	Lisa Koshko (eq1512@wayne.edu)	Vivian Truong (gv9684@wayne.edu)

**Learning Assistants** You will have a Teaching Assistant (TA) who will run your Discussion session with the help of your Learning Assistant (LA). TAs are graduate students and LAs are undergraduate students who have succeeded in the course. TAs and LAs are trained to help you succeed, and will work with me to make sure the course runs smoothly.

**Required Materials**

1. Access to *Essential Cell Biology* by Alberts et al., Fifth Edition. (ISBN-13: 978-0393680362). See Canvas about FirstDay Inclusive Access.
2. **Access to Canvas through the internet.** If you do not have a computer or access to the internet, please do not let this stop you from registering for the course. Email me at kmyhr@wayne.edu so I can help you get what you need.
3. Access to the MS Teams app, Word, Excel, and Powerpoint on the computer you will use for class sessions. The software is free, but you need to test it before class. You can get help from C&IT at 313-577-4357 or [helpdesk@wayne.edu](mailto:helpdesk@wayne.edu).
4. An updated Zoom account linked to your Wayne State AccessID, e.g. aa1234. It is strongly preferred you can move to breakout rooms on your own. Contact C&IT for help.

**Objectives** The brain is made up of cells, the fundamental unit of life. As neuroscientists, to understand the brain you need to have an in depth understanding of cells. Indeed, this class is a foundational class for any Neuroscience major or minor. By looking closely at the structure and function of each intracellular organelle, as well as specific classes of proteins, this course will help you develop a model of neurons and glial cells as the living machines underlying brain function. While neurons and glia will be emphasized, other cell types are discussed when they best illustrate important principles of cell function and activity.

**Learning Objectives** Living organisms are made of cells that work by following a number of basic chemical and physical principles. Our goal is to develop a deep understanding of how and why cells work the way that they do. The depth of our study is highlighted by the formal learning objectives of this class. By the end of the course students will be able to

1. describe the basic structure of a eukaryotic cell and its different compartments (organelles)
2. integrate the relationship between an organelle’s structure and function within different cells
3. model how molecules necessary for an organelle’s function are routed to the correct organelle
4. depict the flow of information within a cell and between cells (especially neural transmission)
5. predict outcomes when information flow within a cell or between cells is not correctly regulated
6. reconstruct how a cell grows, duplicates, and dies
7. create a dynamic model of a cell and its behaviors under different conditions.

**Prerequisites** The prerequisite for this class is Bio1510 with a C- or better, or transfer of equivalent courses. The Department of Biological Sciences is strictly enforcing the prerequisite for Bio2550.

**Grade Scale** Grades will be calculated on the following scale:

	A	92.5-100%	A-	90.0-92.49%	
B+	87.5-89.99%	B	82.5-87.49%	B-	80.0-82.49%
C+	77.5-79.99%	C	72.5-77.49%	C-	70.0-72.49%
D+	67.5-69.99%	D	62.5-67.49%	D-	60.0-62.49%
	F	0-59.99%			

<b>Grade Breakdown</b>	Mini-lectures (ML)	(5 pts x 13; 15 tries, drop 2)	65	13.0%
	Synch Activities (SA)	(5 pts x 11; 13 tries, drop 2)	55	11.0%
	Discussions (D)	(10 pts x 9; 11 tries, drop 2)	90	18.0%
	Study Guides (SG)	(17 pts x 4; no drops)	68 points	13.6%
	Surveys (SR)	(3 pts x 4, no drops)	12	2.4%
	Quizzes (Q)	(4 pts x 22; 24 tries, drop 2; and 2 pts x 1)	90	18.0%
	Unit Exams	(40 pts x 3, drop 1)	80	16.0%
	<u>Final Exam</u>	<u>(40 pts x 1, no drop)</u>	<u>40</u>	<u>8.0%</u>
	<b>Total</b>		<b>500 points</b>	

**Drop Policy** I will drop the **two** lowest assignments for each category of Mini-Lectures (ML), Synchronous Activities (SA), and Quizzes (Q); and **one unit** exam. Missed assignments (0 points) may be the dropped items. All drops are automatic. You do not

need to make a request. This drop policy is so if you miss a week or two of class for reasons including technical, personal health, family obligations, COVID, work, other class work, forgetting, disorganization, personal choice, etc. This is instead of individual accommodations. To be fair to all students, you will lose points for any additional missed assignments.

The final exam cannot be dropped. The two critical preparation assignments for the study guides, SR-Atr and SR-PR, cannot be dropped and **must be completed satisfactorily before** you can earn credit for any SG assignments.

### Late Policies

For technical, practical, and educational reasons there are no late submissions for mini-lectures (ML), quizzes (Q), or exams. If you engage in class but submit your reflection late for synchronous activities (SA), you have a grace period of 24 hours after the deadline for a deduction of 1 of the 5 points. Study guides (SG) will have a grace period of 48 hours, but your work will not be included in the peer review, and will lose the 2 peer review points. All grace periods are automatic. You do not need to make a request. For SR-Atr and SR-PR assignments there is a 1-point deduction per 24 hours after the deadline.

### Individual Exceptions

Students often want to let me know why an assignment is late or missing and I appreciate knowing how you are doing. For some issues I can refer you to resources to help. Because I have over 350 students I ask you to [use this form](#) to let me know why an assignment is missing or late, if you want to. **This is completely optional.** I will help with a referral if I can, and keep the information in my gradebook. This information may be taken into account for students who are on the very border of two grades at the end of the semester, which is rare.

If you have jury duty, a mandatory court date, military obligation, or religious obligations that conflict with class, [use this form](#) to let me know what the conflict is, the date(s), and whether or not you will miss any exams.

### Curving and Extra Credit

I do not curve grades. I structure the course so all students can succeed by helping each other, not competing with each other for grades.

### Study Cycle

The key to success in this course is using the Study Cycle. It includes

- **Preview** (Mini-lecture viewing and Perusall Discussion)
- **Engage** in class (Synchronous Activities, Zoom breakouts, MS Teams)
- **Review** (Organize what concepts you need to work on after class)
- **Study** (Study Guide creations, Quizzes, teams, Drop-in hours)
- **Assess** your processes and achievements (quizzes, teams, exams)

It will take hard work and discipline, but everyone should be able to meet their goal for the course by creating smaller goals and strategies, and following through all semester at the level of their goal. The course structure is set up to help you meet your

course goals by breaking the work into small achievable tasks using the Study Cycle. For more on the Study Cycle see *Teach Yourself How to Learn* by Sandra McGuire in the Wayne State Library (eBook); and see our Canvas site and the course components below for how to apply it in this course.

## ASSIGNMENT DESCRIPTIONS

- Mini-lectures** The purpose of the mini-lecture assignment is to help you prepare for Zoom class. You will watch pre-recorded mini-lectures and discuss them with your team in Perusall before class on Mondays. For each assignment, you must go to Perusall from the Canvas assignment. Perusall has an automatic grading system that I monitor to make sure it is accurate, reasonable, and fair. Fifteen 5-point assignments; drop the two lowest; 65 points total.
- Synchronous Activities** You will attend class in Zoom and work with your team on activities and discuss your work with the whole class. You will earn credit for participating by completing an individual reflection in Canvas of what you learned or were still unsure of in class. Synchronous class will usually be on Mondays. The first week of the semester, we will also meet on Wednesday (1/13). The second week of the semester we will meet on Wednesday (1/20), instead of the Monday MLK holiday. Thirteen 5-point assignments; drop the two lowest; 55 points total.
- Study Guides** Each week you will create a study guide with representations of the core ideas. You will have broad discretion on how you want to represent the material, including writing paragraphs. Four 17-point study guides; none dropped; 68 points total.
- Quizzes** Each chapter you will complete a multiple choice quiz in Canvas. You also will complete a quiz before each unit exam and the final exam. You will have unlimited attempts and the best attempt will count. The quizzes will be open book, open neighbor, and I will help you in drop-in hours. One 2-point Q0 survey quiz at the beginning of the semester will tell me what the class already knows. You will earn the 2-points for making a reasonable effort. Twenty-four quizzes; drop the two lowest, plus the two points for the Q0 quiz; 90 points total.
- Exams** You will have three unit exams and one final exam. Each unit exam will be 40 points. The final exam will be 40 points. Unit exams will be during class time on Mondays. The final exam will be during the University-assigned final exam time. Exams will be online in Canvas. You will not need a webcam and will not need the lockdown browser. Three unit exams, drop the lowest, and one mandatory final; 120 points total.
- Surveys** Surveys will help you know how to succeed in the course by knowing the syllabus, and by preparing for the Study Guide assignments; and will give me feedback how things are going. Each survey is 3 points; 12 points total.

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**Course Assignments Schedule.**

Week	Chapters	Mini-Lect	Synch Act	Exams	Discussion	Quizzes
Due	Due 9:45 am Mondays		10-11:15 am Mon Due 11:59 pm	10-11:15 am Mon	Study, Discussion; due 11:59 pm Weds, but 9:45 am exam days	
Hrs/wk*	2	3	1.5		4.5	1
Points		5 pt/ML	5 pts/SA	40 pts/Ex	10 pt/D 17 pt/SG 3/SR	4 pts/Q
Total**		65 pts, 13%	55 pts, 11%	120 pts, 24%	170 pts, 34%	90 pts, 18%
1 1/10-1/13	Orientation 1 Cells	ML01-113#	SA01-111 SA02-113 W		SR-Syll, 3 pts D01-113	Q0-P, 2 pts Q01-Ch1
2 1/14-1/20	2 Chem 3 Enzymes	ML02-120 Wed	SA03-120 W		SR-Atr, 3 pts SR-PR, 3 pts D02-120	Q02-Ch2 Q03-Ch3
3 1/21-1/27	4 Proteins 5 DNA	ML03-125	SA04-125		D03-127 SG1-U1	Q04-Ch4 Q05-Ch5
4 1/28-2/3	U1 Review	ML04-201		<b>Exam1-201</b>		Q06-U1
5 2/4-2/10	6 DNA Rep 7 to RNA	ML05-208	SA05-208		D04-210	Q07-Ch6 Q08-Ch7
6 2/11-2/17	8 Reg Exp 9 Evolution	ML06-215	SA06-215		D05-217	Q09-Ch8 Q10-Ch9
7 2/18-2/24	10 Genes 11 Memb	ML07-222	SA07-222		D06-224 SG2-U2	Q11-Ch10 Q12-Ch11
8 2/25-3/3	U2 Review	ML08-301		<b>Exam2-301</b>		Q13-U2
9 3/4-3/10	12 M Trans 13 Energy	ML09-308	SA08-308		SR-310, 3 pts D07-310	Q14-Ch12 Q15-Ch13
3/14-3/20	<i>Spring Break</i>					
10 3/11-3/24	14 Energy 15 Compart	ML10-322	SA09-322		D08-324	Q16-Ch14 Q17-Ch15
11 3/25-3/31	16 Signals 17 Cytoskel	ML11-329	SA10-329		D09-331 SG3-U3	Q18-Ch16 Q19-Ch17
12 4/1-4/7	U3 Review	ML12-405		<b>Exam3-405</b>		Q20-U3
13 4/8-4/14	18 Division 19 Genetics	ML13-412	SA11-412		D10-414	Q21-Ch18 Q22-Ch19
14 4/15-4/21	20 Tissues	ML14-419	SA12-419		D11-421 SG4-Sem	Q23-Ch20 Q24-Sem
15 4/22-26	Review	ML15-426	SA13-426			
4/27-5/4	<b>Final-503, 8-10 am</b>					

\* This row is the time I expect each item will typically take you each week to earn an A (10-12 hours/week). This aligns with national and [Wayne State guidelines](#) of **at least 12 hours a week on a 4-credit course during the semester**. In a traditional lecture course this is 1 hour in class and about 2 hours outside of class per credit for a regularly prepared student. Because of the pandemic, where this work takes place shifted, but the overall commitment of time is the same.

# Many assignment names indicate the date it is due with the three digits after the dash (-MDD).

The brief Chapter titles in the previous schedule are expanded below.

1. Cells: The Fundamental Units of Life
2. Chemical Components of Cells
3. Energy, Catalysis, and Biosynthesis
4. Protein Structure and Function
5. DNA and Chromosomes
6. DNA Replication and Repair
7. From DNA to Protein: How Cells Read the Genome
8. Control of Gene Expression
9. How Genes and Genomes Evolve
10. Analyzing the Structure and Function of Genes
11. Membrane Structure
12. Transport Across Cell Membranes
13. How Cells Obtain Energy from Food
14. Energy Generation in Mitochondria and Chloroplasts
15. Intracellular Compartments and Protein Transport
16. Cell Signaling
17. Cytoskeleton
18. The Cell-Division Cycle
19. Sexual Reproduction and Genetics
20. Cell Communities: Tissues, Stem Cells, and Cancer

#### **General Policies:**

**1) In fairness to the vast majority of the class who does not cheat, and to maintain the value of your grades, anyone caught cheating will receive a failing grade for the exam or class, have a temporary or permanent record of violations in their record, and may be expelled.**

For mini-lectures, synchronous activities in class and discussion sessions, study guides and weekly quizzes for this class you are encouraged to work with other people and look up answers while you are working. The point is to learn the material, so use these activities to help you reach that goal. Knowing to get help during the learning phase is a sign of a good student, so this is not cheating. You must answer the questions in your Canvas and Perusall accounts yourself, and short answer and essay questions must be entirely in your own words, or used with proper attribution, so you maximize your learning and are evaluated on your accomplishments. **It is cheating to get or give help on evaluations, such as exams.** If you are not sure when you are allowed to get help in this or another class, please ask for clarification. For discussions of cheating see the “Student Code of Conduct,” which can be found at [doso.wayne.edu/assets/codeofconduct.pdf](https://doso.wayne.edu/assets/codeofconduct.pdf)

Plagiarism is also cheating. You are responsible for knowing what plagiarism is. You will have resources and an assignment to help you build your confidence and skills in note-taking and appropriate attribution, because I am not trying to catch you plagiarizing. To protect your intellectual property and that of others, plagiarism will be reported. See the “Student Code of Conduct,” which can be found at [doso.wayne.edu/assets/codeofconduct.pdf](https://doso.wayne.edu/assets/codeofconduct.pdf), for procedures and penalties.

2) **Students who have accommodations for disabilities on file with Student Disability Services should email me their accommodation letter as soon as possible, so I can arrange their accommodations.** There is no retroactive accommodation to before I know of the issue. You need to register documented disabilities with Student Disability Services for coordination of your academic accommodations. They need a week or more to arrange accommodations, so make an appointment early. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TTY: telecommunication device for the deaf; phone for hearing impaired students only). They are meeting virtually during the pandemic. Please refer to the SDS website for further information about students with disabilities and the services we provide for faculty and students: [studentdisability.wayne.edu/](http://studentdisability.wayne.edu/) **If accommodating you will require advance preparation, please contact me as soon as possible, even if your paperwork is not yet completed.**

3) **Email guidelines:** Email is best only for quick questions that do not belong on the Discussions board because they are **personal**. I am happy to discuss longer biology content questions during drop-in hours. Please communicate what you want me to discuss more of in Perusall or the Discussions Board. I cannot reply to emails when the answer can be found in the syllabus or on Canvas, because this would take too much time from running the course for everyone.

I will respond to most emails within **two business days**. After two business days, you may email me again. **Due to privacy laws and for professionalism you must email me from your WSU email account or from Canvas.** I expect emails to be in a professional style, with a subject line that describes your course number and a description of the issue (not just your name, or just the course number), a proper greeting, e.g. "Dear Professor Myhr," a proper salutation, e.g. "Sincerely, Chris Smith," correct punctuation including capitalization and no texting abbreviations. Emails that do not follow these rules may go into spam or take longer get a reply. If I cannot figure out what you want, I cannot help you. Following these email guidelines even outside of this course will enhance your success at WSU and beyond.

4) Letters of recommendation are to give people an idea of who you are beyond the grades and classes on your transcript. **Therefore I do not write letters for students who I only know from my classes.** You are likely to need letters from professors. Start planning now how you will get involved on campus so you will have professors who know you well enough to write a letter for you. Examples of how you can get involved include doing research with a professor ([urop.wayne.edu](http://urop.wayne.edu)), joining a student organization ([doso.wayne.edu/org-services](http://doso.wayne.edu/org-services)), joining a learning community as a member or peer mentor ([wayne.edu/learning-communities/](http://wayne.edu/learning-communities/)), or becoming a learning assistant or supplemental instruction leader ([success.wayne.edu/pal/si/](http://success.wayne.edu/pal/si/)).

5) **Withdrawals:** If you request a withdrawal, you will receive a WN on your transcript if you never completed any assignment; a WP if you have greater than 60% of the points possible at the time of your request; or a WF if you have less than 60% of the points possible at the time of your request. No exams or other grades are dropped in this calculation. In Academics: select "Course Withdrawal" from the Registration Menu under Student Resources. A **\*\*\*SMART Check\*\*\*** is required. After the registrar

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processes your request they send it to Dr. Myhr to assign a grade. It can take up to five business days after I receive your request for processing. For dates see the [academic and registration calendar](#).

6) University closures will be publicized through:

- the university emergency broadcast system ([broadcast.wayne.edu](http://broadcast.wayne.edu)),
- WSU Homepage ([www.wayne.edu](http://www.wayne.edu)),
- the University Newsline (313) 577-5345,
- WDET-FM (Public Radio 101.9)

If the university is closed for business (not just the campus due to COVID), the closure includes lecture, any team meetings, and office hours. If a unit exam is scheduled on a day when the University is officially closed during class in a way that prevents us from taking the exam, the exam will be held during the next scheduled meeting of lecture that occurs when the University is open, or as indicated on our Canvas site. I will give you instructions through Canvas or WSU email (or possibly Academica if things are going particularly badly) as soon as possible if there is a closure or emergency.

8) For any and all issues not covered in this syllabus, refer to the “Student Code of Conduct,” which can be found at [doso.wayne.edu/assets/codeofconduct.pdf](http://doso.wayne.edu/assets/codeofconduct.pdf)

9) Updates to this syllabus and schedule may be posted on the course Canvas website at [canvas.wayne.edu](http://canvas.wayne.edu). You are responsible for checking Canvas announcements and your University email account. I recommend checking at least once each business day of a semester in which you are enrolled.