

Biology 1050 – Introduction to Life
Fall 2020, 3 Credits

Instructor: Dr. Karen Myhr

Office Hours for Dr. Myhr: Office hours are in Canvas during scheduled class times when we do not meet for activities

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Office Phone: 313-577-1504 (usually voicemail to my email, so it is faster to email directly)

Course website: canvas.wayne.edu

Grader: Ahmad Zunnu Rain, ez5569@wayne.edu

Learning Assistants:

Antara Raul, gp3895@wayne.edu

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Class Meetings: This course is fully online, not face-to-face. Class meets in Canvas 2:30 pm to 3:45 pm on Tues. and Thurs. Some meetings will be required team activities or exams. Remaining meetings will be optional drop-in hours. A schedule will be posted in Canvas. While you are expected to attend when we have a team activity, when that is not possible there will be an alternative for earning credit.

Objectives: The overall goal of the course is for you to demonstrate an understanding of basic biology from molecules to ecology and evolution, as stated in learning objective 4. This goal depends on your acquiring the skills necessary for you to learn biology effectively, as stated in learning objectives 1-3.

Learning Objective 1 is that you *set a goal, and a strategy* to meet your goal at the beginning of the semester, and reevaluate your goal & strategy after each exam.

Learning Objective 2 is that you *use the tools & resources* for this course, including learning communities, homework assignments, lectures, textbook, and the academic success center, to help you achieve your goals.

Learning Objective 3 is that you *assess your own learning* to evaluate how to improve by using the assessment tools.

Learning Objective 4 is that by applying the first three objectives in the context of biology throughout the semester, you will be able to demonstrate that you are an educated consumer, patient and voter in issues related to biology, and you are able to succeed in biology courses that you enroll in later.

This course fulfills the General Education requirement for Natural Science Inquiry (NSI).

After successful completion of this requirement, students will be able to demonstrate their ability to:

- Explain natural phenomena using scientific concepts, theories and/or principles.
- Describe the process of scientific inquiry.
- Analyze historical or contemporary societal subjects using scientific concepts and principles.

Required Materials: *Biology: Concepts & Connections* (10th Edition) by Taylor, Simon, Dickey, Hogan, and Reece. Access to the **textbook** (any format) is required for success in this course. The book with MasteringBiology includes excellent animations but MasteringBiology is not required. I will provide alternate animations. Other editions of the book may have similar material, but I will only provide references to sections in the 10th Edition. You are responsible for finding equivalent material.

This course is participating in a pilot for the fall semester of a new course material affordability program called FirstDay Inclusive Access. This program will make course materials directly available to you on or before the first day of class. **A direct charge for the course material will be placed on your student account, and you may opt-out in Canvas until 9/15/2020.** Opting-out will result in a refund being placed against your student account. You will, however, then be responsible for sourcing the course material on your own. For information regarding the cost of the material for this course, please visit [this bookstore link](#). For questions regarding First Day Inclusive Access visit [the First Day FAQ page](#).

Because we will be meeting and working online you will need to have the technology to participate. You will need a **good internet connection, and a desktop or laptop computer with a regular size screen or bigger**. A tablet will probably work, but it would be very difficult to do your course work on a phone. We will not be using specialized software outside of the browser and office software that you have access to free online as a Wayne State student. Note if technology is a barrier to you taking this course, please email student.laptops@wayne.edu or me at kmyhr@wayne.edu, so we can find resources for you. Wayne State does have resources and I do not want anyone to drop this course due to unmet technology needs.

Play-doh is required. Biology has complicated systems the change with time. To understand this better we will make models with play-doh. See Canvas for recommendations or recipes to make your own.

SCHEDULE OVERVIEW (See Canvas for changes. Learning Objectives are at the end of the syllabus.)

Assignment	Dates	Topic	Activities
Integrity	9/1-9/8	Life, Diabetes	Team building. Orientation. Diabetes.
	9/7	<i>Labor Day</i>	<i>Labor Day</i>
Feedback	9/2-9/10	Homeostasis	Team building. Homeostasis.
1	9/10-9/17	Organ systems, membranes	Cardio Kiara game
2	9/17-9/24	Energy, cellular carbon cycle	Card sort cellular carbon cycle
3	9/24-10/1	Proteins	Careers. Digital DNA models.
4	10/1-10/8	Nucleic acids	Card sort replication, transcription, translation
5	10/8-10/15	Transcription, translation	SARS-CoV-2 discussions
	10/15-10/20	Midterm Exam	Exam
6	10/20-10/27	Regulation of cell division	Exam wrapper. Classes for next semester.
7	10/27-11/4	Life cycle, mitosis	Play-doh mitosis
	11/3	<i>Vote</i>	
8	11/4-11/10	Meiosis	Card sort mitosis/meiosis
9	11/10-11/17	Reproduction	meiosis → fertilization → inheritance
10	11/17-11/24	Inheritance	Inheritance problem solving
	11/25-11/27	Thanksgiving break	
11	11/24-12/3	Evolution	Food laws debate. Draw carbon cycle from molecules to ecosystems.
12	12/3-12/10	Ecology	Aquatic ecology case study and concept map
	12/10-12/16	Review. Final Exam 2:45 to 4:45 pm on 12/17.	

GENERAL COURSE INTERACTIONS

Individual Students with the Content

- You will interact with the content through reading, videos, animations, and assignments
- You will assess yourself with quizzes and exams

Students Interact with Students on Canvas

- Teams of about seven students will interact in team areas with chat and discussion boards
- Your team will work together on team activities in a breakout room during class time
- You will exchange feedback with other students on create-to-learn assignments
- The whole-class will interact in discussion boards on content and practice quizzes

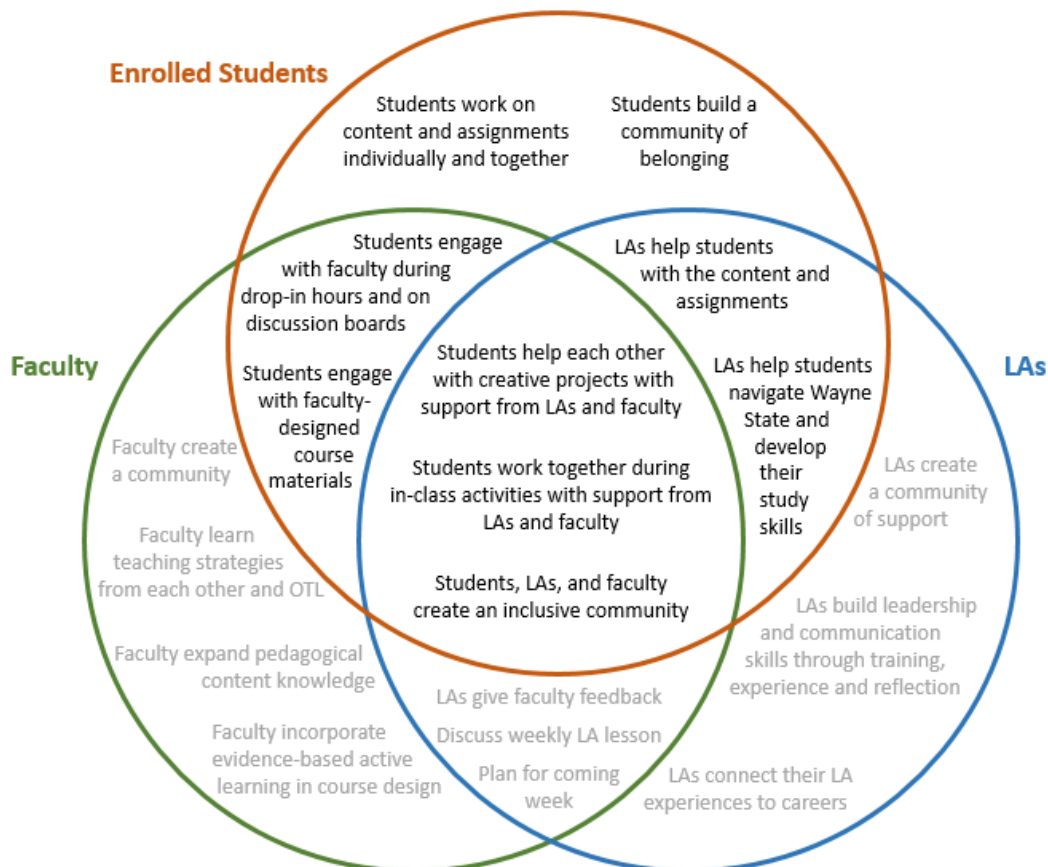
Learning Assistants (LAs) Interact with Students

Teams will be guided by Learning Assistants (LAs). The LAs are successful upper-level undergraduate students. They are trained to help you with this course and navigating Wayne State. They are a resource for your success in this course and at WSU.

- LAs will facilitate your team area, discussion boards, create-to-learn work, and in-class activities
- You will also be able to meet individually with your LA

Instructor Interacts with Students

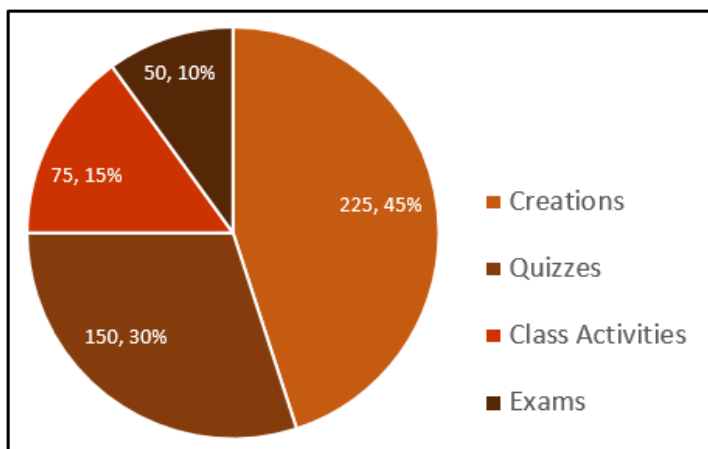
- I will provide you with course materials, including assignments, resources, and videos
- I will lead the whole class in in-class activities
- I will chat with you during drop-in hours in class times or individually, by appointment
- I will post in discussion boards when the whole class can benefit, or email for personal issues



GRADES AND ASSIGNMENTS

GRADE SUMMARY

Assignment	Points	%
Creations	225	45
Quizzes	150	30
Class Activities	75	15
Exams	50	10
Total	500	100



Grading Policy: Grades will be calculated on the following scale:

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

I do not curve grades. Everyone can earn an A, if they perform well. I do not offer any extra credit. Instead, I offer many ways to help you succeed throughout the semester.

CREATE-TO-LEARN (45%)

Purpose: The purpose of these assignments is to learn the content for the week by creating your own representation of the topic. The reason these assignments will help you learn deeply is that by creating you will be making more connections between concepts (more synapses to rely on when you want to use the information later). Other reasons these assignments will be effective (and fun) is that you will interact socially with your classmates on your work. You will also get feedback from peers, your LAs and your grades to help you continuously get better at creating representations of biology through the semester.

Structure: There are foundational assignments to help you build skills for the weekly assignments.

Foundational Assignments. First there are two assignments to help you understand the work and process. One assignment is on giving and receiving constructive feedback, and one is on academic integrity, i.e. what it means to create your own representation and why it is important that it is your own work.

Weekly Assignments. You will create your representations of a core learning objective for each week in any format that works for you. I will provide some suggestions, but any format goes – from writing paragraphs to creating concept maps, infographics, a series of memes, poetry, sculptures, podcasts, to songs. You need to work in English, though. You will give and receive constructive feedback first to your team, then individually with two of your classmates. Finally, we will all enjoy a showcase of nominated and selected work for the week. This is so you can share your work with others who are learning with you, and so you can learn from each other.

Supports: You will be given learning objectives and guides to work for each week. Through the semester, examples of work that meet or exceed expectations will be shared with the whole class, with feedback about what makes the work effective at communicating the learning objective.

You are also responsible for getting feedback from your team in your team area in Canvas or Teams before you submit. Sharing ideas and progress this way is a great way to learn from each other. We will have one undergraduate learning assistant (LA) for each cluster of six teams. Your team will have about seven students. Your LA will help you work together on your creations while you work on them in your team area. Each team will nominate one project each week for the LA pick of the week. Each LA will pick two projects from their teams as LA picks of the week. All of the picks will be displayed in a showcase for the class to enjoy and learn from.

Policies: Your work must be original. There will be an assignment on academic integrity at the beginning of the semester so everyone is clear on why work must be original, and what that means. For technical reasons, you need to submit your own creative response by the deadline to be included feedback part of the assignment.

Grades: In order to prepare to create representations of the learning objectives, you will complete two **foundational assignments**; one on academic integrity and one on constructive peer feedback. Each assignment will be worth 10 points. You will not be able to submit the creative assignments until your foundational assignments are done.

For each of the 12 **creative representation** assignments, you will earn 2 points for meeting expectations for each key element. The key elements are the seven C's - being **C**orrect, **C**omplete, **C**lear, **C**onnected to your life or other knowledge, **C**reative, **C**ontemplative about how the work helped you learn, and **C**onstructive in your feedback. The elements total 14 points. You may earn up to 3 additional points per assignment for exceeding expectations.

You will also be able to earn 10 points for completing two surveys (5 points each). One is a mid-semester survey to give me feedback on what is working for you about the course and what you would like to change about the course. The other will be towards the end of the semester to assess what the course has accomplished for the class as a whole.

If you meet expectations, you will earn 198 points of 225, which is a B. That breaks down into 20 points for two foundational assignments, plus 168 points for creations (12 creations x 14 points), and 10 points for two 5-point surveys. To earn a perfect score you will need to exceed expectations on your creative projects multiple times.

SYNCHRONOUS IN-CLASS ACTIVITIES (15%)

Purpose: The purpose of the weekly synchronous activities is to work together on an activity that builds on the work you do through the week. This will help you learn the material by working with the material another time, practicing recall, making new connections to what you know, and learning in a social environment. All of these elements have been shown to be important for effective learning.

Structure: About once per week during class time from 2:30 to 3:45 pm on Tuesdays and Thursdays, we will meet in Zoom. Class days without activities or a midterm exam are optional drop-in times for Q&A with me. For activities, each team will work together in a breakout room for most of the session.

1. We will gather in breakout rooms before class to chat in teams until class time.
2. I will set up the activity and clarify issues in one main room (~10 min)

3. You will do activities in teams in breakout rooms (~50 min)
4. We will return to main room to share what teams did (~15 min)

Technology: I encourage you to turn on your microphone and video during the activities with your team to have the best experience. However, I understand that this may be intrusive, like inviting us to have class in your home, which you may not want to do every session. There may be reasons not to have video or audio on, such as limited or expensive bandwidth or distractions in your environment. You are welcome to blur your background or insert a picture for a background, if you wish. If you need to keep your video off, or type in the chat instead of speaking we understand and will work with how you can interact. I recommend adding a picture of yourself or an avatar instead of video so we can feel like you are more present.

For most activities, you will interact with your team in Zoom video conference while working on a common document in a separate window. As noted in the Required Course Materials, this will require a screen bigger than most phones. A tablet or computer is recommended. Email Student.laptops@wayne.edu if you need a computer. You will not need special software other than an updated recommended browser, Microsoft Teams, and Microsoft office, which are free to all students.

Supports: Your LA will circulate among the breakout rooms of the teams during activities.

Policies: Engaged participation is expected for each synchronous activity, but I understand that we are in a pandemic and unexpected events out of your control may keep you from participating each week.

If you must miss a session, you are expected to watch the video of the parts of class when we are in one room together for important information. You will also need to coordinate with the Synchronous Activities Learning Assistant, Jake Kosteke (gg3827@wayne.edu) to make up the work. This will take more effort than attending class at the regular time because it will involve scheduling a time to meet with other students who missed to do the activity, but it will be an opportunity to do the activity. In cases where students cannot meet with anyone else, they may be able to make up the learning and points individually, but this will be difficult for some assignments like the debates.

Grades: Each student will submit the work in Canvas by 5 pm. The work typically will have three parts.

1. Submission of the work itself, for example a completed worksheet
2. A list of who contributed
3. A statement of who contributed what, and whether the contributions were equal

You will earn up to 6 points for each week that you participate in the synchronous activity with your team during class time online up to a maximum of 75 points. There will be 14 opportunities to earn these points (84 point opportunities total), so you can still earn a perfect score if you miss some of the points. In the rare event that you miss class, you also will have opportunities to complete the work as described in Policies.

QUIZZES (30%)

Purpose: The purpose of the **weekly practice quizzes** is to extend your learning from reading, mini-lectures and create-to-learn by practicing recall and application. The purpose of the **unit quizzes** is to evaluate what you learned from the other work. Unit quizzes are great feedback for the exams.

Structure:

Practice quizzes will open at the beginning of a unit in Canvas, and will have weekly deadlines. Unfortunately, the quiz will not be available after the deadline for technical reasons. You are encouraged to work with other students, LAs, and me to learn from the practice quizzes, but you must answer your quiz yourself. Practice quizzes are open book and other resources; open classmate, LA, instructor, or anyone; all questions at once, unlimited attempts, untimed, and the best attempt before the deadline counts for your grade. Each quiz will have eight questions, for eight points.

Unit quizzes are open resources like the practice quizzes, but unlike practice quizzes the unit quizzes are 13 questions, one attempt, limited to 25 minutes, and you will justify your answer for some questions. You must write your justifications yourself in your own words.

Both the practice quizzes and unit quizzes will be multiple choice questions. Each time you take a quiz it will pull a different set of questions from a pool of many questions with the answers in a scrambled order. This is so you practice thinking about the questions, instead of memorizing them.

Supports: You are encouraged to work with each other on the practice quizzes. There will be whole-class discussion boards so you can post and get answers to challenging quiz questions quickly. LAs and I will discuss the questions and answers.

Policies: You must enter the answers to all of your quizzes yourself. Both practice quizzes and unit quizzes are open resources, but you must write your justifications on the unit quizzes in your own words.

Grades: Quiz points are capped at 150 points of 158 point opportunities. This means if you miss some points, you can still earn a perfect score.

- 12 weekly quizzes are 8 points per quiz (96 point opportunities).
- 4 unit quizzes 13 points each (52 point opportunities)
- 2 quizzes for me to assess where the class is starting from and what you accomplish (5 points each based on effort, for a total of 10 point opportunities)

EXAMS (10%)

Purposes: Studying for cumulative exams helps people review what they have learned and make new connections among concepts. Both review and expanding connections strengthen your networks of neurons and make your knowledge and skills more useful in the future. Exams also give credit for the knowledge and skills you gained by doing the work of the course.

Structure: Exams will be timed in Canvas during class or final exam time. Each exam will cover all the work in the class up to the exam. The format will be varied, and may include representing a topic in an open format, short answers, reflections, multiple choice questions, multiple answer questions, fill-in-the-blank, justifications of answers, or other types of questions. The exams are supported by the work you do in the class up to the exam. I will post more information about the exams as you get closer to taking them.

Policies: The midterm and final exams will be open resources, on your own (no help from other people), one attempt, one question at a time, no backtracking to previous questions, and timed. The midterm will be from 2:30 to 3:45 pm on October 20, 2020 (during class time in Canvas).

The final exam will be in Canvas during [the university-scheduled final exam time](#). This will be 2:45 to 4:45 pm on Thursday, December 17, unless the university changes the schedule. Note that the last day of all classes for the semester is Monday, December 14. Tuesday, December 15 is Study Day, which means there are no classes and no exams may be scheduled, although you could be working on a take-home exam that is due during exam week. Final exams for the university are scheduled during final exam week from Wednesday, December 16, through Tuesday, December 22.

Grades: Each exam 25 points, total 50 points. Fifty points is 10% of your course grade.

GETTING HELP

Getting help is what successful students do. You can get help many ways from this course and Wayne State more broadly.

For **questions on content** the best way to get help is to post to the Discussions board in our Canvas site. I will answer and students will answer, often faster than I can, or the LAs can. The benefits of this approach is that you can also see the answers to other students' questions, and build your own knowledge by answering when you know the answer. I also will answer the most difficult questions from the Discussions board and live questions during class time.

For **questions on course policies or grades**, first check this syllabus. If that does not answer your questions, then decide if your question is of general interest or personal. If the question is of general interest, post to the Ask and Answer Discussions board Canvas. If the question is personal, email me at kmyhr@wayne.edu. An example of a question of general interest is "How do the points work for quizzes?" An example of a personal question is "I think there is a mistake in my grade because..."

For **technical questions** about how to navigate our course Canvas site, Canvas in general, Wayne State technology, Wayne State organization, etc. you can post to the Ask and Answer Discussions board. Your classmates and I will not always know the answer, so for technical questions it may be faster to contact Computing and Information Technology at 313-577-4357 or helpdesk@wayne.edu.

For **personal questions** email me at kmyhr@wayne.edu. You can also set up an individual conference by completing [this form](#) that gives me the information I need to schedule a meeting. You also can phone me at 313-577-1504, but this phone is on campus, so it is forwarding messages to my email. It is usually easier for me to read an email than to listen to a message.

For **science, career, or life questions that are beyond the content of the course**, post to the "I was Just Curious..." Discussions board. You also can join the virtual STEM Commons and interact with other Science, Engineering and Math students and faculty at book clubs, panels and faculty chats (canvas.wayne.edu/enroll/D77PP9). You can also ask these questions at student drop-in hours.

Good students get help with **study skills**. Attend free workshops or a free private virtual session with a learning specialist in [the Academic Success Center](#). Check [their website](#) for details. Also check out their [new LearnAnywhere site](#).

It is quite common for college students to experience mental health challenges, such as stress, anxiety and depression that interfere with academic performance and negatively impact daily life. Help is available for any currently enrolled WSU student who is struggling with a mental health difficulty.

Contact **Counseling and Psychological Services (CAPS)** at caps.wayne.edu (Room 522, Student Center) 313 577-3398. See the FAQs on Canvas for additional tips on managing anxiety.

Students benefit from a sense of belonging. If you feel alone at the university check out the programs and groups that facilitate belonging at [the Office of Multicultural Student Engagement \(OMSE\)](#) (Room 799 in the Student Center).

For veterans or those in the military [Office of Military and Veterans Academic Excellence \(OMVAE\)](#) (Rm 687, student Center) helps you connect with students with similar experiences, and get resources.

GENERAL POLICIES

1) **Email: You must email me from your WSU email account or from Canvas because the WSU email system blocks some email from other addresses, and to comply with privacy laws.** Communicating effectively is important for your success at WSU and beyond. I expect emails to be in a professional style, with a subject that includes what the issue is and what class you are in with me, a proper greeting, e.g. "Dear Dr. Myhr," a proper salutation, e.g. "Sincerely, Chris Smith," correct punctuation, and no texting abbreviations. If I cannot figure out what you need, I cannot help you. These habits will help you succeed at Wayne State and beyond.

2) To request accommodations for civic duties (jury duty, court dates, or military service), WSU travel, religious holiday conflicts, etc., or issues related to the pandemic, email kmyhr@wayne.edu as soon as possible with an explanation of your request and documentation, if appropriate. Arrangements will be made on an individual basis balancing the needs of the individual and the class overall.

If you have a conflict with the final exam time **as defined by the rules of the University** (wayne.edu/registrar/registration/exam-schedule/), please notify me as soon as possible, and at the latest by 12/10/2020. Exceptions are not made for personal travel plans, even if it is for specific important events like weddings.

3) If you have a documented disability that requires accommodations, you will need to register with Student Disability Services for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. The SDS telephone number is 313-577-1851 or 313-202-4216 for videophone use. I am glad to meet with you [privately by appointment](#), to discuss your needs and accommodations. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University. You can learn more about the [disability office here](#).

To register with Student Disability Services, complete [their online registration form](#).

4) University closures will be publicized through the University Newline (313) 577-5345, WSU Homepage (www.wayne.edu), WDET-FM (Public Radio 101.9), and by other local radio and television stations. You should set up your **WSU Broadcast Messaging settings in Academics** under Resources>University Resources in the left menu so you get notices the way that works best for you.

Since this course is online, building closures will not affect us, but with the pandemic there may be other policies and procedures announced through these channels. Stay informed. Stay safe.

5) Professional and respectful behavior is expected in all parts of this course. You are encouraged to discuss differences of opinion with each other respectfully. Students who do not respect others will be asked to leave, and will lose any points for that day. There are hundreds of students in the class in addition to you. Please balance your own needs with those of the class.

6) I do not write letters of recommendation for students who I only know through a lecture course. I need to be able to tell a first-hand story about you that will help you get a position. Consider getting involved beyond just your classes at Wayne State to get strong letters of recommendation.

7) **Withdrawing:** I encourage you to get help instead of withdrawing. See the GETTING HELP section of this syllabus to find help that meets your needs, so you can save money and graduate sooner. If you need to withdraw, see the website for the Office of the Registrar (reg.wayne.edu/withdrawing-from-a-course) for details. If you withdraw from the course you will receive 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 or replaced in this calculation.

8) Academic Integrity

[Academic misconduct](#) is any activity that tends to compromise the academic integrity of the institution or undermine the education process. Examples of academic misconduct include:

- **Plagiarism:** To take and use another's words or ideas as your own without appropriate referencing or citation.
- **Cheating:** Intentionally using or attempting to use or intentionally providing unauthorized materials, information or assistance in any academic exercise. This includes copying from another student's test paper, allowing another student to copy from your test, using unauthorized material during an exam and submitting a term paper for a current class that has been submitted in a past class without appropriate permission.
- **Fabrication:** Intentional or unauthorized falsification or invention of any information or citation, such as knowingly attributing citations to the wrong source or listing a fake reference in the paper or bibliography.
- **Other:** Selling, buying or stealing all or part of a test or term paper, unauthorized use of resources, enlisting in the assistance of a substitute when taking exams, destroying another's work, threatening or exploiting students or instructors, or any other violation of course rules as contained in the course syllabus or other written information.

Such activity may result in failure of a specific assignment, an entire course, or, if flagrant, dismissal from Wayne State University.

I encourage you to work with other students on practice quizzes, and to give feedback on create-to-learn projects. This is learning, not academic dishonesty, but you need to enter your own answers into Canvas to earn credit fairly, and to have the quiz help you learn.

9) For any and all issues not covered in this syllabus, refer to [the "Student Code of Conduct."](#)

Unit 1: Diabetes. September 1 through September 29, 2020.

Learning Objective	Resources
1.1) Describe the unity and diversity of life .	1.1, 1.2
1.2) Describe diabetes , and compare type I and type II diabetes. UNIT THEME - Diabetes	26.8, 26.9,
1.3) Describe the levels of biological organization from molecules to organisms, including examples.	1.3, 20.2 animation – tours of cells
1.4) Describe the control systems of animals.	26.1
1.5) Describe and apply a strategy for interpreting data on graphs .	page 535, Q2; pp 85, 87
1.6) Quantitatively and qualitatively describe how the endocrine system maintains homeostasis . Explain why homeostasis is important. Identify and diagram the role of the components of homeostasis. Apply the principles of homeostasis to examples, including regulation of blood [glucose]. UNIT THEME - Homeostasis	26.1, 26.8, 26.9, animation - homeostasis
1.7) Compare potential to kinetic energy and give examples.	5.10
1.3b) Focus on tissues	1.3, 20.2
<i>End of material for week 1. Weekly quiz 1 due on September 10.</i>	
1.8) Describe how the organ systems work together to allow you to move. Include the digestive, respiratory, cardiovascular, musculoskeletal, nervous and endocrine systems. UNIT THEME – Organ Systems	6.2, 6.3, 6.4, 21.2, 22.1, 23.1, 23.2, 23.3, 26.8, 30.11
1.9) Describe the major stages and organs of digestion in mammals.	21.2, 21.4, 21.10
1.23) Diagram and describe how the blood flows through the cardiovascular system . Include the left and right heart , transport blood vessels (systemic arteries and veins, pulmonary arteries and veins), and capillaries (exchange vessels).	22.10, 23.1, 23.2, 23.3
1.10) Describe the importance and roles of glucose and ATP .	3.4, 5.12, 6.4, 30.11
1.11) Describe how glucose, ATP, muscles and the skeleton interact to generate movement .	4.16, 30.7, 30.8, 30.10 (animation muscles)
1.12) Describe the principles of diffusion and why they matter for organisms.	5.3
1.13) Describe, diagram and compare glucose and gas transport through the body, and exchange with tissues and the atmosphere. To integrate the ideas, describe the relative concentrations of oxygen, carbon dioxide and glucose in each type of blood vessel , the alveoli, small intestines and muscles . UNIT THEME – Organ Systems	22.6, 22.9, 22.10, 23.3, 23.7, animation – gas exchange; interactive ppt

1.14) Describe and diagram how the brain generally controls respiration, heart rate and motor output, and processes sensory input.	22.9, 28.1, 28.15, 28.16
1.15) Describe why cellular membranes are important. Diagram and describe how membrane structures relate to membrane function. Describe how glucose and insulin interact with cellular membranes in health and diabetes.	3.8, 3.10, 4.2, 4.4, Ch.5 intro, 5.1, 5.6, 5.8
1.16) Describe, diagram and give examples of hydrophilic and hydrophobic molecules. Describe how these properties affect permeability across plasma (cellular) membranes.	3.8, 3.10
End of week 2 material. Weekly quiz 2 due September 17.	
1.17) Describe, graph and give examples of exergonic and endergonic reactions . Predict whether a reaction is endergonic or exergonic given a description or graph. Graph the energy of the reactants and products given a description of a reaction.	2.9, 5.11
1.18) Describe the significance and process of coupling reactions by transferring energy from one reaction to another. Include examples, such as ATP to ADP and Pi, and the concept of exergonic and endergonic reactions.	5.12, 6.3
1.19) Describe, diagram and graph how enzymes control reactions. Include activation energy and active sites. Describe the importance of enzymes to life.	5.13, 5.14
1.20) Describe the significance and process of cellular respiration . Describe the reactants and products of cellular respiration in words and an equation. Describe and diagram the four stages of cellular respiration. Describe the high-energy molecules at the beginning and end of each stage. Describe the flow of the carbon atoms through the stages. UNIT THEME – Cellular Respiration	4.13, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.11, animation – cellular respiration; interactive ppt
1.21) Describe where photosynthesis takes place, why it is important and the major reactants and products of each of the two phases.	7.2, 7.4, 7.5, 7.12, animation – Photosynth; interactive ppt
1.22) Compare cellular respiration when the input is fats versus proteins versus glucose.	6.14
End of material for week 3. Weekly quiz 3 due September 24.	
End of material for unit 1. Unit 1 quiz due Tuesday 9/29.	

I will post an updated syllabus with detailed learning objectives for Units 2, 3 and 4 soon. I need to rearrange Unit 2 because I am changing the theme to SARS-CoV2.