

## SYLLABUS

### General and Pathogenic Microbiology, BIOL 3210-001 Fall 2023

**Course Description:** This is an introductory course in Microbiology with an emphasis on understanding pathogenic microbes and infectious diseases and should interest students pursuing healthcare-related professions. The course is divided into three parts. The first part delves into the general features of structure and function of bacteria and viruses while maintaining a focus on pathogens. The second part focuses on how humans combat microbial pathogens by discussing the human immune system, vaccines, and diagnostics. The last part of the course discusses some of the most relevant and common pathogenic microbes and the diseases caused by them. For Fall 2023, Biology 3210 is being taught *in-person* at regularly scheduled class times. Further details are provided in the sections below.

#### **Class Details**

**Class Location:** ASB 210 9:40AM to 10:30 AM Monday, Wednesday, Friday

**Instructor:** Naina Phadnis, Ph.D. (*She, her, hers*)

**Email:** [naina.phadnis@utah.edu](mailto:naina.phadnis@utah.edu)

**Instructor's Office:** Biology 227

**Course Structure:** This course will use instructor driven discourses on class days and times. Students are required to come to class for lectures and assessments. Lectures will include direct instruction, live student/TA chats, case study discussions and clicker comprehension checks. Knowledge and navigation of canvas is critical to access all features and resources of this course. All class presentations will also be available as recordings after class but are not expected to be a substitute for not coming to class. The course will require students to read certain parts of the textbook before class on their own (aka independent study/IS) and will be quizzed on that material on canvas before most new topics begin. Each lecture will be accompanied with a handout (available on Canvas a few days before class) and class slides (available by 9 am before class). The handouts will provide the lecture outlines, reference to textbook reading, and review questions to help you study. Lecture slides should be used by students to follow the class and take notes. All graded exams are closed book and will be held in class using the canvas quiz feature.

**Class Modality:** This course will be held **in-person**. Except in cases of ADA accommodations or quarantining due to COVID-19 exposure or infection (or another infectious illness), you will be expected to attend class in person and complete assignments and exams in person. Changes to this policy are up to the discretion of the instructor.

**Attendance:** **Timely attendance in class is required.** Note that all exams will occur during class times, in class, using the canvas quiz feature. If you miss a class lecture session due to extenuating circumstances don't fret. All class recordings will be posted to canvas. In case of illness-related hindrances or other extenuating circumstances on your attendance please notify the instructor to make necessary arrangements to make accommodations. Documentation of such restrictions or illnesses may need to be provided to get accommodations. Given the in-person nature of this course, attendance is required, and I cannot guarantee that all requests of adjustments will be granted to allow non-attendance however I will try to do my best to help you learn and complete the course.

**Course Disclaimer:** The syllabus is not a contract. Please note that I may modify the course to accommodate the needs of our class. Any changes will be announced in class and posted on Canvas. This class discusses human infectious diseases and thus certain topics, and images may make you feel uncomfortable. Please show respect, empathy and understanding for the people suffering from these diseases by avoiding immature and disrespectful behaviors during class discussions. Words pertaining to sexual intercourse will also be mentioned in context of sexually transmitted infectious diseases. I will warn students before class when sexually explicit content is going to be discussed.

**Equipment Requirement:** Even though the course is in-person, a laptop or handheld device will be needed in class to access Canvas, exams, and i-clicker. Complete participation in the course will depend on having access to a computer and a broadband internet connection, as well as being able to use Canvas, Zoom and other online resources effectively. If you are a student enrolled for Fall in need of a laptop or other technology equipment, see [Marriott Library student checkout equipment](#). If you are in need of off-campus internet access, many [Xfinity](#) and [Xmission](#) public wireless locations are free to access. [Xfinity Internet Essentials](#) is free for 2 months to qualified customers and \$9.95 in subsequent months. Students enrolled for Fall can request a mobile hotspot from [Marriott Library student checkout equipment](#). Please contact the instructor as soon as possible if you have concerns about these requirements. Further details are provided in the sections below.

**Course Schedule:** The tentative course schedule is provided below and will be updated depending on the pace of the course. However, exam dates will NOT change so please plan accordingly. You can view the updated and most current versions of the schedule on the canvas home page.

Class #	Date	Topic
		<b>Part 1: Understanding the Microbial World and Pathogens</b>
1	M, Aug 21	Introduction to the course
2	W, Aug 23	Introduction to the microbial world and Pathogens
3	F, Aug 25	Introduction to the microbial world and Pathogens (IS QUIZ 1 DUE) <i>Last day to withdraw with no tuition</i>
4	M, Aug 28	Bacterial cell structure-function with reference to pathogenesis (IS QUIZ 2 DUE)
5	W, Aug 30	Bacterial cell structure-function with reference to pathogenesis
6	F, Sept 1	Bacterial cell structure-function continued ( <i>last day to add/drop</i> )
	<b>M, Sept 4</b>	<b>LABOR DAY: NO CLASS</b>
7	W, Sept 6	Prokaryotic growth in the environment (IS QUIZ 3 DUE)
8	F, Sept 8	Prokaryotic growth in the laboratory
9	M, Sept 11	Adapting to change: mutations and gene transfer (IS QUIZ 4 DUE)
10	W, Sept 13	Adapting to change: gene transfer
11	F, Sept 15	Antibiotics and the rise of resistance (IS QUIZ 5 DUE) <i>Last day to withdraw, tuition will be assessed</i>
	<b>M, Sept 18</b>	<b>Mid term 1 (classes 1-11)</b>
12	W, Sept 20	Basics of Viruses (IS QUIZ 6 DUE)
13	F, Sept 22	Viruses continued
14	M, Sept 25	Viruses continued

<b>Part 2: Humans fight back</b>		
15	W, Sept 27	The Immune System: innate defenses (IS QUIZ 7 DUE)
16	F, Sep 29	The Immune System: innate defenses
17	M, Oct 2	The Immune System: innate and adaptive defenses (IS QUIZ 8 DUE)
18	W, Oct 4	The Immune System: adaptive defenses
19	F, Oct 6	The Immune System: adaptive defenses (IS QUIZ 9 DUE)
	<b>Oct 8-15</b>	<b>FALL BREAK-NO CLASS</b>
20	M, Oct 16	Applications of immunology: Diagnostics
21	W, Oct 18	Applications of immunology: Vaccines (IS QUIZ 10 DUE)
22	F, Oct 20	Viral disease: Polio, also a vaccine story (attacks the nervous system) (last day to withdraw)
	<b>M, Oct 23</b>	<b>Mid term 2 (class 12-22)</b>
<b>Part 3: Microbes Attack (Return of the dark side)</b>		
23	W, Oct 25	Viral disease: Influenza (attacks respiratory system)
24	F, Oct 27	Viral diseases: HIV (attacks immune system) (IS QUIZ 11 DUE)
25	M, Oct 30	Viral diseases: HIV (attacks immune system)
26	W, Nov 1	Introduction to new and emerging viruses and SARS-CoV2
27	F, Nov 3	New and Emerging Viral diseases
28	M, Nov 6	Mechanisms of Bacterial Pathogenesis (using diseases as examples) (IS QUIZ 12 DUE)
29	W, Nov 8	Mechanisms of Bacterial Pathogenesis (using diseases as examples)
30	F, Nov 10	Mechanisms of Bacterial Pathogenesis (using diseases as examples)
31	M, Nov 13	Staphylococcal Infections (IS QUIZ 13 DUE)
32	W, Nov 15	Streptococcal infections
33	F, Nov 17	Bacteria that cause Pneumonia and Tuberculosis (IS QUIZ 14 DUE)
	<b>M, Nov 20</b>	<b>Mid term 3 (lectures 23-33)</b>
34	W, Nov 22	Tuberculosis contd. and Meningitis
	<b>F, Nov 24</b>	<b>THANKSGIVING BREAK: NO CLASS</b>
35	M, Nov 27	Bacteria that cause Meningitis (IS QUIZ 15 DUE)
36	W, Nov 29	Bacteria that cause Digestive Infections
37	F, Dec 1	Eukaryotic microbial pathogens (IS QUIZ 16 DUE)
38	M, Dec 4	Microbial bioterrorists
39	W, Dec 6	Case studies (last day of this class)
	<b>Wednesday, Dec 13</b>	<b>Final Exam (8 am -10am) COMPREHENSIVE (lectures 1-39 but weighted towards 34-38)</b>

**Textbook:** *Nester's Microbiology: A Human Perspective*. 10th edition. D. Anderson, S. Salm and M. Beins. McGraw Hill, 2022. The E-book is available as **inclusive access** to students meaning the fee is part of the tuition for the course at registration time. **On the course canvas home page click on the Textbook link for instructions to access the e-book.** TEXTBOOK WILL BE ACCESSABLE ONLY ON THE FIRST DAY OF CLASSES. Students who would like to add a loose-leaf option of the textbook along with the e-book can purchase it from their connect home screen or from the bookstore. Students have first two weeks of class to use the product, test it out and decide during that time if they want to continue using the product (which they do nothing and the fee just needs to be paid as part of their tuition) or they can opt out anytime during those first two weeks of the semester and the Financial Accounting office will credit/refund their tuition account during the 3<sup>rd</sup> week after classes have started. After the first two weeks of the semester, if the student hasn't opted out, the fee then must be paid. That timeframe falls in line with the add/drop date of the U. Students who opt out of inclusive access should instead purchase the book online, rent it etc. as they like but students should know that the textbook is an absolute must for this course. More details can be found on the canvas home page and will also be given on the first day of class. Other editions including international editions are not recommended.

**I-clicker Reef Account:** This semester you will use iClicker Reef to participate in graded and ungraded polling sessions during class on zoom. iClicker Reef is the software that works with your smartphone, tablet, or laptop. I hope using iClicker Reef will make your experience in the online class more engaging and help me better understand your needs as a student. **Click on the canvas home page Clicker Set-up link for step-by-step instructions to get ready for clicker assessments.** Instructions will also be given on the first day of class.

## **Graded Assignments**

- **Independent study quizzes:** Independent study is the textbook reading and learning I need you to do on your own before class. Independent study outlines will be included in the handout, along with questions on the independent study material. Graded IS quizzes on canvas will be open book, timed and based on the independent study questions in the handout. We will have approximately sixteen independent study canvas quizzes with three questions worth 2 points (6 points total) , each due by 9 am before class. Students will **drop 6 lowest quiz grades.** Given this generous drop policy, make-up quizzes will NOT be given unless you have accommodations. Students are expected to use their grade drops for any quizzes missed.

*The purpose of this assignment is to promote regular study habits, to make sure you are coming prepared for class and rewards consistent active engagement with the material. These practices have been shown to help your overall learning and subsequent grade in the course.*

**Case studies:** There will be ten case study assignments scattered throughout the course, especially in parts two and three and on the last day of class. Each assignment will be worth 10 points. You can drop one lowest score.

*The purpose of this assignment is to review course content and practice application of content to real life examples.*

**Exams:** All exams will feature multiple-choice, short answer and case study questions and will be taken online using the quiz feature on canvas. All exams will be timed and must be taken only on the class day and time as indicated on the schedule. Instructor and TAs will be available during then exam to answer any exam related Qs. The course will have three mid-term exams of 100 points each and students **drop one lowest mid-term grade.** At the end of the course (during Finals week) there will be a **comprehensive final** of 150 points. You **cannot drop the final exam grade.** If you are unable to take a mid-term exam due to extenuating circumstances, you need to use your grade drop. In case of an unexpected serious illness a doctor's note will be required for you to take an exam on another day. Please be aware that make up exams can be harder than regular mid-term exams due to the advantage of knowing the scheduled mid-term

exam content. Students seeking academic accommodations should contact me and make necessary arrangements BEFORE the first exam.

*The purpose of this assignment is to assess student learning and is considered a summative assessment and will thus play a big role in your grade (70%). These exams will test your knowledge/memory of the content and assess ability to apply learned content to real-life scenarios.*

- **Active learning exercises:** Students will participate in learning/review exercises or review case studies. These exercises will require the use of clickers. Participation, not accuracy, is rewarded and clicker participation will be used to record attendance.

*The purpose of this assignment is to assess student learning during class and adjust teaching/explanations according to student needs. It also helps student practice exam-style questions.*

- **Extra Credit Discussion Board:** A Maximum of **10 extra credit points** can be earned in this course via the **Discussion Board**. The objective is to provide a platform for students to voice/share their thoughts and opinions about course related materials. Participation can earn you bonus points in the following ways:

- Posting interesting and relevant articles will earn you 1 point per post but post must include a preamble of your own thoughts regarding the post (30 word minimum).
- Thoughtful comments on posted articles can earn you 1 point (40 word minimum).
- No more than two posts or comments per day per student.
- Board closes for grading at 9am on the last day of class (Dec 7th).

*It is the instructor's discretion to evaluate the thoughtfulness and worth of comments, posts and give points. Posts or Comments that are irrelevant to our course or do not provide any meaningful insight or display any intellectual involvement or thoughtfulness on behalf of the student will not be awarded points.*

*The purpose of extra credit is to reward student engagement and commitment to the course.*

### **Grade Distribution and Calculation:**

- Independent study quizzes (12%) =  $10 \times 6 = 60$  points (6 drops)
  - Case studies (18%) =  $9 \times 10 = 90$  points (1 drop)
  - Mid Term Exams (40%) =  $2 \times 100 = 200$  (1 drop)
  - Final Exam (30%) = 150 points (no drops)
- Total= 500 Points** (Without Extra credit of up to 10 points)

The final grade will be calculated from the total points earned at the end of the semester. After the final exam the final total score will be normalized to the average total score of the top 5% of the class i.e., the average total score of the top 5% of the class will be set to 100% and other scores adjusted accordingly. This policy accommodates for teaching/assessing deficiencies. The total average score includes ALL points but will never be allowed to be higher than the total score without extra credit. You can follow your non-normalized grade on Canvas. So, the final grade in the course that you will get will either be the same as on canvas or slightly higher but never lower. I will message each student their final grade and its calculation before submitting to the registrar. Final normalized grades will be determined using the grading scheme below:

A	100%	to 94%
A-	< 94%	to 88%
B+	< 88%	to 82%
B	< 82%	to 76%
B-	< 76%	to 70%
C+	< 70%	to 66%
C	< 66%	to 60%
D	<60%	to 55%
E	<55%	To 0%

## **Support for Students:**

**A. Online Resources:** All independent study and lecture handouts, lecture slides, case studies, practice exams will be made available on canvas. Zoom recordings of all lectures will also be made available on canvas. Details of where to find all these resources will be shown to you on the first day of class. Before each exam the instructor will post study topics i.e., a list of topics that students need to study before the exam along with a practice exam. All materials for this course are copyrighted. Please do not distribute or share course resources without instructor permission.

**B. Instructor Office Hours:** The needs of my students are my number one priority. Students can set up appointments to meet via zoom or in-person with me. Please freely contact the instructor by email with questions or to set up appointments to meet. Please give the instructor 24 hours to respond to email questions. The instructor will also be available 5 minutes before and after class to answer any quick questions. Do NOT email the instructor via canvas. Email directly at [naina.phadnis@utah.edu](mailto:naina.phadnis@utah.edu). Please put BIOL 3210 in the subject line so I can give preference to your email. Be professional in your communications with me and always sign your name so I know who wrote to me. Before each exam, the instructor will hold a zoom open house for students to ask Qs and review any material they are struggling with.

**C. TA-Study and Review sessions:** This semester I have two highly talented TAs to help you succeed in this course. They should be your first resource to seek help as they understand the course from a student and a teacher's perspective. TAs will hold weekly study sessions. There will be two study sessions almost every week that you can use to review content or ask Qs. Before each exam the TAs will conduct review sessions outside of class time. Attendance to study and review sessions is optional but has been shown to significantly boost student performance in exams. TAs will also be available 10 minutes before class starts to answer any quick questions and you can also email TAs for course support. Timings and dates of study and review sessions will be announced on canvas.

**D. Health and Wellness Accommodations:** Your health and wellness are just as important to me as your learning. I understand that students may have to miss class occasionally or may be impacted by an illness. If you fall sick or are facing a mental health crisis or have personal responsibilities that need your time, please contact the instructor as soon as you can to make accommodations. I will do my best to accommodate your needs. Please know that all class resources will be posted to canvas for you to have access to if you happen to miss class and there are several grade drops included for most assignment groups.

## **Course Policies**

**Attendance & Punctuality:** *First day of this class is Monday August 21st and last day of THIS class is Wednesday December 6.* The University expects regular attendance at all class meetings. Students are expected to acquaint themselves and satisfy the entire range of academic objectives and requirements

as defined by the instructor. Please contact the instructor for any missed quizzes/exams, ideally before the due dates. I will try to do my best to accommodate your requests if it is sincere and feasible.

**Missed exams:** Please note the exam dates in the schedule and on the canvas calendar. Try your best NOT to miss exams. In case of missed exams due to a serious illness a doctor's note will be required. You will be encouraged to use your grade drop for any missed exam.

**Rescoring online exams or quizzes:** If you believe that your score is incorrect, you may submit a request for your quiz or exam to be regraded provided you submit a written explanation of why you think you deserve a regrade and the request is made within 7 days after exam score is released.

**Online Participation:** *Students* are expected to log in and check canvas **every day** for posted announcements and assignments. Students are also strongly advised to set up notifications for canvas, so they do not miss any important notifications.

**Learning Environment:** I am committed to making our classroom, canvas discussions and our interactions as inclusive and respectful as possible. Mutual respect, civility, and the ability to listen to others are crucial to this course. Respectful participation in all aspects of the course will make our time together productive and engaging. Any online activity for this course including ZOOM interactions, discussion threads, emails and canvas are all considered equivalent to the classroom and student behavior within those environments shall conform to the student code. Specifically:

- A. *Posting photos or comments off topic in a classroom are still off-topic on any online platform including social apps like discord. Off color language and photos are NEVER appropriate.*
- B. *Using angry or abusive language is called flaming and is not acceptable and will be dealt with according to the student code.*
- C. *Do not use ALL CAPS in your online course interactions, except for titles since it is an equivalent of shouting online, as is overuse of punctuation marks such as exclamations!!!!!! And question marks?????*
- D. *Course e-mails and other online course communications are part of the classroom and as such are University property and subject to the Student Code. Privacy regarding these communications between correspondents must not be assumed and should be mutually agreed upon in advance, in writing.*

**Use of Electronic Devices and Equipment Failure:** It is your responsibility to maintain your computer, broadband internet access, video camera, laptop, clicker or cell phone equipment in order to participate in the course. *Equipment failures will NOT be an acceptable excuse for absences or missing assignments.* Please do not use your electronic devices during class for non-course related activities because it disrupts your attention and the class. The instructor holds the right to ask you to leave the classroom for such behavior.

**Canvas and Zoom literacy expectations:** Students are expected to be computer literate and Canvas and zoom navigation skills are expected.

**Course Drop Policy:** The drop and withdrawal policy is the same as the University of Utah policy. **August 25** is the last day to drop with no tuition and no notation on the transcript. **September 15** is the last day students can withdraw, but tuition will be assessed. Contact the registrar or see the academic calendar for more information.

**Incompletes:** University policy allows assignment of a grade of incomplete (I) if 20% or less of the course work remains unfinished. I will consider assigning an "incomplete (I)" only under EXCEPTIONAL circumstances unrelated to academic performance, and only if a student is passing the course with a C or better when the "Incomplete" is requested. Then incomplete grade must be requested to be considered.

**Wellness:** I understand that these are unusual and stressful times. Personal concerns such as family illness, financial worries, stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student's ability to succeed and thrive. Your physical and mental wellness is

very important to me. Please seek the necessary help and support for such issues. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. <http://www.wellness.utah.edu> . Current information about the university's response to COVID-19 can be found at: <https://coronavirus.utah.edu/and>: <https://returntocampus.utah.edu/>. In order to help monitor the spread of COVID-19 and respond appropriately, the university requests that faculty, students and staff complete a reporting form if they have received a positive COVID test result. The university will not release personal information collected from this form.

**Academic misconduct:** Although I acknowledge that due extenuating life circumstances you may face temptations and stresses, but cheating is never the solution. I will do my best to reduce such stresses and temptations, but they also cannot be completely avoided. Your instructors and TAs are available to help you through this time and you should reach out for course support. I want you to understand that **cheating is not a victimless crime, and it results in severe inequities for other students at our university**. All suspected cases of academic misconduct including consulting others during an online exam, looking up answers on disallowed resources, using someone else's clickers, cheating, and plagiarizing will be dealt with according to rules in the student code, University policy 6-400(V). By accepting admission to the University, you have agreed to abide by the University rules provided to you in the student handbook. Take note of B 2 a, b, and c. Cheating and plagiarism are serious offenses and can result in getting a zero on the assignment, failing a class, a note in your record or being expelled. Here is the link <http://www.admin.utah.edu/ppmanual/8/8-10.html>. *ALL cases of academic misconduct will be dealt with seriously and reported to the college. You will also be signing a code of conduct for each exam. "Be the change you want to see in this world".*

**Compliance with ADA Regulations:** The University of Utah seeks to provide equal access to its programs, services, and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, Phone (Voice/TDD): (801) 581-5020, email: [info@disability.utah.edu](mailto:info@disability.utah.edu). CDS will work with you and the instructor to plan for accommodations. All written information in this course can be made available in alternative format with prior notification to the Center for Disability Services. If you would like to request academic accommodations due to a disability, please contact Disabled Student Services. **If you have a letter from Disabled Student Services indicating you have a disability that requires academic accommodations, please present the letter to me so we can discuss the accommodations you might need for class.** As soon as you make me aware of your needs, I can work with you and the Center for Disability Services to help determine appropriate accommodations. I will treat any information about your disability with the utmost discretion. Your success in this class is important to me. We can work together to meet both your needs and the needs of this course.

**Accommodations Policy:** I do not grant content pedagogical accommodation requests as the course content fulfills legitimate pedagogical goals.

**Discrimination and Harassment policies:** I have zero tolerance for any discriminatory or harassing behavior. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or Office of the Dean of Students, 270 Union Building, 801-581-7066. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS). Please see Student Bill of Rights, section E <http://regulations.utah.edu/academics/6-400.php>

**Safety Policy:** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. For more information regarding safety and to view available training resources, including helpful videos, visit [safeu.utah.edu](http://safeu.utah.edu)

**Addressing Sexual Misconduct:** Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense



subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status, or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

**Diversity / Inclusivity Statement:** It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In addition, if any of our class meetings conflict with your religious events, please let me know so that we can make arrangements for you.

**Names/Pronouns:** Class rosters are provided to the instructor with the student's legal name as well as "Preferred first name" (if previously entered by you in the Student Profile section of your CIS account, which managed can be managed at any time). While CIS refers to this as merely a preference, I will honor you by referring to you with the name and pronoun that feels best for you in class or on assignments. Please advise me of any name or pronoun changes so I can help create a learning environment in which you, your name, and your pronoun are respected. If my TAs or I are mispronouncing your name or not using the correct pronoun, please let us know. It is very important to me that all my students feel included and comfortable in this course.

**Veterans Center:** If you are a student veteran, the U of Utah has a Veterans Support Center located in Room 161 in the Olpin Union Building. Hours: M-F 8-5pm. Please visit their website for more information about what support they offer, a list of ongoing events and links to outside resources: <http://veteranscenter.utah.edu/>. Please also let me know if you need any additional support in this class for any reason.

**English Language Learners:** If you are an English language learner, please be aware of several resources on campus that will support you with your language and writing development. These resources include: the Writing Center (<http://writingcenter.utah.edu/>); the Writing Program (<http://writing-program.utah.edu/>); the English Language Institute (<http://continue.utah.edu/eli/>). Please let me know if there is any additional support you would like to discuss for this class.

## Expected Learning Outcomes

### **Broad objectives for core concepts in Biology**

**Structure and function:** Students will be able to use knowledge of molecular, cellular, and organismal structures of microbial pathogens to explain the pathogenesis of infectious diseases.

**Systems:** Students will be able to understand how microbes interact with their environment and to give rise to emergent properties at multiple levels of biological organization. Students will be able appreciate the remarkable diversity of individual microorganisms and the complex partnerships of microbes with other organisms and the environment.

**Ability to participate in the interdisciplinary nature of science:** Students will be able to apply concepts and sub-disciplinary knowledge in physiology, anatomy, chemistry, epidemiology, and medicine in order to diagnose and explain the pathogenesis of infectious diseases.

**Ability to explain the relationship between science and society:** Students will be able to

evaluate the societal impacts of infectious diseases, prevention programs and microbiological research.

**At the end of this course students should be able to.....**

- Identify members of the microbial world based on structural and functional features.
- Appreciate that majority of microbes are vital, useful, or harmless but the few that do cause disease have a huge impact.
- Provide examples of partnerships of microbes with various organisms and explain the impact of these interactions.
- Connect ideas about microbial structure, function, gene expression and metabolism to the pathogenesis of microbial diseases.
- Outline and describe various components of the human immune system and explain how all components work together to combat infectious microbes.
- Explain the underlying biological concepts behind the diagnostic tools used for infectious disease diagnosis.
- Summarize the science behind the use of vaccines and antimicrobials and appreciate the impact of both on human health.
- Explain with examples the reasons leading to the rise of preventable and/or curable diseases.
- Identify key pathogenesis features of the discussed pathogens.
- Compare the mechanisms of pathogenesis of various infectious diseases.
- Relate pathogenesis to disease symptoms, treatment, and prevention.
- Use microbial nomenclature and specific medical terminologies.
- Appreciate the importance of an educated public to combat and control infectious disease.
- Read articles about infectious diseases in books and online media and be able to discern dubious news from scientifically sound claims using scientific reasoning.
- Apply course concepts to understand disease patterns in their own community.
- Analyze data from research papers on the topics discussed and understand key findings.