

BIOL220 – Spring 2018
2 credits
The University of Tennessee

Lecture: Wednesdays and Fridays 11:15 am-12:05 pm, Dabney-Buehler 415
Instructor: Dr. Jeremiah Johnson (jjohn358@utk.edu)
Office Hours (location): **Mondays, 11:15-12:05 pm, Dabney-Buehler 415**
Thursdays, 9:00 am-10:00 am, Walters Life Sciences, F419
Other meetings by appointment

Course Description: Fundamental concepts in microbiology: structure and function of microbial cells; roles of microbes in nature and society; microbial diseases and immunity.

BIOL220 is an introductory survey course in microbiology. It will cover a wide number of topics so students can gain an understanding and appreciation for the many sub-disciplines that comprise the field. The first part of the course will cover basic foundational concepts such as the structure, physiology, and metabolism of microorganisms. In the second part of the course, we will discuss the diverse microorganisms that exist in the environment, how they impact the availability of vital nutrients, and how they shape the global climate. In the third and final part of the course, we will gain a basic understanding of the immune system, how microorganisms can cause disease, and what humans do to combat it.

Course Learning Objectives

By the end of this course, the student will be able to:

- Explain the relationships between the structure of a microbial cell and its functional components, as well as the basics of microbial metabolism and the regulation of gene expression.
- Discuss the relevance of genetic exchange among microorganisms for adaptation and evolution.
- Recognize different groups of microorganisms and distinguish microorganisms based on their lifestyles.
- Outline physical and chemical methods that are used to control the growth of microorganisms.
- Gain an appreciation for nonspecific as well as specific body defense mechanisms and how these defenses work to help prevent infection.
- Explain the role of microorganisms in biogeochemical cycling of the major elements on Earth.
- Outline approaches to study microbial community structure and function.
- Formulate principles and practices that are employed in the field of epidemiology to protect populations.

Biology Degree Learning Objectives

This course satisfies a requirement within the Biological Sciences degree curriculum. As such, we will strive to cover the **five big ideas (FBIs)** in biology as they relate to microbiology.

1. **Evolution:** Populations of organisms and their cellular components have changed over time through both selective and non-selective evolutionary processes.
2. **Structure and Function:** All living systems (organisms, ecosystems, etc.) are made of structural components whose arrangement determines the function of the systems.
3. **Information Flow and Storage:** Information (DNA, for example) and signals are used and exchanged within and among organisms to direct their functioning.
4. **Transformations of Energy and Matter:** All living things acquire, use, and release and cycle matter and energy for cellular / organismal functioning.
5. **Systems:** Living systems are interconnected, and they interact and influence each other on multiple levels.

How you will learn the material to be successful in this course

As this is a lecture-dependent course, it is vital that you take notes about what is discussed in class; you would not do well in this course by simply reading the course materials on Canvas and skipping the lectures. To promote lecture attendance and note taking, I will NOT post lectures to Canvas until the Friday before an exam. As such, I recommend that you attend every lecture! Research also shows that

you should write out notes by hand; writing by hand makes far more neuronal connections than typing and that will help you comprehend the material. To promote this and encourage an undistracted classroom, I prohibit the use of any electronics (computer, phones, tablets, etc.) during class. You just need yourself, a notebook, and a writing utensil.

To help your note taking, I strongly suggest that you re-write and re-organize your notes (BY HAND) after every class meeting. Do your notes make sense? If not, come to office hours or schedule an appointment. If you do not understand something, ASK! Ask questions in class or come to office hours/schedule meetings with me to go over material.

Date	Day	Chapter	Topic
1/10	Wed	1	Course Overview – Microbial Life
1/12	Fri	2	Observing the Microbial Cell
1/17	Wed	3	Microbial Cell Structure & Function
1/19	Fri	4	Nutrition, Growth, and Development
1/24	Wed	5	Environmental Factors and Microbial Control, Deadline to Drop Without a W
1/26	Fri	7	Genome and Chromosome
1/31	Wed	8	Genes, RNA, and Proteins
2/2	Fri	10	Molecular Regulation in Cells
2/7	Wed	6	Virus Structure and Function
2/9	Fri		Discussion I
2/14	Wed		Exam I
2/16	Fri	13	Energetics and Catabolism
2/21	Wed	13-14	Catabolism and Respiration
2/23	Fri	14	Respiration, Lithotrophy and Photosynthesis
2/28	Wed	15	Biosynthesis
3/2	Fri	16	Food and Industrial Microbiology
3/7	Wed	17	Origins and Evolution
3/9	Fri	18-20	Microbial Diversity
3/12 – 3/16	Mon-Fri		Spring Break
3/21	Wed	21	Microbial Habitats and Communities
3/23	Fri		Discussion II
3/28	Wed		Exam II
3/30	Fri		Spring Recess
4/3	Tue		Deadline to Drop with a W
4/4	Wed	22	Microbes and the Global Environment
4/6	Fri	23	The Innate Immune Response
4/11	Wed	24	The Adaptive Immune Response
4/13	Fri	25	Microbial Pathogenesis
4/18	Wed	26	Microbial Diseases
4/20	Fri	27	Antimicrobial Chemotherapy and Resistance
4/25	Wed	28	Clinical Microbiology and Public Health
4/27	Fri		Discussion III
5/3	Thu		FINAL EXAM: 10:15 am – 12:15 pm

As per the registrar's website: "Final exams must be given during the final exam period at the scheduled time, although alternative uses of the scheduled exam period may be designated by the instructor. Students are not required to take more than two written exams on any day. The instructor(s) of the last non-departmental exam(s) on that day must reschedule the student's exam during the exam period. **It is the obligation of students with such conflicts to make appropriate arrangements with the instructor at least two weeks prior to the end of classes.**"

Changes to the syllabus

The instructor has the right to revise/alter any part of the syllabus. If any changes occur, students will be notified immediately via Canvas, group email, and/or in-class announcements.

Technology: During exams, any electronic device seen on your desk or within sight will result in a grade of zero.

Honors-by-Contract: Any student interested in taking this course via honors-by-contract should contact me for detailed information on the additional requirements.

Support for learning

REQUIRED Texts and Materials:

Microbiology: An Evolving Science, 4th^d ed. Slonczewski JL, Foster JW. W. W. Norton & Co.

The Hardcopy version of this textbook is available from the UT Bookstore. Electronic versions are available from the publisher's website at reduced cost. Please refer to publisher's website for specific information on available formats and cost structure (<http://www.nortonebooks.com/>).

Course website: Go to "Online@UT" to login to CANVAS. This site will be used regularly for communication and posting lecture syllabus, extra readings, assignments, course grades, etc.

Communications:

- You need to regularly check your UTK e-mail account for announcements related to this course.
- Email is an excellent way to communicate with me.
- All emails to me must have "BIOL220" in the subject line.
- If you need to meet and cannot make office hours, please e-mail me to schedule.

Study Rooms:

- Monday review sessions in Buehler are a convenient place to study (and I am there!).
- 417 Hesler is a quiet study room for majors in Biology. It can also be reserved for group study.
- There is also a student study room in Neyland Biology Annex, room 103.

Assessment of your learning

Class attendance:

- **Students must attend at LEAST 50% of the lectures or they will receive an F for the course.**
- There are a total of 28 lectures; students must attend a minimum of 14 lectures, or he/she will receive an F for the course.
- Class attendance will be monitored through classroom sign-in sheets.

Grades:

- 2 exams, 100 points each (details below).
- 1 final exam, 150 points (details below).
- 3 discussion session write-ups, 25 points each (details below).
- 1 research seminar write-up, 25 points (details below).
- Total points: 450 points.
- **Note that no individual extra credit will be given for this course.**

Exams:

- There will be two, in-class, closed-book examinations, each totaling 100 points. The exams will

consist of 70% multiple choice, 10% fill-in the blank, and 20% short “thought” questions. The use of review sheets and electronic devices (cell phones, PDA’s, etc.) are strictly prohibited during exams and must be stowed out of sight during the entire exam period.

- The Final Exam will be formatted similar to the other exams, but will be cumulative and total 150 points; however, the focus will be on the material from the third part of the course.
- Exam questions will be based on the materials discussed in class, provided in the pertinent textbook chapters, and all assigned readings.
- **Cheating on exams, quizzes, or homework assignments will not be tolerated. Improper conduct will automatically result in a grade “zero” for the exam, quiz or assignment. A second incident of improper conduct will result in the grade “F” for the entire class and referral to the Office of Student Judicial Affairs.**
- All exam questions and answer sheets will be collected by the instructor for individual student course documentation.
- Exam scores will be posted at the class website on Canvas at Online@UT. The first two exams will be given during the regular class period while the fourth exam will be given as your final on **May 3 from 10:15 am – 12:15 pm.**
- Computation of a student’s final class grade is based on the total number of points from the three exams and additional assignments (450 points possible).

Discussion Sessions:

- One week prior to a discussion session, I will send five topics/questions from the preceding lectures that warrant more or deeper contemplation. For each topic, you will be required to independently generate five responses to each topic/question with each response being worth 1 point (5 topics x 5 responses = 25 points).
- We will split into groups during the scheduled discussion session and you will discuss your responses within your group for 20 min. After, we will reconvene as a class and discuss your group’s responses for the remainder of the class period (30 min.).
- Prior to adjourning for the day, you will turn in your individual typed responses, so they can be examined and you can receive credit.

Research seminar write-up:

- Once during the course of the semester, students will need to attend one microbiology seminar and provide a one-page write-up. The write-up should contain three subjects: 1. A summary of the talk, 2. Three things you learned from the talk, and 3. Two things that you would have liked to have seen addressed.
- Schedules:
- Micro - <https://micro.utk.edu/seminars/index.php>,
- BCMB - <http://bcmb.utk.edu/wp-content/uploads/2018/01/2018-Spring-Seminar-Schedule.pdf>

Grading Questions, Concerns, Comments

Questions regarding ANY grade in this course (whether quiz or test) will be handled ONLY via an in-person meeting. Grading issues will not be handled via email or phone. If you have a question/concern/comment, you must either come to office hours or schedule an appointment to discuss the issue face-to-face with the instructor.

Missing an Exam and Making up a Missed Exam:

- **Illness or Emergency:** If you have an emergency or illness on the exam day, you should notify the instructor by phone or email no later than the day of the exam. *Failure to contact the instructor within 24 hours of the missed regularly scheduled exam will result in an assigned grade of zero for this exam* (unless there are extreme extenuating circumstances, such as hospitalization or death in your immediate family).
- It is your responsibility to make every effort to take each exam at its regularly scheduled time. Only students with valid, **documented** excuses will be allowed to take a make-up exam and this will be done at the instructor’s discretion within one week of the regularly scheduled exam that the student has missed.

- It is the student's responsibility to notify the instructor that they have missed an exam so appropriate steps may be taken for a make-up exam if appropriate.
- If you anticipate missing an exam date due to a UT sanctioned event or scheduled interviews with professional schools, you need to notify the instructor at least one week prior to the exam so that a make-up exam can be scheduled.
- ***Make up or early exams will consist of short answer and/or essay questions.***
- Excused absences from an exam include: severe personal illness, a death in the immediate family, jury duty, car accident or personal injury, military service or a UT sanctioned event for which UT personnel have requested in writing that the student be absent from the classroom on the scheduled exam day. **Verifiable documentation (i.e. note from a physician, etc.) will be required.**
- There will be no opportunity to make up a missed clicker quiz.

Guidelines to determine your overall final grade in the course:

Final class average based on 450 points Total your points, divide by 450, then multiply by 100	Grade assigned and turned in to the Registrar will be:
Greater than or equal to 92	A
89-91	A-
86-88	B+
82-85	B
79-81	B-
76-78	C+
71-75	C
68-70	C-
60-67	D
Below 60	F

Academic integrity:

Academic dishonesty of any sort will not be tolerated. Plagiarism includes the copying of phrases, portions of sentences or the main ideas from ANYONE (including a classmate) on ANY work submitted for a grade (exams, assignments, quizzes, etc). Academic dishonesty also includes assisting other students on quizzes or exams.

You are expected to abide by The University of Tennessee honor statement in Biology and in all of your university activities as pledged in the honor statement that each student agrees to when applying to the University:

“As a student of the University, I pledge that I will neither knowingly give nor receive any inappropriate assistance in academic work, thus affirming my own personal commitment to honor and integrity.” (University of Tennessee Student Code of Conduct)

Depending on the offense, penalties for academic dishonesty range from a minimum of a zero for the assignment, to an F for the course, to the filing of formal academic dishonesty charges seeking dismissal from The University of Tennessee. These choices are at the discretion of the instructor.

You should be familiar with the requisites of academic honesty and what constitutes academic dishonesty as outlined in the UT's Hilltopics (hilltopics.utk.edu).

Other information

Disability Services: It is the responsibility of the student to bring the instructor all appropriate disability forms for signature no later than one week prior to an exam if you desire to take your exam outside of the classroom at a UT Approved Disability Center. This will ensure that the exam is hand-delivered to the UT

approved test site in a timely fashion. If you need course adaptations or accommodations because of a documented disability, please contact me privately to discuss your needs. If you have questions or concerns about disabilities or emergency information to share, please contact Disability Services: 2227 Dunford Hall; 974-6807; Email: ods@utk.edu; Website: <http://ods.utk.edu/>).

Academic Assistance:

Tutoring: The Division of Biology does not offer tutoring services. Contact the Student Success Center and the Academic Support Unit of The Office of Minority Student Affairs for information about tutoring opportunities.

- **Student Success Center:** The comprehensive source for information, services, and resources to assist your success at UT: <http://studentsuccess.utk.edu>
 - 812 Volunteer Boulevard, Greve Hall, room 324
 - 865 974-6641, Email: studentsuccess@utk.edu

Technical Assistance:

Blackboard, clickers, or general information technology assistance:

- Help Desk: 865 974 9900 (M – F, 8:00 – 5:00)
- OIT Walk-In Help Desk: Commons, 2nd floor Hodges Library
- Turning Technologies (clickers): 866 746 3015

Counseling Center: <http://counselingcenter.utk.edu/>

1800 Volunteer Boulevard

865 974-2196, Email: counselingcenter@utk.edu

OTHER RESOURCES FOR STUDENTS:

- One Stop: <http://onestop.utk.edu> (start here for any question you have)
- Undergraduate Catalogs: <http://catalog.utk.edu> (Listing of academic programs, courses, and policies)
- Hilltopics: <http://dos.utk.edu/hilltopics> (Campus and academic policies, procedures and standards of conduct)
- Course Timetable: https://bannersb.utk.edu/kbanpr/bwckschd.p_disp_dyn_sched (Schedule of classes)
- Academic Planning: <http://www.utk.edu/advising> (Advising resources, course requirements, and major guides)
- Library: <http://www.lib.utk.edu> (Access to library resources, databases, course reserves, and services)
- Career Services: <http://career.utk.edu> (Career counseling and resources; HIRE-A-VOL job search system)

Classroom etiquette

Please turn off your cell phones when in class. Also, be respectful of others and do not distract those around you.

Additional tips for success

- **Be present** – attend all your classes– every activity in a class was included intentionally to help you learn and is therefore an important part of success in the class!
- **Be a participant** – engage in class, work with your peers to understand material, take notes in class, ask questions
- **Be perceptive** – your instructor provides clues to success via the content they focus on, activities they have you do, hints they drop in class, and the way they test. Use these cues to be successful in THAT class (which may be different from how to be successful in another class!)
- **Be prepared** – do your homework, take notes on readings (not just highlight them), try to understand things before you go into lecture class
- **Be proactive** – go to office hours, stick to a regular weekly or daily study schedule (don't cram), form a study group (THAT STUDIES!)
- **Be purposeful** – remember your goals for attending college, make adjustments when things don't go right and don't give up