

LECTURE SYLLABUS - MICROBIOLOGY, BIOL 4300-001: Spring 2025, Tue/Thu 8:00 AM – 9:20 AM

Instructor: Riqing Yu, Ph.D. (ryu@uttyler.edu)
Associate Professor, Department of Biology
Office: HPR 105; Tel: (903) 566-7257

Office Time: Mon/Wed 4:00-5:00 pm, Thu 9:30-10:30 am

Lecture (Time & location): Tue/Thu 8:00 AM-9:20 AM; **Classroom:** HPR Bldg Room 00253.
Instruction Mode: Face to Face.

Required Textbook: Willey, Sandman, and Wood: Prescott's Microbiology, 12th ed. McGraw-Hill, 2023 (ISBN10: 1264088396). All reading assignments are from this book.

Course Description: Microbiology is an upper-level course, aimed at juniors and seniors who want to expand their knowledge of the prokaryotic and eukaryotic microbes and viruses, microbial metabolism and genetics, phylogenetic evolution and microbiome, and microbial interactions with environments and human. It is also an essential course for students to enroll in medical or graduate schools.

The major topics are microbial cell structure and function, microbial metabolism and growth, genetics and metabolic regulation, diversity and evolution, metagenomic and community analysis, nutrient cycling and bioremediation, human microbiome and diseases, and microorganisms in industry, clinic and food science. Students will be expected to understand and appreciate the unique nature of microorganisms and their importance to life in both beneficial and harmful aspects, and be able to use them in class, in the laboratory, and in exams.

Objectives: This course will lead you to learn the fundamental scientific concepts and basic skills of applied and research microbiology for junior and senior undergraduate students. Specifically, we will assess the ways in which human activities and environments impact microbial systems and vice versa. Special consideration will be given to microbial molecular biology and genetics, microbiome characterization, analyses of microbial metabolisms and their regulation, human microbiome and diseases, and functioning genes and species in a variety of natural and engineered systems.

Prerequisites: Prior exposure to General Biology and Lab I (1106) and II (1107) and Organic Chemistry I is required.

Artificial intelligence language use in BIOL 4300: During some class assignments, we may leverage AI tools to support your learning, allow you to explore how AI tools can be used, and/or better understand their benefits and limitations. Learning how to use AI is an emerging skill, and we will work through the limitations of these evolving systems together. However, AI will be limited to assignments where AI is a critical component of the learning activity. The TA and I will indicate when and where the use of AI tools for the course assignments is appropriate.

Academic Integrity: Students are reminded of their pledge to uphold the University of Texas at Tyler Honor Code. Please refer to <http://www.uttyler.edu/educpsych/files/HonorCode.pdf> for guidelines covering academic fraud as they may apply to the course assignments and exams.

Canvas: All course PPT slides, announcements, assignments and grades will be posted online using Canvas (<http://www.uttyler.edu/canvas/index.php>). Updates to this syllabus will be posted; please check periodically. Homework assignments will be forwarded to students via Canvas and completed assignments should be submitted online on Canvas. Please refer to the “assignments” section on Canvas for detailed instructions on how to view and submit homework assignments. Letter grades which are combined from all grades will not be assigned until the end of the semester.

Grading: Each exam or assignment will be 100 points based. Final grade scale will be calculated as follows. Your overall letter grade will be rounded up one level if your grade is only within 1 point lower than the grade scale. All exams and their questions are forbidden for photoing or copying, and the instructors and the university own the copyright of the course exams.

Assignments	% of Final Scores
Midterm 1	20%
Midterm 2	20%
Class attendance & participation	5%
Paper presentation	15%
Midterm 3	20%
Final (Midterm 4)	20%

Final grade scale				
A: 90-100%	B: 80-89%	C: 70-79%	D: 60-69%	F: <59%

Makeup Tests and Attendance: In the case of illness, sports competitions or other excused absences, you will be only given one chance of makeup exam if you notify the professor before the exam. You must have a note from your physician, a coach or whoever is appropriate for explaining a legitimate absence. If you are not excused, you will receive a zero. No one may take the final exam early.

Attendance: Attendance is required for the active and interactive study and to follow the teaching procedures for all students, which also involves the viewing of course recordings and materials as necessary. Answering quizzes, completing homework, and/or submitting comments in discussions are also indispensable parts so that I can note attendance in class. The instructor is also required to provide attendance data for Financial Aid, midterm, and final grades submissions; therefore, it is critical that you maintain activity in this class. Attendance: The instructor will randomly check the class attendance around 15 times to evaluate the attendance grade based on the percentage the student shows up.

Presentation assignment: Every 2-3 students (required 2-3 students to fit the two presentation classes’ session) as a group will have **12 minutes** to present **one microbiology-related research paper**, including introduction, hypothesis, material and methods, results, discussion or conclusions.

By choosing any *microbe-related topic* you are interesting in (not animal cells or cancer cells), you could search the proper papers by Pubmed (<http://www.ncbi.nlm.nih.gov/pubmed>) or other database source online. Once browsing the abstracts of papers, you will further determine

one paper you really want to present (you may use another review paper on the same topic for your PPT introduction). Then you could download the paper either directly from Pubmed if it is available, or you could find the full papers on the e-journals in UT Tyler library (<https://sfx-01uotat.hosted.exlibrisgroup.com/uttyler/journalsearch>). If you present a no-microbe related topic, you may accept a lower evaluation score.

Final presentation grades will be evaluated by the instructor and all your classmates with a full grade of 100 points. The evaluation criteria include a reasonable and clear introduction and hypothesis, understandable methods, supportable results and conclusions with efficient communication (see the posted presentation evaluation criterion).

ProctorU: ProctorU Auto is an online proctoring service that allows you to take your exam from the comfort of your home. ProctorU's automated service is available 24/7 and does not require scheduling. Beyond the cost of the initial equipment needed (e.g. a camera for your computer), there is not any additional cost for proctoring. You will need to create a ProctorU account and install the ProctorU extension before attempting any assessment. To create a ProctorU account, follow the ProctorU tool within Canvas (See <https://www.youtube.com/watch?v=u8o9SA75ZVI&feature=youtu.be>). Please make sure you are using the current version of Chrome or Firefox, and download the ProctorU extension available at <http://bit.ly/proctoruchrome> for Chrome or <https://www.proctoru.com/> for Firefox.

Your enrollment in this course requires the use of ProctorU for online assessment proctoring. YOUR ACTIVITIES ARE RECORDED WHILE YOU ARE LOGGED INTO OR TAKING YOUR ASSESSMENT(S). The recording serves as a proctor and will be reviewed and used in an effort to maintain academic integrity. You can find more detailed information on ProctorU at <https://www.uttyler.edu/digital-learning/proctoru-resources>. If you have religious or other concerns about this methodology, please contact the SAR office.

In order to use ProctorU, you will need the following: High-speed Internet connection, Webcam (internal or external), Windows, Mac, or Chrome Operating System, Up-to-date Chrome or Firefox browser and ProctorU extension installed, Valid photo ID, Quiet environment to take your assessment. You can visit the Test Taker Resource Page for additional information at <https://bit.ly/ProctorMe>. Please familiarize yourself with the tool before the first quiz.

Type	Minimum	Recommended
Web Camera	640×480 resolution	1280×720 resolution
PC Users	Windows Vista	Windows 10 (10 S is not supported)
Mac Users	OS X 10.5 or higher	OS X 10.13 High Sierra
Internet Download Speed	.768 Mbps	1.5 Mbps
Internet Upload Speed	.384 Mbps	1 Mbps
RAM	1024 MB	2 GB
Ports	1935, 843, 80, 443, 61613, UDP/TCP	1935, 843, 80, 443, 61613, UDP/TCP

Disability/Accessibility Services: In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA), the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including non-visible a diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The **Student Accessibility and Resources (SAR)** office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150, or call 903.566.7079.

Important health Information of UT Tyler for Classrooms and Laboratories: Students who are feeling ill or experiencing symptoms such as sneezing, coughing, or a higher-than-normal temperature will be excused from the class or laboratory and should stay at home and may join the course or lab remotely by Zoom. Students needing additional accommodations may contact the Office of Student Accessibility and Resources at University Center 3150, or call (903) 566-7079 or email saroffice@uttyler.edu.

Privacy: Students do not have the right to be “anonymous” whether classes are in person or online, or for online courses. All discussion pages will take place within Canvas, and your names will be displayed.

Recording of Class Sessions: Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

Course Schedule¹

	Date	Topic	Cover & Reading
			Total 80 min/class
	Thu	Jan 16	Evolution of Microorganisms and Microbiology
	Tue	Jan 21	Bacterial, Archaeal and Eukaryotic Cell Structure
	Thu	Jan 23	Viruses and Other Acellular Infectious Agents
	Tue	Jan 28	Viruses and Other Acellular Infectious Agents
	Thu	Jan 30	Microbial Growth
	Tue	Feb 04	Antimicrobial Chemotherapy (Review)
	Thu	Feb 06	Midterm Exam #1 (Ch 1, 3, 4, 5, 6, 7, 9)
	Tue	Feb 11	Introduction to Metabolism
	Thu	Feb 13	Catabolism: Energy Release and Conservation
	Tue	Feb 18	Anabolism: The Use of Energy in Biosynthesis
	Thu	Feb 20	Bacterial Genome Replication and Expression
	Tue	Feb 25	Bacterial Genome Replication and Expression (Review)
	Thu	Feb 27	Paper presentation 1
	Tue	Mar 04	Midterm Exam #2 (Ch 10-13)
	Thu	Mar 06	Mechanisms of Genetic Variation
	Tue	Mar 11	Mechanisms of Genetic Variation
	Thu	Mar 13	Recombinant DNA Technology
	Tue	Mar 18	Spring break
	Thu	Mar 20	Spring break
	Tue	Mar 25	Microbial Genomics
	Thu	Mar 27	Microbial Genomics (Review)
	Tue	Apr 01	Paper presentation 2
	Thu	Apr 03	Midterm #3 (Ch 16, 17, 18)
	Tue	Apr 08	Microbial Taxonomy and the Evolution of Diversity
	Thu	Apr 10	The Proteobacteria
	Tue	Apr 15	Biogeochemical Cycling and Global Climate Change
	Thu	Apr 17	Human Diseases Caused by Viruses and Prions
	Tue	Apr 22	Human Diseases Caused by Bacteria
	Thu	Apr 24	Human Diseases Caused by Bacteria
	Tue	Apr 29	Study Day
	Thu	May 01	Final Exam (Ch 19, 22, 28, 38, 39) (8-10 am, May 01)

¹Schedule is subject to change. BIOL 4300 Microbiology Lecture: Permission #-contact dept. secretary.