LECTURE SYLLABUS - MICROBIOLOGY, BIOL 4300-001
Fall 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:** Cowan Fine Arts Ctr Rm 01009. **Instruction Mode:** Face to Face.

Required textbook: Willey, Sandman, and Wood: Prescott's Microbiology, 11th or 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 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. **Any cheating or other types of academic misconduct will be reported to the university administration and at minimum will result in failure of this course**.

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 copy right 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 for 10-15 times to evaluate the attendance grade based on the percentage the student shows up.

Presentation assignment: Every **3-4** students (required 3 or more students to fit the three classes' session) as a group will have ~**10 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 interested 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 UTTyler library (https://sfx-01uotat.hosted.exlibrisgroup.com/uttyler/journalsearch).

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 is only serving as the backup option for taking exams. 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 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 infectious disease information of UT Tyler for classrooms and laboratories: It is important to take the necessary precautions to ensure a healthy and successful year. UT Tyler continues to urge you to protect yourselves against the flu, COVID and any new threats that may be developing. Be diligent about preventive measures such as washing hands, covering sneezes/coughs, social distancing and vaccinations, which have proven to be successful in slowing the spread of viruses. Encourage those who don't feel well to stay home, and if they show symptoms, ask them to get tested for the flu or COVID. Self-isolation is important to reduce exposure (CDC quarantine/isolation guidelines). Please work with your faculty members to maintain coursework and please consult existing campus resources for support.

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 who have difficulty adhering to the Covid-19 safety policies for health reasons are also encouraged to join the class or lab remotely. 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.

Course Schedule

		Date	Topic		Cover & Reading
		Mon	Aug 25		Total 80 min/class
		Tue	Aug 26	The Evolution of Microorganisms and Microbiology	Ch 1, 3
		Thu	Aug 28	Bacterial, Archaeal and Eukaryotic Cell Structure	Ch 3-5
		Tue	Sept 02	Viruses and Other Acellular Infectious Agents	Ch 4-5, 6
		Thu	Sept 04	Viruses and Other Acellular Infectious Agents	Ch 6, 7
		Tue	Sept 09	Microbial and Archaeal Growth	Ch 7
		Thu	Sept 11	Antimicrobial Chemotherapy (Review)	Ch 9
		Tue	Sept 16	**Midterm Exam #1** (Ch 1, 3, 4, 5, 6, 7, 9)	
		Thu	Sept 18	Introduction to Metabolism	Ch 10
		Tue	Sept 23	Catabolism: Energy Release and Conservation	Ch 11
		Thu	Sept 25	Anabolism: The Use of Energy in Biosynthesis	Ch 11, 12
		Tue	Sept 30	Bacterial Genome Replication and Expression	Ch 13
		Thu	Oct 02	Bacterial Genome Replication and Expression (Review)	Ch 13
		Tue	Oct 07	Paper presentation 1	
		Thu	Oct 09	**Midterm Exam #2** (Ch 10-13)	
		Tue	Oct 14	Mechanisms of Genetic Variation	Ch 16
		Thu	Oct 16	Mechanisms of Genetic Variation	Ch 16
		Tue	Oct 21	Microbial DNA Technologies	Ch 17
		Thu	Oct 23	Microbial Genomics	Ch 18
		Tue	Oct 28	Microbial Genomics (Review)	Ch 18
		Thu	Oct 30	Paper presentation 2	
		Tue	Nov 04	**Midterm Exam #3** (Ch 16, 17, 18)	
		Thu	Nov 06	Microbial Taxonomy and the Evolution of Diversity	Ch 19 (11th ed)
		Tue	Nov 11	Proteobacteria	Ch 21
		Thu	Nov 13	Biogeochemical Cycling and Global Climate Change	Ch 21, 28
		Tue	Nov 18	Paper presentation 3	
		Thu	Nov 20	Human Diseases Caused by Viruses and Prions	Ch 37
		Tue	Nov 25	Thanksgiving holidays	
		Thu	Nov 27	Thanksgiving holidays	
		Tue	Dec 02	Human Diseases Caused by Bacteria	Ch 37, 38
		Thu	Dec 04	Human Diseases Caused by Bacteria	Ch 38
		Tue	Dec 09	Study Day	
		Thu	Dec 11	**Final Exam** (Ch 19, 21, 28, 37, 38) (8-10 am on Dec. 11)	

[1]Schedule is subject to change. BIOL 4300 Microbiology Lecture : Permission #-contact Rosa Carrillo.