LECTURE SYLLABUS - MICROBIOLOGY, BIOL 4300-001
Spring 2026, Tue/Thu 8:00 AM – 9:20 AM

Instructor: Riqing Yu, Ph.D. (ryu@uttyler.edu)
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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:** Soules Coll of Business 00203. **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. The e-book is available in the UT Tyler library (https://libguides.uttyler.edu/c.php?g=883817&p=10342100).

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 the assignment of review paper writing. 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 graded on a 100-point scale. Final grades will be calculated according to the grading scale below. If your overall score is within one point below a higher letter grade, it will be rounded up to that grade. Photographing or copying exams or exam questions is strictly prohibited. All course exams are copyrighted and remain the property of the instructors and the university.

Assignments	**% of Final Scores**
Midterm 1	19%
Midterm 2	19%
Class attendance & participation	9%
Paper presentation	15%
Midterm 3	19%
Final (Midterm 4)	19%

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

Makeup tests and attendance: In cases of illness, athletic competitions, or other approved absences, students may be granted one opportunity to take a makeup exam, provided the instructor is notified before the scheduled exam. Appropriate documentation (e.g., a note from a physician, coach, or other relevant authority) is required to verify a legitimate absence. Unexcused absences will result in a score of zero. Early administration of the final exam is not permitted.

Attendance: Regular attendance is required to support active and interactive learning and to ensure students follow all instructional procedures. Attendance includes viewing course recordings and materials, completing quizzes and homework, and participating in discussions as assigned. These activities are essential for documenting class attendance.

The instructor is required to report attendance for Financial Aid purposes as well as midterm and final grade submissions; therefore, consistent participation in this course is critical. Attendance will be assessed through 15-20 random checks during the term, and the attendance grade will be based on the percentage of times a student is present and actively participating.

Presentation assignment: Every 3-5 students as a group will have 10-12 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 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).

Disability/accessibility services: In compliance with Section 504 of the Rehabilitation Act, the Americans with Disabilities Act (ADA), and the ADA Amendments Act (ADAAA), UT Tyler provides reasonable accommodations for students with documented learning, physical, and/or psychological disabilities. Students with disabilities, including non-visible conditions such as learning disorders, chronic illness, traumatic brain injury (TBI), PTSD, or ADHD, or those who have received accommodations in previous educational settings are encouraged to visit https://hood.accessiblelearning.com/UTTyler and complete the New Student application. The **Student Accessibility and Resources** office (SAR) 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[1]

	Date	Topic		Cover & Reading
				Total 80 min/class
	Tue	Jan 13	Evolution of Microorganisms and Microbiology	Ch 1, 3
	Thu	Jan 15	Bacterial, Archaeal and Eukaryotic Cell Structure	Ch 3-5
	Tue	Jan 20	Viruses and Other Acellular Infectious Agents	Ch 4-5, 6
	Thu	Jan 22	Viruses and Other Acellular Infectious Agents	Ch 6, 7
	Tue	Jan 27	Microbial Growth	Ch 7
	Thu	Jan 29	Antimicrobial Chemotherapy (Review)	Ch 9
	Tue	Feb 03	**Midterm Exam #1** (Ch 1, 3, 4, 5, 6, 7, 9)	
	Thu	Feb 05	Introduction to Metabolism	Ch 10
	Tue	Feb 10	Catabolism: Energy Release and Conservation	Ch 11
	Thu	Feb 12	Anabolism: The Use of Energy in Biosynthesis	Ch 11, 12
	Tue	Feb 17	Bacterial Genome Replication and Expression	Ch 13
	Thu	Feb 19	Bacterial Genome Replication and Expression (Review)	Ch 13
	Tue	Feb 24	Paper presentation 1	
	Thu	Feb 26	**Midterm Exam #2** (Ch 10-13)	
	Tue	Mar 03	Mechanisms of Genetic Variation	Ch 16
	Thu	Mar 05	Mechanisms of Genetic Variation	Ch 16
	Tue	Mar 10	Spring break	
	Thu	Mar 12	Spring break	
	Tue	Mar 17	Recombinant DNA Technology	Ch 17
	Thu	Mar 19	Microbial Genomics	Ch 18
	Tue	Mar 24	Microbial Genomics (Review)	Ch 18
	Thu	Mar 26	Paper presentation 2	
	Tue	Mar 31	**Midterm #3** (Ch 16, 17, 18)	
	Thu	Apr 02	Microbial Taxonomy and the Evolution of Diversity	Ch 19 (11th ed)
	Tue	Apr 07	The Proteobacteria	Ch 21
	Thu	Apr 09	Biogeochemical Cycling and Global Climate Change	Ch 21, 28
	Tue	Apr 14	Paper presentation 3	
	Thu	Apr 16	Human Diseases Caused by Viruses and Prions	Ch 37
	Tue	Apr 21	Human Diseases Caused by Bacteria	Ch 37, 38
	Thu	Apr 23	Human Diseases Caused by Bacteria	Ch 38
	Tue	Apr 28	**Final Exam** (Ch 19, 22, 28, 38, 39) (8-10 am, Apr. 28)	

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