

**Biology 3328-001, 5351-001**  
**Environmental Microbiology, Fall 2018**

**General information:**

Instructor: Dr. Thomas Chrzanowski

Office: 243 Life Sciences

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Office Hours: T, Th: by appointment

Textbook: Environmental Microbiology 3<sup>rd</sup> edition, by Pepper et al., Academic Press publisher

Other reading: You are responsible for reading assigned from sources other than your textbook.

Meeting times: The class meets in LS 101 T-Th 9:30-10:50

**Student Learning Outcomes:** Microbes, while widely known for their medical importance, also play important roles in maintaining our environment, supporting agriculture, and maintaining the movement of critically important elements through the biosphere. However, little emphasis is placed upon these topics in typical General Microbiology courses; consequently, the objective of this course is to introduce you to the life of microbes in their natural environments, some of the methods used to study mixed communities of microbes in nature, and how microbes impact upon human activities.

Upon completion of the course of study you should understand the nature of the environments where microbes exist and how they are dispersed from these environments, some of the role microbes play in maintaining environmental quality, the role of microbes in major biogeochemical cycles of critically important elements, and some of the consequences of human activities on the major biogeochemical cycles of critical elements.

**Prerequisites:** Biology 1441 (General Biology) or equivalent; Biology 3444 (General Microbiology) or equivalent.

**Attendance Policy:** The University does not require monitoring attendance; each faculty member is free to establish course-specific policies on attendance. With the exceptions of exam dates, you are not required to attend lectures; however, you are responsible for all material covered in lecture including changes to the syllabus.

**Evaluation:** The lecture section will follow a traditional format of lecture with subsequent evaluation of your mastery of the topic material. While the lecture material will broadly follow the material in the book, there will often be supplemental material. Your performance in this course will be assessed through three examinations. Each exam will contribute 33.3% to your final grade. The schedule of exams will depend upon our progress through the material. The following grading scale will be used to determine your grade for the course; A - 90 to 100%, B - 80 to <90%, C - 70 to <80%, D - 60 to <70%, F - <60%. Exams may be 'curved' but in no circumstance will curves be more than 10% of the exam value and the value of any exam will not exceed 100%. No other curves or points will be credited to your score. You are required to bring to each exam a NO. 2 lead pencil and a SCANTRON 882-E electronic grading form. You may not have any other personal belongings at your desk during an exam (phone, drinks, tissues...nothing). You will not be allowed to take an exam if you do not comply. The form of examinations may be multiple choice, short essay, long essay, or whatever is best suited to the material and is solely the discretion of the instructor. You are expected to keep track of your performance throughout the semester and seek guidance from available sources (including me) if your performance drops below satisfactory levels. Depending on our progress, **Exam 3 may take place during final exam week, for this course, on 11 Dec. 2018 at 8:00 am in LS 101.**

**Late to or Absence from exams:** You are required to be present for announced examinations. You will be considered absent after one exam has been completed and turned in. Absences will be excused only with written request by a physician, other responsible professional, or with proof of jury duty. If you miss an exam, you will be given an exam score of zero. Exams missed due to excused absence must be taken within one day of your return to class. No other make-up exams will be given.

**Final review week:** A period of five class days prior to the first day of final examinations in the long sessions is designated as Final Review Week. The purpose of this week is to allow you sufficient time to prepare for final exams. During this week, there shall be no scheduled activities such as required field trips or performances; and no themes, research problems or exercises of similar scope that have a completion date during or following this week shall be assigned *unless specified in the class syllabus*. During Final Review Week, no examinations constituting 10% or more of the final grade will be given, except makeup tests and laboratory examinations. In addition, no portion of the final examination will be given. During this week, classes are held as scheduled and new concepts will be introduced as appropriate.

**Drop Policy:** You may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, you must see an academic advisor to drop a class or withdraw. If you have not declared a major, you must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is your responsibility to officially withdraw if you do not plan to attend after registering. **You will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/ses/fao>).

**Expectations for Out-of-Class Study:** Beyond the time required to attend each class meeting, you should expect to spend at least an additional 2 hours per week in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

**Academic Integrity:** You are expected to adhere to the UT Arlington Honor Code:

*I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.*

*I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.*

"Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts."

Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in suspension or expulsion from the University.

Possession of any exams used in prior sessions of this course will be considered as academic dishonesty. Those in possession of such exams will be disciplined in accordance with University policy, which may result in suspension or expulsion from the University.

**Americans with disabilities:** The University of Texas Arlington is committed to both the spirit and letter of federal equal opportunity legislation (Public Law 93112--The Rehabilitation "Act of 1973 as amended; Americans with Disabilities Act - (ADA)). It is your responsibility to inform me of your disability at the beginning of the semester and to provide authorized documentation through designated administrative channels. If you require and accommodation based on disability, I would like to meet with you in my office the first week of class to discuss your special needs. If you believe your academic performance suffers due to a disability please contact: The Office for Students with Disabilities, (OSD) [www.uta.edu/disability](http://www.uta.edu/disability) (817-272-3364) or Counseling and Psychological Services, (CAPS) [www.uta.edu/caps/](http://www.uta.edu/caps/) (817-272-3671).

**Title IX:** The University of Texas Arlington is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit [www.uta.edu/titleIX](http://www.uta.edu/titleIX) or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or [jmhood@uta.edu](mailto:jmhood@uta.edu).*

**Bomb Threats:** If you are tempted to call in a bomb threat, be aware that UTA will attempt to trace the phone call and prosecute all responsible parties. Every effort will be made to avoid cancellation of presentations/Tests caused by bomb threats. Unannounced alternate classrooms or sites will be available in the event that your classroom is not available.

**Campus carry:** Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying a handgun is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>

**Recording Devices:** The use of electronic devices to record lectures is forbidden without exception.

**Smoking, food and drink in the lecture hall:** University regulations prohibit smoking, eating, and drinking in lecture halls.

**Cell Phones:** *Ringers must be turned off during class. If your phone rings during class, pick up your belongings and quietly leave the room. Do not return until the next class. THIS INCLUDES CLASSES DURING WHICH EXAMS ARE ADMINISTERED. IF YOUR PHONE DISTURBS EVERYONE IN THE CLASS AND YOU ARE ASKED TO LEAVE, SUBMIT WHAT YOU HAVE COMPLETED AND LEAVE. YOU WILL BE GRADED AS IF YOU SUBMITTED THE EXAM AS COMPLETE.*

**Electronic Communication Policy:** The University of Texas Arlington has adopted the University “MavMail” address as the sole official means of communication. You have been assigned a MavMail account. *You are responsible for checking your MavMail regularly.* Information about activating and using MavMail is available at <http://www.uta.edu/oit/email/>. There is no charge for using this account, and it remains active even after graduation.

**Student support services:** The University provides a variety of resources and programs designed to help you develop academic skills, deal with personal situations, and better understand concepts and information related to your courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, you may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to [resources@uta.edu](mailto:resources@uta.edu), or view the information at <http://www.uta.edu/universitycollege/resources/index.php>

**Student feedback survey:** At the end of the term, you will be asked to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to you through MavMail approximately 10 days before the end of the term. Your feedback via the SFS database is aggregated with that of others enrolled in the course. Your anonymity will be protected to the extent that the law allows. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit <http://www.uta.edu/sfs>.

**After Hours Safety Escort:** The Sam Mav Escort service provides a service to assist students, faculty, staff and campus visitors to reach their destinations after regular business hours. The hours of service are 7:00 p.m. to 1:00 a.m., Sunday through Saturday. 817-272-3381.

**Emergency Phone Numbers:** In case of an on-campus emergency, call the **UT Arlington Police Department at 817-272-3003** (non-campus phone), **2-3003** (campus phone). You may also **dial 911**. **Non-emergency number 817-272-3381**.

**Emergency Exit Procedures:** Should we experience an emergency that requires us to vacate the building, you should exit the room and move toward the nearest exits, which are located immediately to the left as you exit the classroom. When exiting the building during an emergency, never take an elevator...use the stairwells. I will assist you in selecting the safest route for evacuation.

**Changes to the syllabus:** The following serves only as an outline. Our progress in covering material may warrant changes in this outline.

### **Sequence of Lecture Topics:**

#### Part I: Background and Environments:

- Introduction to Environmental Microbiology
  - Global perspectives
  - Environmental Law
- Introduction to the course (Chapters 1, 19)
  - Distinguishing between Environmental Microbiology and Microbial Ecology
  - Defining microbial species and the concept of Functional redundancy
- Aeromicrobiology (Chapter 5)
  - Microbiology of the air and microbial transport through the air
- Terrestrial Microbiology (Chapters 4 and 15)
  - Microbiology of various earth environments
  - Transport and distribution of microbes
- Aquatic Microbiology (Chapter 6)
  - Distribution of water on earth, definitions and some types of aquatic microbes
  - Aquatic systems: Oceans, Lakes, and Rivers

#### Part II: Tools of the trade:

- Tools in Environmental Microbiology (Chapters 8-13)
  - Sampling tools and their operation
  - Estimating microbial abundance and physiological approaches addressing microbial activity
  - Immunological and molecular approaches addressing abundance and activity
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#### Part II: Environmental Issues:

- Biogeochemical cycling (Chapter 16)
  - Carbon cycle and global climate change
  - Nitrogen cycle
  - Sulfur cycle
- Metals and Microbes (Chapter 18)
  - Toxicity of metals and microbial mobilization into the biosphere
- Organic pollutants and bioremediation (Chapter 17)
  - The nature of organic pollutants and microbial degradation
- Biodeterioration (Chapters 25-28)
  - Human and animal waste processing
  - Solid waste disposal and compositing
  - Drinking water processing and microbiology

Additional Information:

You are expected to be knowledgeable of materials contained in Chapters 2 and 3 (at least thru pg. 50) even though we will not cover this material in this class. This is material that you learned in General Microbiology and you know it now. Right?

You are expected to know the content of the syllabus.

Exams will occur after each part listed above.