Texas A&M University-Commerce

2600 S. Neal St, Commerce, TX 75429-3011
Biological and Environmental Sciences
Tel) 903-886-5378 Fax) 903-886-5997

BSc 509W – Microbial Ecology

Syllabus (Fall 2025)

Instructor: DongWon Choi, PhD
Office: NHS 326
Office Phone: N/A
Email: dongwon.choi@tamuc.edu (preferred)

Aug 25 – Dec 12
Web based class

Office Hours: email anytime (no immediate responses guaranteed; may take upto 3 business days)

University Statements

Academic integrity: As members of Texas A&M University-Commerce academic community, we all are responsible to uphold the principles of academic integrity expressed by this community. We are expected to watch these principles to be kept and appreciated by others.

- The first instance of cheating will result in an automatic Zero on the exam. A second instance will result in Zero course grade (automatic F).
  Cheating is defined as:
  - Copying another's test, assignment, or lecture slides
  - Communication with another during an exam (i.e. written, oral or otherwise)
  - Giving or seeking aid from another
  - Possessing or using unauthorized materials during the test
  - Buying, using, stealing, transporting, or soliciting a test, draft of a test, or answer key
- Plagiarism is a serious academic criminal activity. You must cite all sources of information with properly accredited. Copying material, whether parts or whole, will result in Zero for your term paper and can incur in further University disciplinary consequences.

USE of AI: Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, ChatBots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.

Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).

Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.

In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty
13.99.99.R0.10 Graduate Student Academic Dishonesty

Nondiscrimination Notice: Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement: Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.
For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer;
found at
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf
Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

Accommodations: The American with Disability Act (ADA) is a federal anti-discrimination statue that provides comprehensive civil rights protection for persons with disabilities. Among other aspects, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have disability requiring accommodation, please contact:

Office of Student Disability Resources or Services
Texas A&M University-Commerce
Gee Library, Room 162
Tel) 903-886-5150, 903-886-5835
Fax) 903-468-8148
Email) StudentDisabilityService@tamuc.edu

Access to student work: Copies or your work in this course including copies of any submitted papers and your portfolios may be kept on file storage for institutional research, assessment, and accreditation purposes. All work used for these purposes will remain anonymous.

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis

assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

Course Description

BSc 509, Microbial Ecology, is a course for Biological and Environmental Sciences graduate students designed to provide in-depth understanding of the interrelationship between microorganisms and their living(biotic) and nonliving(abiotic) environments. The comprehensive understanding will help students evaluating and creating a holistic approach to control and sustain environmental quality as all living organisms, including microorganisms, interplay to maintain ecological balance. The term "microbial ecology" came into frequent use only in the early 1960s. The current popularity of microbial ecology and the rapid development of this field are reflective of public interest in ecology and the scientific recognition of the essential roles of microorganisms in ecosystems.

REQUIRED Textbook:
David L. Kirchman, Processes in Microbial Ecology, Oxford University Press, ISBN: 978-0-19-958692-9

Prerequisite: Introductory Biology (microbiology or equivalents are not required but strongly recommended)

Student learning outcomes

Upon completion of this course, you should be able to;

1) Gain an appreciation for and understanding of the ecology of microorganisms

2) Explain the ways microorganisms interact with biotic environments such as other microorganisms, plants, and animals.

3) Explain the ways microorganisms interact with abiotic environments

4) Explain how and why microbial ecology is an integral of the science of microbiology.

5) Recognize and provide detailed examples of the complexity of microbial catabolism that is common to all life.

6) Comprehend how humankind may be able to manage the limited resources of "Spaceship Earth" in a wise and sustainable fashion.

On-line Class Policy

This is a "web-based" course - you don't actually attend lecture classes. Instead, all class activities will be held in D2L enters through MyLeo page. Check the website frequently (daily!!!) for announcements, instructions, and discussions. Try navigating the site early so you know that you can access everything. If you have difficulties with any material, talk to me immediately.

It is VERY important to keep up with the material (if you fall behind, there isn't much time to catch up!!!)

- Students should check lecture material, assignments, and tests on regular basis. It is strongly recommended that you schedule your specific work time that works best for you. Don't forget that the websites is active 24/7.
- The material for this class will be organized around content blocks. Students are expected to read the assigned textbook material and lecture notes and comply with given due dates for the assignments
- Exams access will be available only during the pre-announced period of time. After this given period, you will not be able to have an access to that exam.

Academic Honesty

Students who violate Texas A&M University - Commerce rules of scholastic dishonesty are subject to disciplinary penalties, including (but not limited to) receiving a failing grade on the assignment/assessment and/or test, the possibility of failure in the course, and/or dismissal from the University. Since dishonesty harms the individual, all students, and the integrity of the University, policies on scholastic dishonesty will be strictly enforced. In all instances, incidents of academic dishonesty will be reported to the Graduate School. Please be aware that academic dishonesty includes (but is not limited to) cheating, plagiarism, and collusion.

Cheating is defined as:

- Copying lecture materials while taking tests/exams
- Copying another's test of assignment
- Communication with another during an test or assignment (i.e. written, oral or otherwise)
- Giving or seeking aid from another when not permitted by the instructor
- Possessing or using unauthorized materials during the test
- Buying, using, stealing, transporting, or soliciting a test, draft of a test, or answer key

Plagiarism is a criminal activity and defined as:

- Using someone else's work in your assignment without appropriate acknowledgement
- Making slight variations in the language and then failing to give credit to the source Students must cite all sources of information. The copying of material whether parts of sentences, whole sentences, paragraphs, or entire articles, will result in a grade of zero and can result in further disciplinary action.

Collusion is defined as:

- Collaborating with another, without authorization, when preparing assignments and taking exams/tests.

Getting Started

Be sure to explore the class site at D2L. Use the first couple of days to become familiar with the class site. Remember that this is a GRADUATE level course, and therefore you will be expected to show appropriate levels of effort. You will be expected to take part in discussions in a mature and in-depth manner, to write in a clear and professional voice and you should not need excessive amount of instructor's hand-holding

Grading Policy

Term paper (see details on next page)	= 100 points
(20 pts. Topic selection & Paper outline + 80 pts. Term paper)	
Peer-review of Term paper	= 50 points
5 quizzes (10 pts. each)	= 50 points
4 lecture exams (100 pts. each)	= 400 points
Total	**600 points**

Grading Scale

The final course grade will be assigned based on the following break-down;

90 – 100%	= A
80 – 89%	= B
70 – 79%	= C
60 – 69%	= D
59% and below	= F

Teaching Methodology

Web-based Course It is VERY important to keep up with the material (if you fall behind, there isn't much time to catch up!!!). Students are strongly encouraged to print lecture slides and use them as study guide. Periodically check (daily!!) course homepage as well as your email for course announcements.

Term paper Write a review paper on one of the current research topics related to microbial ecology. Topic selection and paper outline is due by **Week 4**, and the term paper is due by **Week 15**. Both outline and term paper need to be prepared in MS word (.doc or .docx) and uploaded to the corresponding "dropbox/assignment submission folder". Misplaced assignments will not be graded.

- *Contents of the paper:* Discuss a focused "hot topic", with sufficient discussion of background information to allow anyone taking the class to understand the significance. Research approaches and future directions should also be briefly discussed. The length of the paper is minimum 8 pages of double spaced text (font size no bigger than 12). You can provide figures. Write with your classmates as the targeted readers. You should not "reuse" a topic used for other courses.
- *Sources and their use:* In recent years there has been a tendency to rely more heavily on web pages as sources. Students are warned that plagiarizing any source is a serous violation of academic standards—credit and use your sources properly. A

definition of plagiarism can be found in the section of University Statement. **Note: I allow the use of some figures downloaded from the web, but you should cite the reference or give the website. Figure legends should be your own with succinct and clear information.

- *Style:* Papers will be judged on their organization and the clarity of writing. Papers that have numerous misspellings or grammatical errors will be rated poorly and this rating will seriously impact the grade. Proofread carefully. Use spelling checkers. Have others read the paper both for clarity and content. The paper should follow a review paper writing style with citation systems of either Citation-Sequence or Name-Year.
- *Paper Outline:* You have to provide **1- page outline** of your term paper along with minimum 3 references (full-text scientific research papers in PDF format) covering your term paper topic (by Week 4).

  Categories of term paper topics you can choose from;
  - Ecological aspects of Bio-deterioration control
  - Microbial interactions with xenobiotics or inorganic pollutants
  - Microorganisms in bioenergy production
  - Microorganisms in mineral recovery
  - Microbial control of pests or disease-causing population

Peer-review You will upload your working draft of term paper by Nov. 19 and start to receive comments and suggestions from your class mates. You will incorporate those suggestions and recommendations in your finalized term paper. To receive full credit, i) you have to upload your draft by **Nov. 15**, ii) read and provide feedback on minimum 3 drafts of your classmates (due by **Dec. 1**), and iii) update your draft based on your classmates' comments and suggestions.

Exams There will be 4 exams. Exams are accessible for the duration of 1hr at a given date. The exams will consist of multiple choices, short answer questions, and assay-type questions.

Makeup Since there are no actual class meetings or sit-down exam periods, there isn't any necessity for "make-up". All work will have a due date posted. Assignments may be accepted late, but will be penalized heavily on an increasing scale (the later it is, the more point it loses). Please contact me immediately if you are "absent/inactive" long enough to miss any due dates. However, I STRONGLY RECOMMEND planning ahead to avoid such problems. Extreme circumstances will always be taken into consideration; talk to me before you assume anything.

TECHNOLOGY REQUIREMENTS

Browser support

D2L is committed to performing key application testing when new browser versions are released. New and updated functionality is also tested against the latest version of supported browsers. However, due to the frequency of some browser releases, D2L cannot guarantee that each browser version will perform as expected. If you encounter any issues with any of the browser versions listed in the tables below, contact D2L Support, who will determine the best course of action for resolution. Reported issues are prioritized by supported browsers and then maintenance browsers.

Supported browsers are the latest or most recent browser versions that are tested against new versions of D2L products. Customers can report problems and receive support for issues. For an optimal experience, D2L recommends using supported browsers with D2L products.

Maintenance browsers are older browser versions that are not tested extensively against new versions of D2L products. Customers can still report problems and receive support for critical issues; however, D2L does not guarantee all issues will be addressed. A maintenance browser becomes officially unsupported after one year.

Note the following:

- Ensure that your browser has JavaScript and Cookies enabled.
- For desktop systems, you must have Adobe Flash Player 10.1 or greater.
- The Brightspace Support features are now optimized for production environments when using the Google Chrome browser, Apple Safari browser, Microsoft Edge browser, Microsoft Internet Explorer browser, and Mozilla Firefox browsers.

Desktop Support

Browser	Supported Browser Version(s)	Maintenance Browser Version(s)
Microsoft® Edge	Latest	N/A
Microsoft® Internet Explorer®	N/A	11
Mozilla® Firefox®	Latest, ESR	N/A

Browser	Supported Browser Version(s)	Maintenance Browser Version(s)
Google® Chrome™	Latest	N/A
Apple® Safari®	Latest	N/A

Tablet and Mobile Support

Device	Operating System	Browser	Supported Browser Version(s)
Android™	Android 4.4+	Chrome	Latest
Apple	iOS®	Safari, Chrome	The current major version of iOS (the latest minor or **point** release of that major version) and the previous major version of iOS (the latest minor or **point** release of that major version). For example, as of June 7, 2017, D2Lsupports iOS 10.3.2 and iOS 9.3.5, but not iOS 10.2.1, 9.0.2, or any other version. Chrome: Latest version for the iOS browser.
Windows	Windows 10	Edge, Chrome, Firefox	Latest of all browsers, and Firefox ESR.

- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements are:
    - 512 MB of RAM, 1 GB or more preferred
    - Broadband connection required courses are heavily video intensive
    - Video display capable of high-color 16-bit display 1024 x 768 or higher resolution

- You must have a:

- Sound card, which is usually integrated into your desktop or laptop computer
- Speakers or headphones.
- *For courses utilizing video-conferencing tools and/or an online proctoring solution, a webcam and microphone are required.

- Both versions of Java (32 bit and 64 bit) must be installed and up to date on your machine. At a minimum Java 7, update 51, is required to support the learning management system. The most current version of Java can be downloaded at: JAVA web site http://www.java.com/en/download/manual.jsp

- Current anti-virus software must be installed and kept up to date.

Running the browser check will ensure your internet browser is supported.

Pop-ups are allowed.

JavaScript is enabled.

Cookies are enabled.

- You will need some additional free software (plug-ins) for enhanced web browsing. Ensure that you download the free versions of the following software:
  - Adobe Reader https://get.adobe.com/reader/
  - Adobe Flash Player *(version 17 or later)* https://get.adobe.com/flashplayer/
  - Adobe Shockwave Player https://get.adobe.com/shockwave/
  - Apple Quick Time http://www.apple.com/quicktime/download/

- At a minimum, you must have Microsoft Office 2013, 2010, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

Brightspace Support

Need Help?

Student Support

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778 or click on the **Live Chat** or click on the words "click here" to submit an issue via email.

System Maintenance

Please note that on the 4th Sunday of each month there will be System Maintenance which means the system will not be available 12 pm-6 am CST.

Class Schedule

Week 1 (Aug 25)
- Introduction
- Chapter 1 – Microbes and Microbial ecology

Week 2 (Sept 1)
- Chapter 2 – Elements, biochemical, and structure of microbes

Week 3 (Sept 8)
- Chapter 3 – Physical-chemical environments of microbes

Week 4 (Sept 15)
- **Topic selection & Outline (Sept. 19)**
- **Exam I (Chapters 1-3)**

Week 5 (Sept 22)
- Chapter 4 – Microbial primary production and phototrophy

Week6 (Sept 29)
- Chapter 5 – Degradation of organic material

Week7 (Oct 6)

Chapter 6 – Microbial growth, biomass production, and controls

Exam II (Chapters 4-6)

Week8 (Oct 13)

Chapter 7 – Predation and protists

Week9 (Oct 20)

Chapter 9 – Community structure of microbes in natural environments

Week10 (Oct 27)

Chapter 11 – Process in anoxic environments

Exam III (Chapters 7, 9, & 11)

Week11 (Nov 3)

Chapter 12 – The nitrogen cycle

Week12 (Nov 10)

Chapter 13 – Introduction to Geomicrobiology

Peer review – Draft due Nov. 15

Week13 (Nov 17)

Peer review – Revision due Dec 1

Week14 (Nov 27, Thanksgiving Break)

No classes

Week15 (Dec 1, Last day of class Dec 5th)

Wrap up your term paper **(Term paper due: Dec. 5)**

Week16 (Dec 8) Finals week

Exam IV (Chapters 12 & 13)

All dates and assignments are tentative and subject to change.