



## **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 509 – Microbial Ecology** Syllabus (Fall 2016)

Instructor: DongWon Choi, PhD

Office: 208 Science (STC)

Phone: 903-886-5221

Email: [dongwon.choi@tamuc.edu](mailto:dongwon.choi@tamuc.edu) (preferred)

Office Hours: email & eCollege anytime (no immediate responses guaranteed)

Aug 29 – Dec 16

Web based class

#### 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).
- Plagiarism is a serious academic violation. You must cite all sources of information with properly accredited citations. Copying material, whether in parts or whole, will result in a grade of Zero for your term paper and can lead to further University disciplinary consequences.

**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 statute 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 132  
Tel) 903-886-5150, 903-886-5835  
Fax) 903-468-8148  
Email) StudentDisabilityService@tamu-commerce.edu

**Access to student work:** Copies of 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.

### 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 eCollege 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.

For successful course completion, your participation is essential. Students should check lecture material, assignments, and tests on regular basis. Yes, this course is mainly self-paced. However, 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 during the semester (Aug 29 – Dec 16, 2016)

- 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.

### Technology Requirements

This course is web-based, and will therefore be administered via eCollege (see “ACCESS AND NAVIGATION). All course announcements, which mainly include news about assignments, are posted through eCollege (usually via email). In addition to reading the announcements (my emails), you will be uploading your assignments to the Dropbox. As grades are updated, I update the Gradebook. Thus, the three major components used in eCollege are Announcements, Dropbox, and Gradebook.

The following information has been provided to assist you in preparing to use technology successfully in this course.

- Internet access/connection – high speed recommended (not dial-up)
- Word Processor (Microsoft Word, OpenOffice Writer, et cetera) and Slide Program (Microsoft PowerPoint, OpenOffice Impress, et cetera)

Our campus is optimized to work in a Microsoft Windows environment. This means our courses work best if you are using a Windows operating system (Windows 7 or newer) and a recent version of Microsoft Internet Explorer (7.0, 8.0, or newer). Your courses will also work with Macintosh OS X and most Linux distributions. To launch a browser test within any operating system, login in to eCollege, click on the

„myCourses“ tab, and then select the “Browser Test” link under Support Services.

### Access and Navigation

#### ***eCollege Access and Log in Information***

This course will be facilitated using eCollege, the Learning Management System used by Texas A&M University-Commerce. To get started with the course, go to <https://leo.tamuc.edu/login.aspx>.

You will need your CWID and password to log in to the course. If you do not know your CWID or have forgotten your password, contact Technology Services at 903.468.6000 or [helpdesk@tamuc.edu](mailto:helpdesk@tamuc.edu).

#### ***Getting Started***

Be sure to explore the class site at eCollege. 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 & white paper + 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
<b>Total</b>	<b>600 points</b>

### 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** This course is partially self-paced. Therefore, 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 white paper is due by **Sept 23**, and the paper is due by **Dec. 10**. Both white paper and term paper need to be prepared in MS word (.doc or .docx) and uploaded to the corresponding “dropbox”. 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 serious 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.
- 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

Student may further develop and use a specific sub-topic from each category.

You have to provide **1- page white paper** of your term paper outline along with minimum 3 references (full-text scientific research papers in PDF format) covering your term paper topic (**Due: Friday, Sept 23**).

***Peer-review*** You will upload your working draft of term paper by Nov. 16 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. 28**, ii) read and provide feedback on minimum 3 drafts of your classmates (due by **Dec. 3**), 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 essay-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.

## Class Schedule

Week 1

Introduction

Chapter 1 – Microbes and Microbial ecology

Week 2

Chapter 2 – Elements, biochemical, and structure of microbes

Week 3

Chapter 3 – Physical-chemical environments of microbes

Week 4

**Topic selection & White paper due (Sept. 23)**

**Exam I (Chapters 1-3)**

Week 5

Chapter 4 – Microbial primary production and phototrophy

Week 6

Chapter 5 – Degradation of organic material

Week 7

Chapter 6 – Microbial growth, biomass production, and controls

**Exam II (Chapters 4-6)**

Week 8

Chapter 7 – Predation and protists

Week 9

Chapter 9 – Community structure of microbes in natural environments

Week 10

Chapter 11 – Process in anoxic environments

**Exam III (Chapters 7, 9, & 11)**

Week 11

Chapter 12 – The nitrogen cycle

Week 12

Chapter 13 – Introduction to geomicrobiology

Week 13

***Thanksgiving break***

Week 14

**Peer-review (Term paper draft uploading due by Nov. 28; review due by Dec. 3)**

Week 15

Wrap up your term paper (**Term paper due: Dec. 10**)

Week 16

**Exam IV (Chapters 12 & 13)**

***All dates and assignments are tentative and subject to change.***