



BIOL 2420-02E GENERAL MICROBIOLOGY (CRN: 21887)

COURSE SYLLABUS: SPRING 2019

INSTRUCTOR INFORMATION

Instructor: Izhar Khan
Office Location: STC 215
Office Hours: MTWR; 1:00-2:00 PM
Office Phone: 903-468-3271
Office Fax: 903-886-5988
University Email Address: izhar.khan@tamuc.edu
Preferred Form of Communication: Email
Communication Response Time: 24 hours
Class Schedule and Location: MWF, 11:00-11:50 AM, STC 122

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

Textbook(s) Required: Madigan, Martinko, Dunlab, Clark. 2009. Brock Biology of Microorganisms. Pearson Benjamin Cummings. ISBN: 978-0-13-232460-1
Newer editions are also acceptable.

Course Description

Biol 2420 is a course designed to provide basic principles of microbial life for non-biology major undergraduate students. Although relatively simple and primitive, microorganisms are considered as the most successful form of life, they are virtually everywhere and they are in tight relationship with other forms of life on earth. Unlike macroorganisms (i.e., animals, plants, insects, etc), microorganisms carry out their life processes such as energy metabolism, growth, and reproduction independently from other cells. This unique feature makes microorganisms a great tool to study the nature of life. The course will cover eukaryotic and prokaryotic microbes and viruses, with major emphasis on bacteria.

The syllabus/schedule are subject to change.

Student Learning Outcomes

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

1. Compare and distinguish the basic groups of microbes, especially prokaryotic microbes (archaea, bacteria).
2. Understand the processes needed for one bacterium to become two, and understand the mechanisms involved.
3. Compare and contrast major pathways of catabolism, specify the relative energy yield from each pathway, list the key products of each pathway, and describe biochemical pathways used for microbial taxonomy.
4. Compare and contrast major pathways of biosynthesis and list the key products of each pathway.
5. Draw a typical microbial growth curve, and predict the effect of different environmental conditions on microbial growth.
6. Compare and contrast eukaryotic and prokaryotic genomes, and gene expression in each group.
7. List different types of symbiotic interactions between microbes and other organisms, including commensalism, mutualism, and parasitism, and provide examples of each.
8. Summarize common features of microbial pathogens, with emphasis on bacterial pathogens.
9. Have a solid grasp of the scope of microbial life and its central roles in both human activities and the web of life on Earth.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

- Proficiency in using the D2L Brightspace Learning Management System in *myLEO* Online
- Microsoft Word, Excel, and PowerPoint
- Other relevant graphics programs for preparing effective PowerPoint presentations

Instructional Methods

This course consists of a series of activities and assessments to assist you in achieving the learning outcomes for all instructional units in the course.

Formal lectures will be supplemented with appropriate audiovisual materials, at home problems, laboratory exercises and discussions. PowerPoint of all lectures will be available for you in the course website in Learning Management System (D2L Brightspace) in *myLEO* Online at <https://leo.tamuc.edu/> or sent as e-mail attachments to the students in case of any issues with D2L. I will post announcements on the home page of the course for reminders of important due dates in addition to announcing them in the class. Progress in the class can be monitored in the course webpage in D2L Brightspace.

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Student Responsibilities or Tips for Success in the Course

- Dedicated study time each week to go over the materials covered in the class and the information in the relevant book chapter(s).
- Submitting assignments before deadlines.
- Regularly checking both myLEO Online (D2L) and emails for course related announcements.
- For successful course completion, your presence and participation is essential. Your attendance grade will be determined by your presence, your participation in class discussion, and your attention to the class discussion, whether by the instructor or a fellow student.
- Students should arrive ON TIME. Late arrivals are NOT acceptable.
- Students are expected to read the assigned textbook material prior to the class.
- Students MUST TURN OFF their cell phones and other potentially disruptive electronic devices. Only laptop computers are allowed to take class notes. Those laptop computers should be operated with MUTE function on (i.e. sound off). Remember, laptop is only for taking notes. You give up the privilege of using your laptop computers in class if you are caught using your computer for other activities such as reading emails, chatting, watching videos, etc.

GRADING

Final grades in this course will be based on the following scale:

A = 90%-100%

B = 80%-89%

C = 70%-79%

D = 60%-69%

F = 59% or Below

Assessments

The final course evaluation will be comprised of the lecture section (600 points; 75% of 800 total) and the laboratory section (200 points; 25% of 800 total). The Lecture section assessments consist of the following:

Term paper (see details below)	= 50 points
Three mid-term exams (100 pts. each)	= 300 points
Comprehensive final	= 150 points
Five quizzes (10 pts. each)	= 50 points
Attendance	= <u>50 points</u>
Total	= 600 Points

Term paper

Write a synopsis about one recent research article related to microbiology. Topic

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selection (10 points) before the Exam 1 (due by Week 4), and synopsis of the paper (40 points) is due by the week of Exam 3 (Week 13).

- **Topic selection:** Choose a topic relevant to microbiology. To complete the topic selection, you have to find one **Full** research article (published in a peer-reviewed scientific journal) covering your topic and upload to the **topic selection folder in Week 4** of the course website in D2L. The full research article **must** be a **PDF format**.
- **Contents of the paper:** Discuss your chosen “general topic” related to microbiology, with sufficient discussion of background information to allow anyone taking the class to understand the significance. Research approaches and future directions may also be briefly discussed. The length of the paper is about 2-3 pages of single-spaced text. You can provide figures but figures need to be thoroughly explained in the text. 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.

Exams

No exam grades will be dropped. Any student caught cheating on an exam will receive a zero for that exam. Students are responsible for supplying their own Scantron cards (Form 882-E, narrow green, 50 questions per side)

Mid-term exams. There will be three exams. The exams will consist of multiple choices, short answer questions, and short essay-type questions. Large portion of EXAM questions will be drawn from the same test pool as quiz pool. Thus, make sure to study materials covered by quiz-pool first. Essay-type questions will ask bigger picture of class lecture topics. Exams will be taken during the regular class period.

Comprehensive final. The final exam will consist of multiple choices and short answer questions, as well as essay-type questions. The exam will cover all class materials covered through the semester.

Quizzes. There will be five quizzes during the semester. Quiz schedule will be announced during class hours one week prior to the quiz. A typical quiz

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comprises seven 1-point questions. You will get 3 automatic points by simply taking the quiz.

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:

<https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>

LMS Browser Support:

https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

YouSeeU Virtual Classroom Requirements:

<https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements>

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

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. Other support options can be found here:

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<https://community.brightspace.com/support/s/contactsupport>

Interaction with Instructor Statement

The grading of the assignments, quizzes, and exams will be completed within 1-5 days depending on the length of the assignment or test. In most cases the grading will be completed within 24 hours and the questions will be discussed during the next class period. Students are encouraged to make an appointment with the instructor outside the office hours to discuss any issue related to the course individually or in groups.

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

Makeup Policy

The student is responsible for requesting a makeup when they are unable to attend the regularly scheduled examination and must schedule the makeup within 2 days of the absence. Makeup exams will be scheduled only in the event of an EXCUSED absence (as defined in the Student's Guidebook). If the test is not made-up, the student will receive a zero for that exam. **No make-ups for quizzes.** Excused absences include:

- Verified illness (with Doctor's note)
- Death in a student's immediate family
- Obligation of student at a legal proceedings in fulfilling responsibility as a citizen
- Elective TAMUC activities (with the activity director's note)

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx).
<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:

<https://www.britannica.com/topic/netiquette>

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TAMUC Attendance

For more information about the attendance policy please visit the [Attendance](#) webpage and [Procedure 13.99.99.R0.01](#).

<http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

[Undergraduate Academic Dishonesty 13.99.99.R0.03](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

[Graduate Student Academic Dishonesty 13.99.99.R0.10](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf>

Students with Disabilities-- ADA Statement

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

Office of Student Disability Resources and Services

Texas A&M University-Commerce

Gee Library- Room 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: studentdisabilityservices@tamuc.edu

Website: [Office of Student Disability Resources and Services](#)

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

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

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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.

Web url:

<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.

COURSE OUTLINE / CALENDAR

Week 1 (Jan 14)

- Chapter 1, Introduction
- Chapter 2, Microscopy and Microbial Diversity-I

Week 2 (Jan 21)

- Chapter 2, Microscopy and Microbial Diversity-II

Week 3 (Jan 28)

- Chapter 3, Cellular Components-I

Week 4 (Feb 4: **Topic Selection Due at Feb 9**)

- Chapter 3, Cellular Components-II
- **Exam 1 (Feb 8, Chap. 1-3)**

Week 5 (Feb 11)

- Chapter 4, Cellular Structure and Functions-I

Week 6 (Feb 18)

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- Chapter 4, Cellular Structure and Functions-II

Week 7 (Feb 25)

- Chapter 5, Nutrition and Metabolism-I

Week 8 (Mar 4)

- Chapter 5, Nutrition and Metabolism-II
- **Exam 2 (Mar 8, chapter 4–5)**

Week 9 (Mar 11)

- Chapter 5, Nutrition and Metabolism-III
- Chapter 6, Microbial Growth-I

Week 10 (Mar 18) Spring Break – No classes

Week 11 (Mar 25)

- Chapter 6, Microbial Growth-II
- Chapter 7, Essentials-Molecular biology-I

Week 12 (Apr 1)

- Chapter 7, Essentials-Molecular biology-II

Week 13, (Apr 8; **Term Paper Due at Apr 13**)

- Chapter 7, Essentials-Molecular biology-III
- **Exam 3 (Apr 12, chapter 6-7, 10, and 14)**
- Chapter 10, Virus and Bacteriophage
- Chapter 28, Microbial Interactions with Humans
- Chapter 34-35, Microbial Diseases

Week 14, 15 (Apr 15)

- Chapter 10, Virus and Bacteriophage
- Chapter 28, Microbial Interactions with Humans
- Chapter 34-35, Microbial Diseases

Week 16 (Apr 29)

- Catch-up on missed lectures due to weather-related closure or other academic activities such as participation in research symposia

Comprehensive Final Exam (Tuesday, May 7, 10:30 AM – 12:30 PM)

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