



Texas A&M University-Commerce

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Biological and Environmental Sciences
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BSc 254 02E – General Microbiology Syllabus (Fall 2015)

Instructor: DongWon Choi, PhD

11:00AM– 12:15PM, TR

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Office Hours: 1-4PM, TR

University Statements

Academic integrity: As members of Texas A&M University-Commerce academic community, we all are responsible to underpin 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 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.

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@tamuc.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 254 is a course for non-biology majoring undergraduate students designed to provide basic principles of microbial life. 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.

REQUIRED textbook:

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

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.

Classroom Policy

- 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.
- To create a pleasant learning environment, 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 Policy

The final course evaluation will be comprised of the lecture grade portion (75%; 600 pts total) and the laboratory grade portion (25%; 200 pts total). Lecture grade portion consists as below.

Term paper (see details below)	= 50 points
3 Mid-term exams (100 pts. each)	= 300 points
Comprehensive Final	= 150 points
5 quizzes (10 pts. each)	= 50 points
Attendance	= <u>50 points</u>
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-Enhanced Course Classroom lecture will be supplemented with lecture slides and answer keys for quizzes via eCollege. Students are strongly encouraged to print lecture slides (2-4 slides per page) prior to the class and bring to the class. Periodically check course homepage as well as your email for course announcements.

Term paper Write a synopsis about one recent research article related to microbiology. Topic selection (10pts) before the Exam 1 (due by week 4), and the paper (40pts) 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 Dropbox** of the eCollege course shell. 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 3-4 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.

Mid-term Exams There will be 3 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. Assay-type questions will ask bigger picture of class lecture topics. Exams will be taken in class hours.

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 with emphasis on materials not covered by mid-term exams (70% from materials covered by mid-term exams and 30% from materials NOT covered by mid-term exams). Large portion of Final Exam questions will be drawn from the same test pool as Mid-term pool and Quiz pool. Thus, make sure to study materials covered by those pools.

Quizzes There will be 5 quizzes given during the semester. Quiz schedule will be announced during class hours one week prior to the quiz. A typical quiz comprises seven 1-point questions. You will get 3 automatic points by simply taking the quiz.

Makeup The student is responsible for requesting a makeup when they are unable to take the regularly scheduled exams. The request should be made within 7 days of the absence. Makeup exams will be scheduled only in the event of EXCUSED absence (as defined in the Student’s Guidebook). If the test is not made-up, the student will receive 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)

Class Schedule

Week 1

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

Week 2

- Chapter 2, Microscopy and Microbial Diversity-II

Week 3

- Chapter 3, Cellular Components-I

Week 4 **(Topic Selection Due)**

- Chapter 3, Cellular Components-II
- **Exam 1 (Chap. 1-3): Thr, Sept 24**

Week 5

- Chapter 4, Cellular Structure and Functions-I

Week 6

- Chapter 4, Cellular Structure and Functions-II

Week 7

- Chapter 5, Nutrition and Metabolism-I

Week 8

- Chapter 5, Nutrition and Metabolism-II
- **Exam 2 (chapter 4-5): Thr, Oct 22**

Week 9

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

Week 10

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

Week 11

- Chapter 7, Essentials-Molecular biology-II

Week 12 (Term Paper Due)

- Chapter 7, Essentials-Molecular biology-III
- **Exam 3 (chapter 6-7, 10, and 14): Thr, Nov 19**

Week 13

Thanksgiving break, no classes

Week 14 - 15

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

Week 16

Comprehensive Final Exam (10:30 AM, Dec 15)

All dates and assignments are tentative and subject to change.