



Texas A&M University-Commerce

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Biological and Environmental Sciences
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BSc 254 – General Microbiology Syllabus (Fall 2012)

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Office Hours: 12 – 2, MWF

11:00 – 11:50 AM, MWF
Classroom: STC 122

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@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 254, General Microbiology, is a course for non-biology 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 and plants), 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 microorganisms and viruses with emphasis on bacteria.

Prerequisite: Chemistry 111 and 112 as co- or prerequisite.

REQUIRED textbook:

Madigan, Martinko, Dunlab, Clark. 2009. Brock Biology of Microorganisms. 12th Edition, Pearson Benjamin Cummings. ISBN: 978-0-13-232460-1

Student Learning Outcomes

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

1. Compare and distinguish the basic groups of microbes, including prokaryotic microbes (archaea, bacteria), and viruses, and eukaryotic microbes.
2. Understand the processes needed for one bacterium to become two, and understand the mechanisms involved.
3. Draw a typical microbial growth curve, and predict the effect of different environmental conditions on microbial growth.
4. Specify the role of microbes in global C, N, S, and P cycles, and list examples of microbes that contribute to key metabolic aspects of these cycles.
5. List different types of symbiotic interactions between microbes and other organisms, including commensalism, mutualism, and parasitism, and provide examples of each.
6. Summarize common features of microbial pathogens, with emphasis on bacterial and viral pathogens.
7. 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 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 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%) and the laboratory grade portion (25%). Lecture grade portion consists as below.

Term paper (see details below)	= 100 points
Term paper presentation	= 50 points
2 Mid-term exams (100 pts. each)	= 200 points
Comprehensive Final	= 150 points
5 quizzes (10 pts. each)	= 50 points
Attendance	= <u>50 points</u>
Total	600 points

Grading Scale (lecture [75%] and laboratory [25%] combined)

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 and exams via eCollege. Students are strongly encouraged to print lecture slides (4-6 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 review paper on one of the current research topics related to microbiology. Each student needs to submit and receive approval of their chosen topic by the end of second week (topic selection: 10% of term paper grade). This is done primarily to prevent duplication of topics as well as to increase the diversity of special topics. The term papers are due a week prior to the Thanksgiving break.

- Contents of the paper: Discuss your chosen “special topic” related to **microbiology**, with sufficient background information to allow anyone taking the class to understand the significance. The paper should be 8 pages in length (not including cover page and reference page), with a minimum of 3 scholarly sources. Failure to meet the assignment requirements will result in points being proportionally deducted. 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 figures downloaded from the web, but you should properly cite the

reference (i.e the source of the figure). 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 2 mid-term exams. The exams will consist of multiple choices and short answer 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. Exams will be taken in class hours.

Comprehensive Final The final exam will consist of multiple choices and short answer 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 up to 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 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 3 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.

Presentation Each student will give 8-minute presentation that includes time for questions (6 minute presentation followed by 2 minute question). The presentations should be well-prepared, concise, and include sufficient visual aids. The presentation will be evaluated by your classmates (60%) and the instructor (40%).

Class Schedule

Week 1

Introduction

Brief history of microbiology

Week 2

Microscopy

Cellular components (**Topic due**)

Week 3

Cellular structures and functions – I

Week 4

Cellular structures and function – IV

Metabolism

Week 5

Metabolism
Microbial growth
Week 6 **Exam I (week 1 - 5)**
Microbial growth
Essentials of molecular biology
Week 7
Essentials of molecular biology
Viruses and Virology
Week 8
Viruses and Virology
Principles of bacterial genetics
Week 9
Principles of bacterial genetics
Metabolic diversity
Week 10
Metabolic diversity
Week 11 **Exam II (week 6 - 10)**
Metabolic diversity
Microbial evolution and systematics
Week 12
Microbial evolution and systematics
(Term paper due)
Week 13
Microbial growth control
Thanksgiving Holiday - No class
Week 14
40. Student presentation
41. Student presentation
42. Student presentation
Week 15
43. Student presentation
44. Student presentation
45. Student presentation
Week 16 (10:30 - 12: 30, Wed, Dec. 12)
Final Exam (comprehensive, week 1- 13)

All dates and assignments are tentative and subject to change.