BIOL 275: Microbiology — Spring 2014

CLASS TIME/LOCATION: TUES/THUR 11:30 A.M. -12:45 P.M. Lecture Hall 1-101

INSTRUCTORS:

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OFFICE HOURS: Posted on Blackboard.

COURSE DESCRIPTION: ***Welcome to Biology 275; Microbiology Lecture!*** In this course you will be learning about the basic biology, biochemistry, and genetics of microbes, as well as their role in the environment, food production, sanitation, diseases and host organism's defenses.

REQUIRED TEXTBOOK: *Microbiology With Diseases by Body System,* 3rd ed. by Robert W. Bauman. Pearson Education/Benjamin Cummings, 2011.

Please note: An **online resource** called "Mastering Microbiology" is available that accompanies this textbook. **This is NOT required for this course**. However, it contains self-quizzes, tutorials, videos, etc. that may be a helpful addition for you in this class.

There are additional options that you should know about:

--If you have already purchased the 3rd edition, of the textbook, and would like to purchase an access code for Mastering Microbiology, you can buy one from the publisher for ~$60. It is up to you.

--If you feel you do not need an actual hardback book, you can purchase an access code with an eText from the bookstore or the publisher. This is an interactive form of our textbook that is all online. The total for this is ~$90; the only downside to this is that access to the eText expires sometime after the course is over, so if you want to keep your textbook for the future, we suggest you buy a hard copy.

BLACKBOARD: All relevant information, communication and material for the course will be posted to the class Blackboard site. Blackboard will also be used to make course announcements, to administer quizzes, and to give you resources other than the lecture and textbook. Announcements will be emailed from Blackboard for which you will be responsible. Make sure your UMBC email address is working and that you check it frequently!

COURSE LEARNING OBJECTIVES: With the successful completion of this course the student will be able to:

- Outline the historical origins of microbiology including its interrelationship with the theory of biogenesis and germ theory of disease.
- Identify the major groups of microorganisms according to their taxonomic classification and describe their main characteristics.

- Compare and contrast prokaryotic and eukaryotic cells in terms of their structure, replication of DNA, and flow of genetic information within the cell.
- Relate how the biological features of a particular microbe enable it to cause disease.
- Describe general patterns of regulation of gene expression, recombination of genetic information, and exchange of genetic information.
- Identify the physical and chemical factors that influence the growth of microorganisms.
- Explain common physical and chemical methods used to inactivate or limit the growth of microorganisms, including antimicrobial therapies.
- Summarize the modes of transmission of disease including pathogenic mechanisms used by microbes to invade and damage the host.
- Describe the nonspecific and specific immune defenses of the host against microbial infection.
- Link the topical scientific issues of the day to the material covered in lecture.

WHAT YOU SHOULD ALREADY KNOW: The concepts and information presented in this course should be readily comprehensible since you have fulfilled the prerequisite as stated in the UMBC catalog (BIOL 141 or equivalent) and you are expected to be familiar with the following terms and concepts:

-Atoms, molecules, and elements
-Chemical bonds: Covalent bond, ionic bond, hydrogen bond; pH
-Hydrophobic and hydrophilic interactions, polar and non---polar compounds
-Organic Macromolecules-Structure and Function
-Carbohydrates
-Lipids
-Proteins: Amino acids; primary, secondary, tertiary, and quaternary structure
-Nucleic acids: DNA, RNA (mRNA, tRNA, rRNA)
-Membrane structure: Lipid bilayer, membrane proteins, and fluid mosaic model
-Respiration and photosynthesis
-Enzymes
-Gene expression and Central Dogma: replication, transcription, and translation

Note: If you have trouble with this information, you must learn it on your own (see chapter 2 in your textbook); otherwise, it is strongly recommended that you drop the class and return when you have learned these basic concepts.

COURSE INFORMATION AND EXPECTATIONS: On the last page is the tentative lecture schedule and reading assignments. We urge you to attend each of the lectures and to read the assigned material. You will not succeed in the course without doing both.

READING ASSIGNMENTS: The textbook we chose (*Microbiology with Diseases by Body System* by Bauman; 2011) is an excellent one, both for the course, and for reference later in your career. We urge to keep up with your reading since it complements and reinforces lecture material. **A good guideline is to do 2 ½ hours of out-of-class work for each class hour**. No kidding! You will gain much more insight if you've done the reading **before** the lecture pertaining to that material. Use the textbook's index and glossary liberally. We may assign additional reading assignments in class or through Blackboard.

LECTURES: Take good notes. The PowerPoint slides we use in our presentations will merely **highlight** and outline what is being said, and should not be considered the only information learned. The slides will be made available on Blackboard. We do not expect you to be sponges, absorbing lecture material and squeezing it out during the exams. To do well, you will need to understand the concepts and to be able to think critically. Ask questions during lecture. If you do not understand something, feel free to visit us during our office hours or schedule an appointment. If you miss lecture, do not rely solely on lecture slides to cover the missed material but make sure you obtain notes from a classmate.

CELL PHONE POLICY: Please turn cell phones off or on silent during lecture. They are disruptive to us and to your fellow students.

GRADING: Your grade will depend upon your performance on three exams and a comprehensive final, as well as your performance on quizzes. The final will include material covered after the last mid-term, and the comprehensive part.

Exam 1	20%	
Exam 2	20%	
Exam 3	20%	
Exam 4	10%	(taken with the Final Exam)
Quizzes	15%	
Final Exam	15%	
TOTAL	100%	

Grades for this course will be determined from the following scale:

≥90% = A
80%-89.9% = B
70%-79.9% = C
60%-69.9% = D
≤ 59.9% = F

Note: If your grade falls within the ranges listed above, you are assured of that letter grade. Depending on the class mean at the end of the semester, this range may be adjusted. In other words, if the course average is lower than the middle C range (i.e. 75%), we will adjust the ranges to reflect that.

EXAMINATIONS: The exams are scheduled well in advance. We expect everyone to take them as scheduled! If you become ill or a family emergency arises, let us know before the exam. Contact us or, if necessary, call the Biology Department secretary (410-455-2261). Make-up exams will be given only with a valid written excuse. Quizzes will be given through the course Blackboard web page. Scores will be posted in the online grade book and the course Blackboard page.

QUIZZES: You will be expected to take online quizzes on Blackboard on the assigned reading material **before** that particular class where we begin a new chapter. Once the due date for a quiz has passed, you may take it but you will not receive a score. Your lowest quiz score will be dropped.

GET YOUR QUESTIONS ANSWERED: We will be available to answer questions during our office hours (see Blackboard for details). If questions come up during your studying, you can email us, and/or post your question on the Discussion Board on Blackboard. The course Blackboard site will be used to make course announcements and to give you resources other than the lecture and textbook. Your login ID and password are your username and password on the UMBC web pages. We encourage you to use to post your questions as well as to post answers to other students' questions on the Blackboard Discussion Board. Be advised: we will post questions periodically. You just might see some of these on the exams. We may email announcements from Blackboard for which you will be responsible. Make sure your UMBC email address is working and that you check it frequently.

ACADEMIC INTEGRITY: Information on the UMBC policy on academic integrity can be found at: http://www.umbc.edu/undergrad_ed/ai/students.html

From the UMBC Handbooks: "By enrolling in this course, each student assumes the responsibilities of an active participant in UMBC's scholarly community in which everyone's academic work and behavior are held to the highest standards of honesty. Cheating, fabrication, plagiarism, and helping others to commit these acts are all forms of academic dishonesty, and they are wrong. Academic misconduct could result in disciplinary action that may include, but is not limited to, suspension or dismissal. To read the full Student Academic Conduct Policy, consult the UMBC Student Handbook, the Faculty Handbook, or the UMBC Policies section of the UMBC Directory".

Let us add: we take academic integrity seriously and will not tolerate any academic dishonesty.

Anyone charged with academic misconduct (as defined below) in any aspect of the course that is graded (exams, quizzes, assignments, etc.) will be reported to the UMBC Academic Conduct Committee, and, at minimum, receive a grade of zero for that exam or assignment and a letter grade deduction in the course.

Academic Misconduct means cheating, fabrication, facilitating academic misconduct, plagiarism, or dishonesty by an undergraduate student.

See the UMBC Undergraduate Student Academic Policy with this link:
http://www.umbc.edu/undergrad_ed/ai/documents/ACC2011.pdf

STUDENTS WITH DISABILITIES: UMBC is committed to eliminating discriminatory obstacles that may disadvantage students based on disability. If you have a disability and want to request accommodations, contact SSS in the Math/Psych Building, Room 213 or Academic IV-B wing Room 345 (or call 410-455-2459 or 410-455-3250). SSS will require you to provide appropriate documentation of disability and complete a Request for Services form available at http://my.umbc.edu/groups/sss. If you require accommodations for this class, make an appointment to meet with either instructor to discuss your SSS-approved accommodations.

DATE	Topic	LECTURER	READING
Jan 28	Introduction	HJS/SBS	Ch 1
Jan. 30	History and Classification of Microorganisms	SBS	Ch.3/Ch.4; pp.114-121
Feb. 4	Cell Structure and Function	SBS	Ch. 3/Ch. 11; pp319-322
Feb. 6	Microscopy and Staining	SBS	Ch.4; pp.96-112
Feb. 11	Enzymes and Metabolism I	HJS	Ch. 5
Feb. 13	Metabolism II	HJS	Ch. 5
Feb. 18	Metabolism III	HJS	Ch. 5
Feb. 20	Microbial Nutrition and Growth	HJS	Ch. 6
Feb. 25	****EXAM I** (Review on Feb. 24, Noon – 12:50, Room TBA)**		
Feb. 27	Controlling Microbial Growth in the Environment	HJS	Ch. 9
Mar. 4	Central Dogma	HJS	Ch. 7
Mar. 6	Microbial Genetics I	HJS	Ch. 7
Mar. 11	Microbial Genetics II	HJS	Ch. 7
Mar. 13	Recombinant DNA Technology	HJS	Ch. 8
March 17 - March 21 SPRING BREAK!			
Mar. 25	Characterizing and Classifying Prokaryotes	HJS	Ch. 11
Mar. 27	Applied/Environmental Microbiology	HJS	Ch. 25
Apr. 1	****EXAM II** (Review Session Mar. 31, Noon – 12:50; Room TBA)**		
Apr. 3	Viruses I	SBS	Ch. 13
Apr. 8	Viruses II	SBS	Ch. 13
Apr. 10	Viruses III	SBS	Ch. 13
Apr. 15	Infection and Infectious Diseases/Epidemiology I	SBS	Ch. 14
Apr. 17	Infection and Infectious Diseases/Epidemiology II	SBS	Ch. 14
Apr. 22	Innate Immunity	SBS	Ch. 15
Apr. 24	Adaptive Immunity	SBS	Ch. 16
Apr. 29	****EXAM III** (Review Session Apr. 28, Noon – 12:50; Room TBA)**		
May 1	Adaptive Immunity	SBS	Ch. 17
May 6	Immunity and Vaccination	SBS	Ch. 18; pp.502-509
May 8	Antimicrobials	TBA	Ch. 10
May 13	Antimicrobials (cont'd)	TBA	Ch.10
May 15	****EXAM IV and FINAL EXAM** 10:30 – 12:30 (Review Session TBA)**		