

**Biology 235: Microbiology
Fall 2011**

Instructor: Dr. Heather B. Felise

Classrooms: Lecture – Collier Hall of Science Room 202
Lab – Collier Hall of Science Room 300

Time: Lecture - MWF 8:55 – 9:45am
Lab – MW 1:15 – 3:15pm

Office: Hall of Science Room 323

Office Hours: Tuesdays 10 – 11am, Thursdays 9 – 10am and Fridays 1 - 3pm or by appointment

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Required Textbook: *Prescott's Principles of Microbiology*, by Joanne M. Willey, Linda M. Sherwood and Christopher J. Woolverton, McGraw-Hill Higher Education, 2009.

Required Lab Manual: *Microbiology: Laboratory Theory and Application 3rd Edition*, by Michael J. Leboffe and Burton E. Pierce, Morton Publishing Company, 2010.

COURSE DESCRIPTION: This course serves as an introduction to microbiology (the study of organisms too small to be seen with the naked eye), with a focus on the central role of microbes in the field of biology, the unique metabolic and organismal diversity of microbes, and their role in history from the origin of life to modern times. In addition, we will investigate the mechanisms used by all animals, including humans, to ward off infectious diseases and the pathogenesis, immune invasion, and mechanisms of toxin action of infectious agents. Although microbiology is a rapidly expanding field of science, too broad to be completely covered in a single semester course, I hope that you will leave with an appreciation and enthusiasm for the breadth of microorganisms that exist and the critical role they play in our environment and health.

COURSE OBJECTIVES:

By the end of this course students should have mastered content in the following areas:

- Function of prokaryotic cell structures in comparison to those found in eukaryotes
- Mechanisms involved in energy flow and transformation
- Methods of microbial control
- Range of biological diversity in the microbial world
- Role of microbes in food production
- Fundamental principles of genetics, with specific emphasis on prokaryotic genetics
- Host defenses
- Microbial diseases

By the end of this course students will have had the opportunity to:

- Use qualitative and quantitative microbial techniques
- Objectively analyze and interpret data
- Apply means by which scientists ask and answer questions

LECTURE:

Lecture exams: There will be four exams, each worth 75 points, given during the designated lecture sessions (Please see the attached course schedule). The 4th exam will be given during the final exam period and **will NOT be cumulative**. In the event of special needs (such as medical excuse or family emergency), arrangements for taking a make-up exam must be made in advance and documentation for absence, e.g. a doctor's note, is required. If there is an emergency please contact me ASAP. **Make-up exams may be oral** and will be given at a time I deem appropriate.

LAB:

Attendance: Attendance in the laboratory is mandatory and you should assume each lab will take the entire class period. Due to the nature of the experiments, **there will be no make-up labs**. You are expected to read the assigned lab exercises **prior** to coming to lab. This includes assigned sections of the lab manual and those exercises posted on blackboard. **It is my experience that students who do not attend and actively participate in laboratory exercises, do not do well in this course.**

Safety: Close-toed shoes are required - that means no flip-flops or sandals! If you wear inappropriate footwear, you **will not be allowed to stay in lab**. Protective lab coats will be provided and their use is mandatory. Additional safety information will be provided in the laboratory.

Lab reports: The lab reports will consist of the exercises found in the laboratory manual and will include all data, as well as answering questions at the end of the exercise. They are due the lab period following completion of the experiment. Due to copyright laws, please use and submit the sheets from the lab notebook. Lab reports will be worth 5 points each, unless otherwise noted by the instructor.

Quizzes: In order to encourage attendance and preparedness for lab, **4 quizzes, each worth 15 points**, will be given during the designated laboratory sessions (Please see attached course schedule). These quizzes will be given at the beginning of the lab period and will assess basic information about lab exercises either to be performed that day or recently completed. You will have the first 15 minutes of the laboratory period to take the quiz; if you are late to class your quiz will be due when the rest of the class finishes with their quiz. **Quizzes cannot be made up**, but your lowest quiz grade will be dropped when computing your final grade.

Practicum: The laboratory practical exam will be based on experiments done in class and will include specimen slides under the microscope, cultures on specific growth media and identification of biochemical reactions. In other words, anything done in the lab may show up on this exam. You may not use your notes or lab manual for the exam.

GRADING: The final grade in the course will be based upon the following items:

Lecture: (50% of final grade)

- Lecture Exams 1-4 (4 x 75 points each) 300 pts.
- Class Participation/Attendance 25 pts.

Laboratory: (50% of final grade)

- Laboratory Reports/Exercises 150 pts.
- Laboratory Practicum 100 pts.
- Laboratory Quizzes 45 pts.
- Laboratory Unknowns 30 pts.

BLACKBOARD: All information, including announcements, lecture slides and study guides, associated with this course will be posted on Blackboard. You must register for this course on Blackboard the first week of class. Your opportunity to register will **expire** on Monday, September 5th. For instructions visit the following website: <http://home.moravian.edu/public/cit/help/blackboard/bbstudent.asp>. The course ID is BIO235.FA11 and the enrollment code is "microbes". When registering, please use the email account where you would like to receive course notifications.

CLASS POLICIES:

Cell phones: Turn all cell phones OFF before class! No calls or texting during class.

Academic Integrity: I expect all class members to adhere to the Moravian College policy on academic honesty (please see Student Handbook). If dishonesty is observed on a student's exam, a course grade of an F will be assigned for the class and the individual will not be allowed to withdrawal from the course. If dishonesty is observed on an assignment, the student will receive a zero for that assignment.

Disability Support: Students who wish to request accommodations in this class for a disability should contact Mr. Joe Kempfer, Assistant Director of Learning Services for Disability Support, 1307 Main Street (extension 1510). Accommodations cannot be provided until authorization is received from the office of Learning Services.

Tentative Course Schedule

DATE	LECTURE TOPIC(S)	READING		EXERCISE(S)
Week 1: 8/29 - 9/2	Introduction, History, Bacterial Cell Structure	Ch. 1, Ch. 3	Safety, Media, Ubiquity, Microscopy	Week 1a: 1-2, 2-1 Week 1b: 2-1*, 3-1, 3-2, 3-3
Monday 9/5	No Lecture		No Lab	
Week 2: 9/6 - 9/9	Bacterial Cell Structure	Ch. 3	Aseptic Transfer, Streak Plate, Staining	Week 2a: No LAB Week 2b: 1-3, 1-4, 3-5
Week 3: 9/12 - 9/16	Eukaryotic Cell Structure, Microbial Growth/Nutrition	Ch. 4.1-4.8, Ch. 6, Ch. 7	Special Stains, Evaluation of Media	Week 3a: 3-7, 3-10, 1-3*, 1-4*, Week 3b: QUIZ #1 , 2-5, 4-5, 4-6
Week 4: 9/19 - 9/23	Microbial Growth/Nutrition EXAM 1 WED. 9/21	Ch. 7., Ch. 8	Bacterial Growth	Week 4a: 2-6, 2-9, 2-11, 2-5*, 4-5*, 4-6* Week 4b: 6.1, Growth Curve Excel Assignment
Week 5: 9/26 - 9/30	Control of Microorganisms Introduction to Metabolism, Catabolism: Energy Release and Conservation	Ch. 9, Ch. 10	Microbial Nutrition, Chemical Germicides	Week 5a: 5-12, 5-14, 5-15, 5-17 Week 5b: 5-23, 2-14, 5-12*, 5-14*, 5-15*, 5-17*
Week 6: 10/3 - 10/7	Catabolism: Energy Release and Conservation, Microbial Diversity	Ch. 10,	Sugar Ferm., IMViC, Catalase, Urease, Oxidase, Motility	Week 6a: 5-3, 5-4, 5-8, 5-13, 5-20, 5-23*, 2-14* Week 6b: QUIZ #2 , 5-5, 5-6, 5-3*, 5-4*, 5-8*, 5-13*, 5-20*
Monday 10/10	No Lecture			Week 7a: No Lab
Week 7: 10/12 - 10/14	Microbial Diversity, Food Microbiology	Ch. 34	Enterotube	Week 7b: 5-30
Week 8: 10/17 - 10/21	EXAM 2 MON. 10/17 Genes: Structure, Replication, and Expression	Ch. 12	Milk Test, Isolating Luminescent Bacteria, UV	Week 8a: 9-1, 5-30* Week 8b: modified 8-9, 2-13
Week 9: 10/24 - 10/28	Genes: Structure, Replication, and Expression, Regulation of Gene Expression	Ch. 12, Ch. 13	Normal Skin Flora	Week 9a: Skin Flora (Handout), 8-9*, 2-13* Week 9b: QUIZ #3 , Skin Flora*, 8-9**
Week 10: 10/31- 11/4	Mechanisms of Genetic Variation, Viruses, Genetic Exchange	Ch. 14, Ch. 5.1-5.4	Throat Culture, Transformation	Week 10a: Transformation (Handout), skin flora** Week 10b: 5-25, Transformation*
Week 11: 11/7 - 11/11	Genetic Exchange EXAM 3 WED. 11/9	Ch. 14, Ch. 28	Snyder Test, Water Analysis	Week 11a: 7-3, 5-25*, Transformation** Week 11b: 8-13, 7-3*
Week 12: 11/14 - 11/18	Nonspecific Host Resistance Nonspecific Host Resistance, Specific Immunity	Ch. 28, Ch. 29		Week 12a: UNKNOWN, 8-13* Week 12b: QUIZ #4 , UNKNOWN, 8-13**
Week 13: 11/21	Pathogenicity of Microorganisms	Ch. 30		Week 13a: UNKNOWN Week 13b: No Lab
Wednesday 11/23	No Lecture			
Friday 11/25				
Week 14: 11/28 - 12/2	Pathogenicity of Microorganisms, Antimicrobial Chemotherapy	Ch. 30, Ch. 31		Week 14a: UNKNOWN Week 14b: UNKNOWN, 7-6
Week 15: 12/5 - 12/7	Viral Diversity, Vaccination	24.2 (Herpes, Smallpox), 24.5 (Polio), 24.6 (Flu), 33.8		Week 15a: Clean Lab Week 15b: LAB PRACTICUM
Friday 12/9 8:30am	EXAM 4 (NOT CUMULATIVE)			