August 10, 2011

MOLB/MICR 2021
GENERAL MICROBIOLOGY
Course Syllabus: Fall Semester 2011

Course Description and Goals

Microbiology is the study of life forms and agents that are too small to be seen with the unaided eye. These tiny microorganisms are present on our skin, clothes and this piece of paper. While some microorganisms are disease-causing pathogens, most are harmless and are, in fact, absolutely essential to all life. Without these organisms we would not have many of our favorite foods and beverages, key elements would not be recycled for human and plant use, and all life on planet Earth would end.

This course will provide an introduction to microbiology. We will look first at microbial cell biology, spending time exploring cell structures. The metabolic, energy producing and biosynthetic pathways of microorganisms will be reviewed and microbial genetics will be introduced. The course will also focus on the evolution and diversity of microbes and their ecological significance. Finally, we will explore the impact of microorganisms on humans, including their pathogenicity strategies and the host defense mechanisms used to combat infectious diseases.

General Microbiology builds on several central themes in biology that were introduced in LIFE 1010, including: 1) Cell / Molecular Biology and Molecular Genetics, 2) Physiology and Metabolism, 3) Evolution and Diversity, 4) Ecology. These themes will be presented in an integrated fashion throughout the course. The course is intended for students pursuing diverse majors, including Biology, Botany, Molecular Biology, and Microbiology. However students in degree programs ranging from Science Education to Engineering may find that the course makes a valuable contribution to their undergraduate experience. Students must enroll in both a lecture and laboratory section. The prerequisites for the General Microbiology course are a passing grade of C in Biology 1010 (General Biology I) and in Chemistry 1000 or Chemistry 1010.

Instructor

Name	Section	Time and Day	Room	Office/Phone	Email @uwyo.edu	Office Hours*
Rachel Watson	01	MWF 11:00-11:50am	BU AUD	AG 5010 766-3524 314-9636 (Google)	rwatson	2:00-3:25 pm W 7:30-8:30 pm M (online *Elluminate*) 7:30-8:30 pm T (online *Second Life*) 12-2 pm F and by appointment

* A review session will be held every Friday from 12-1 pm in the lab (AG 5030).

*Office hours are not designed for and do not cater to students desiring a confidential meeting. There is often more than 1 student in my office at once and we frequently talk as a group. Please schedule alternative times for individual, confidential meetings.

Textbooks and required materials

1. *Prescott's Microbiology ,* Eighth Edition by Willey, Joanne M., Sherwood, Linda M. and Christopher J. Woolverton, McGraw-Hill-Boston.
2. General Microbiology Laboratory Manual by Rachel Watson

Optional Textbooks

1. *A Photographic Atlas for the Microbiology Laboratory* by Michael J. Leboffe and Burton E. Pierce
2. *The Omnivore's Dilemma* by Michael Pollan

Additional Resources (These sources provided background information for some lectures and would make great additional resources!)

Bryson, Bill. A Short History of Nearly Everything. Broadway Books. 2003

Madigan, Michael T., Martinko, John M. and Jack Parker. Brock Biology of Microorganisms. Upper Saddle River, NJ: Prentice Hall. 2000.

Lubert Stryer. Biochemistry. New York: W. H. Freeman and Company. 1995.

Becker, Wayne M., Reece, Jane B. and Martin F. Poenie. The World of the Cell. Menlo Park, CA: The Benjamin/Cummings Publishing Company. 1996.

Horton, Robert H., Moran, Laurence A., Rawn, David J., and Gray K. Scrimgeour. Principles of Biochemistry. Upper Saddle River, NJ: Prentice Hall. 2005.

Murray, Patrick R., Rosenthal, Ken S., Kobayashi, George S., and Michael A. Pfaller. Medical Microbiology. St. Louis, Mosby. 1998.

Nester, Eugene W., Anderson, Denise G., Roberts, C. Evans Jr., Pearsall, Nancy N., and Martha T. Nester. Microbiology: A Human Perspective. Boston, McGraw Hill, 2004.

Lectures

All lecture notes will be posted on the class web site at:

http://www.uwyo.edu/molb2210_lect

Those who desire an outline for the material that will be discussed in lecture can print these notes before class. During lectures we will discuss concepts, applications and implications, outline goals, and present demonstrations. **Attendance at all lectures will greatly improve your understanding of the material and your performance on assignments and exams!** Reading the appropriate section in the textbook may help to enhance your understanding of lecture material. All lectures are highly participative; time will be taken to consider and discuss all student questions, concerns and thoughts.

Homework

Weekly problem assignments will be posted on the class eCompanion Course Shell. These homework assignments will be posted on Tuesday and will be due the following Tuesday at 5:00 pm. Answers will be entered online in eCompanion. All homework questions will relate specifically to the lecture material covered during the week prior to the homework due date. **There are 10 homework assignments worth 5 points each for a total of 50 points as part of your lecture grade**.

Current Events

Microorganisms are in the news! There is at least one article, even in the local paper, everyday about a current topic in Microbiology. Form a group of 5 or 6 students and choose a topic that interests you. Monitor the news on this topic and find some additional journal references to give your group scientific background. Your research will be presented in a poster presentation at the end of the semester. Please be sure to read the assignment description provided on the course web site!! **Your poster presentation project is worth a total of 50 points as part of your lecture grade**.

Exams: Exams (except the Final) are given on Tuesday evenings from 7:00-9:00 pm in AG 5030

Exam 1: Tuesday, September 13th Exam 3: Tuesday, November 8th
Exam 2: Tuesday, October 18th Final Exam: Wednesday, December 7th (10:15 – 12:15 AB foyer)

Absences from an exam will only be excused under very special circumstances. Excused absences include university sanctioned events, extreme illness, or other extenuating circumstances. If you will miss an exam due to a university-sanctioned event, you must contact me in advance. If you miss an exam with an acceptable excuse you must contact me immediately. Failure to notify me, or a TA at the soonest possible time will result in a zero on the missed exam.

Make-up Exams

Exams missed due to university sanctioned events will be scheduled individually and taken in advance. These exams will have the same format as the regularly scheduled exams. Students missing exams because of other verified and acceptable excuses must individually schedule a time to take a make-up exam. Make-up exams will have the same format as the regularly scheduled exams and must be taken as soon as possible after returning to classes.

Grades

Your grade will be based on a maximum of 800 points. Lab accounts for 200 of these 800 points and it is possible to earn 600 points in lecture**. Grades for individual assignments can be viewed on eCompanion throughout the semester**.

Lecture points are divided as follows:

Three semester exams (100 pts. each)	300 pts
Homework (10 assignments at 5 points each)	50 pts
Current events poster presentation	50 pts
Final Exam	200 pts
Total	600 pts

Each of the 3 lecture exams is worth 100 points. The final exam is 200 points and will include ~100 points of comprehensive material over exams 1, 2, and 3 plus an additional 100 points over new material presented in the last section of the course. Finally, the 10 homework assignments are worth 5 points each for a total of 50 points and your final poster presentation is worth 50 points.

Individual semester course grades are not curved and are calculated as follows:

A	B	C	D	F
90-100%	80-90%	70-80%	60-70%	< 60%

Laboratory

Labs will begin on Thursday, August 25th. The labs are held in Agriculture room 5030:

Section 10: TR 8:00-9:50 am	Section 12: TR 1:10-3:00 pm
Section 11: TR 10:00-11:50 am	Section 13: TR 3:10-5:00 pm

In the laboratory you will have the opportunity to experience directly some of the relationships discussed in the lecture and textbook. You will also apply experimental techniques to solving problems. The laboratory is extremely important to gaining an understanding and appreciation of microbiology. **Laboratory attendance is mandatory. It is the course policy that two absences not made up in the laboratory will result in an F in the entire course, regardless of lecture grades**. The laboratory will include a total of 200 points and will count for 25% of the course grade.

Procedure for Making Up a Lab

Your laboratory Teaching Assistant will take attendance each laboratory period. If you miss a lab, you will be allowed to make up the lab ONLY if you notify your TA or instructor and you are involved in a recognized University activity or have a verified illness or hardship. Up to three excused absences will be universally allowed. Additional excused absences must be University-sponsored. **Missed laboratory exercises must be made up during the open lab hours scheduled on Fridays from 12:00-2:00 p.m.** Missed labs must be made up within 10 days after the missed lab. Please refer to the laboratory syllabus for more details on procedures for making up a lab.

Academic Dishonesty

Representing the work of others as your own constitutes academic dishonesty and is strictly forbidden in this course. The official University definition of academic dishonesty is: *An act is academically dishonest when it is an act attempted or performed which misrepresents one's involvement in an academic task in any way, or permits another student to misrepresent the latter's involvement in an academic task by assisting in the misrepresentation.* Further information and some specific examples of academic dishonesty can be found at: http://uwadmnweb.uwyo.edu/legal/Uniregs/ur802.htm. All sources (whether printed or verbal) used in assignments and projects, including those located on the WEB, need to be correctly cited. If you use 5 or more words from a source just as they are used in the source, you need to put those words in quotation marks and cite the source. It is better to not use quotes, but rather paraphrase and cite the source. If necessary, we will use electronic means to detect plagiarism. Students involved in any form of academic dishonesty can as a minimum, receive an automatic "F" in this course.

Non- Discrimination Statement

A campus environment characterized by diversity, free inquiry, free expression has always been a top priority of the University of Wyoming. Civil discourse is an essential aspect of the search for and transmission of knowledge. Words and actions that promote and encourage self-worth, respect and dignity are consistent with the university's mission. Conversely, words or actions that reflect prejudice, stereotypes and discrimination are antithetical to the mission of the university and will not be tolerated. Specifically, racist and other discriminatory or harassing conduct based on gender, color, disability, sexual orientation, religious preference, national origin, ancestry or age impair and disrupt legitimate university functions. Every effort, within the context and protection of the First Amendment rights, will be expended to eliminate such conduct from the campus community. Teaching students to live productively in a multicultural/multiethnic society is a process that must take place within a constructive and harmonious environment. It is the obligation of the faculty, staff, students and the administration of the University of Wyoming to provide this environment.

It is the policy of the University to accommodate students with disabilities, pursuant to federal and state law. Any student who needs accommodation because of a disability should inform the instructor at the beginning of the course. Students with disabilities who seek accommodations must contact Student Educational Opportunity Services, Knight Hall room 330, at 766-6189.

Course Contacts

If you have any concerns with the lecture or laboratory portions of the course, you should first contact your lecture instructor and/or your laboratory T.A.. Questions related to the laboratory should first be directed towards your laboratory Teaching Assistant. If you have course related concerns that cannot be addressed by the lecture instructor, feel free to contact the Microbiology Program Director, Dr. Gerry Andrews, at 766-3139 or preferably by e-mail (GAndrews@uwyo.edu).

TENTATIVE LECTURE SCHEDULE

Date	Day	Lecture	Topic	Reading Assignment	Homework assignment
Aug. 22	M	1	Overview and Scope of Microbiology	Chapter 1 (pp. 13-22)	*Pre-test and Knowledge Survey*
Aug. 24	W	2	Review of Macromolecules	Appendix 1	
Aug. 26	F	3	Cell Structures and Functions	Chapters 3 and 4	Homework set #1
Aug. 29	M	4	"	"	*Poster presentation: Group members and Topic*
Aug. 31	W	5	Microbial Growth	Chapters 6 and 7 (excepting p. 167)	
Sept. 2	F	6	"	"	Homework set #2
Sept. 7	W	7	Enzymes, Introduction to Catabolism and Anabolism Overview	Chapter 9	
Sept. 9	F	8	Evolution of Metabolic Diversity	Chapter 10	No Homework
Sept. 12	M	9	"	"	
Sept. 13	**T**		**Exam #1 (7-9 pm in AG 5030)**		
Sept. 14	W	10	"	"	
Sept. 16	F	11	"	"	Homework set #3
Sept. 19	M		Anabolism	Chapter 11 (ONLY pp. 265-268)	*Poster presentation: hypothesis*
Sept. 21	W	12	Macromolecular Structure/Function	Chapter 12 (excepting pp. 289-291)	
Sept. 23	F	13	"	"	Homework set #4
Sept. 26	M	14	Regulation of Gene Expression	Chapter 13 (excepting pp. 340-348 and 357-360)	
Sept. 28	W	15	Bacterial Genetics	Chapter 14 (excepting pp. 372-375)	
Sept. 30	F	16	"	"	Homework set #5
Oct. 3	M	17	Principles of Genetic Engineering	Chapter 15 (ONLY pp. 404-405 and 412-416)	
Oct. 5	W	18	"	"	
Oct. 7	F	19	Antibiotics	Chapter 34	Homework set #6
Oct. 10	M	20	Viruses	Chapter 5 & 25 (excepting pp. 623-631 and pp. 633-634)	
Oct. 12	W		"	"	
Oct. 14	F	21	Taxonomic Approaches to Classification and Identification	Chapter 17	No Homework

Oct. 17	M		"	"	
Oct. 18	**T**		**Exam #2 (7-9 pm in AG 5030)**		
Oct. 19	W	22	*Archaea*	Chapter 18	
Oct. 21	F		"	"	Homework set #7
Oct. 24	M	23	*Bacteria*	Chapters 19-22 (selections as covered in lecture)	
Oct. 26	W	24	"	Chapter 28 (ONLY pp. 677-679)	*Vodcasted Lectures: Oct. 26 and 28*
Oct. 28	F		"	"	Homework set #8
Oct. 31	M	25	Eucaryotic Microorganisms	Chapter 23 and 24	*Poster Presentation: Abstract*
Nov. 2	W		"	"	
Nov. 4	F	26	Microbial Ecology: Habitats	Chapter 26 and 27 (selections as covered in lecture)	No Homework
Nov. 7	M		Microbial Ecology: Biogeochemical cycles	"	*Poster Presentation: Poster Draft*
Nov. 8	**T**		**Exam #3 (7-9 pm in AG 5030)**		
Nov. 9	W		"	"	
Nov. 11	F		Microbial Ecology: Symbiotic Associations	Chapter 29-30 (selections as covered in lecture)	Homework set #9
Nov. 14	M		Food Microbiology	Chapter 40 (selections as covered in lab)	*Post-test and Knowledge Survey*
Nov. 16	W		Environmental Microbiology	Chapter 29 and 30 (selections as covered in lab)	
Nov. 18	F	27	Principles of Infectious Disease and Epidemiology	Chapter 36 (selections as covered in lecture)	Homework set #10
Nov. 21	M	28	Microbial Mechanisms of Pathogenicity	Chapter 31 (selections as covered in lecture)	
Nov. 21	**M**		**Final Exam Distributed (Due Friday, Dec. 2nd)**		No Homework
Nov. 28	M	29	Nonspecific Host Defense Systems	Chapter 32	
Nov. 30	W	30	Specific Host Defense Systems	Chapter 33	
Dec. 2	F	31	Immunologic Disorders	"	No Homework
FINAL EXAM: Wednesday, Dec. 7 (10:15 am - 12:15 pm)				*Poster presentation:*	*AS/MB foyer*