Microbiology (BioSc221)

Instructor
Dr. Dave Westenberg
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Course Webpage - All material in this syllabus plus supplemental lecture material can be found at the following URL: http://www.mst.edu/~microbio/Bio221.html and on the course Blackboard site.

Textbook. (The following book is required for all students)

Microbial Life 2nd Edition. By Staley, Gunsalus, Lory and Perry

Course Goals.
(Adapted from the American Society for Microbiology Curriculum Recommendations)

Define and use microbiological terms.
Describe the principles applied in culturing and characterizing microorganisms.
Distinguish diverse microorganisms according to their physiological characteristic.
Explain the role of microbes in the evolution of life on earth.
Develop an awareness of the impact that microbes have on the biosphere and humans.
Describe the role of microbiology in biotechnology.
Learn to say "Microbes Rule"☺

Disability Support Services: *http://dss.mst.edu Any student inquiring about academic accommodations because of a disability should be referred to Disability Support Services so that appropriate and reasonable accommodative services can be determined and recommended. DSS is located in 204 Norwood Hall (341-4211, dss@mst.edu) "If you have a documented disability and anticipate needing accommodations in this course, you are strongly encouraged to meet with me early in the semester. You will need to request that the Disability Services staff send a letter to me verifying your disability and specifying the accommodation you will need before I can arrange your accommodation."*

Academic Dishonesty: *http://registrar.mst.edu/academicregs/index.html Page 30 of the Student Academic Regulations handbook describes the student standard of conduct relative to the System's Collected Rules and Regulations section 200.010, and offers descriptions of academic dishonesty including cheating, plagiarism or sabotage. Additional guidance for faculty, including a description of the process for dealing with issues related to academic dishonesty, is available on-line at http://ugs.mst.edu .*

If you have any comments or concerns regarding this course or either instructor (good or bad) please feel free to discuss them with us. If you are not satisfied with our response or prefer to speak with someone else, you may contact the Chair of the Biology Department, Dr. Robert Aronstam (aronstam@mst.edu, 341-4819) or the Vice-Provost for Undergraduate Studies, Dr. Harvest Collier (hcollier@mst.edu, 341-4390).

Examinations and Grading: The course will be worth a total of 750 points. There will be 4 exams of equal value (100 points each - 400 points total). (See the schedule for exam dates). 25 points of your exam grade will come from accurate completion of study questions which are to be turned in on the day of the exam). The fourth exam will be during the final exam period and will not be comprehensive. There will be no make-up exams during the semester. If you miss an exam for a legitimate reason it may be possible to take a make-up exam during the final exam period. The make-up exam will be a comprehensive exam. There will be weekly quizzes during the semester. The best 10 scores will count towards your final grade (100 points total). 50 points will come from contributing news items and participating in online discussions. 50 points will come from based homework assignments. 50 points will come from a "Microbe of the Week" report. 50 points will come from class participation, mainly in the form of clicker questions. 50 points will come from additional homework assignments.

Clickers. Each student must have a personal response device (clicker) for answering daily questions during class time. Clicker questions will be based on material from the previous class meeting, questions posed by the instructor during class and assigned readings. (50 points)

Microbes in the News. Each student must contribute at least two news articles which are to be posted on Blackboard. Articles are to be from the popular press (newspapers, magazines, etc.) only one article can be from Science News or other science magazines. Provide your own thoughts or comments on the article and everyone else contribute to the discussion. Each student must contribute to news discussions at least four times throughout the year. (25 points)

Discussion Participation. Each student must contribute at least two discussion topics on the course blackboard site and participate in discussions at least four times throughout the year (more discussion is strongly encouraged). Students should post their thoughts, opinions or questions on any current topic being presented in the course. Questions and comments will be posted by the instructor to stimulate discussion. (25 points)

ATCC Homework During the semester, each student will be given homework assignments to find information on microorganisms. This will focus on microorganism available through the American Type Culture Collection (ATCC). Throughout the first few weeks of the semester each student will use various resources to collect information on their assigned organism. You will be expected to post your sources (with links if appropriate) on the course Blackboard site and comment on the usefulness of the source. If someone has already posted your source, then add your comments to the discussion. (50 points)

Microbe of the “Week". Students will choose an unusual organism and write a report on that organism. During the first 1/4 of the semester, you will be introduced to various resources for information on microorganisms. After the second exam, you will choose your organism and write a report on the information you have learned about the organism. Your report is to be posted on the course Blackboard site for other students to read and offer comments. As you search resources, post information on your search process on Blackboard. Tell your fellow students about resources you have found as you try and decide on a microbe and gather information about your organism. Let them know if you found the resources to be useful or not useful and why. Throughout the semester, the instructor will select microbes during class. Be prepared to BRIEFLY say something about your organism such as why you chose it or what made it interesting to you. (50 points)

Additional Homework assignments (50 points)

Microbiology Course Deadlines
(By topic)

Exams

Monday 2/9	Exam 1
Friday 3/6	Exam 2
Monday 4/13	Exam 3
Friday 5/15	Exam 4 (1:30 – 3:30)

Quizzes

Every week (Quizzes will open after class on Monday and close at beginning of Wednesday's class.

Website postings

By Monday 2/9 Post on information sources and add comments on sources reported by others.
By Friday 3/6 post one popular press news article and respond to two other news articles.
By Friday 3/6 post one microbiology related question and respond to two other questions.
By Friday 5/8 post one popular press news article and respond to two other news articles.
By Friday 5/8 post one microbiology related question and respond to two other questions.

ATCC Microorganism reports

By Wednesday 1/21 ATCC organism data
By Wednesday 1/28 ATCC organism research articles
By Wednesday 2/4 ATCC organism descriptive paragraph
By Friday 4/1 ATCC Genome homework
By Friday 5/1 ATCC organism connections (May be submitted at any time throughout the course)

Microbe of the Week

By Wednesday, 2/11 select Microbe of the Week
By Monday, 2/16 submit Microbe of the Week report

Additional assignments

By Friday 1/16 History of Microbiology
By Wednesday 3/18 Phylogenetic tree
By Friday 3/20 Organism names
By Friday 5/1Tree of life homework

Microbiology Course Deadlines
(By date)

By Friday 1/16	History of Microbiology
By Wed 1/21	ATCC organism data
By Wed 1/28	ATCC organism research articles
By Wed 2/4	ATCC organism descriptive paragraph
By Monday 2/9	Post on information sources and add comments on sources reported by others.
Monday 2/9	**Exam 1**
By Wed 2/11	select Microbe of the Week
By Monday, 2/16	submit Microbe of the Week report
By Friday 3/6	post one popular press news article and respond to two other news articles.
By Friday 3/6	post one microbiology related question and respond to two other questions.
Friday 3/6	**Exam 2**
By Wed 3/18	Phylogenetic tree
By Friday 3/20	Organism names
By Friday 4/1	ATCC Genome homework
Monday 4/13	**Exam 3**
By Friday 5/1	ATCC organism connections (May be submitted at any time throughout the course)
By Friday 5/1	Tree of life homework
By Friday 5/8	post one popular press news article and respond to two other news articles.
By Friday 5/8	post one microbiology related question and respond to two other questions.
Friday 5/15	**Exam 4 (1:30 – 3:30)**

Quizzes

Every week (Quizzes will open after class on Monday and close at beginning of Wednesday's class.

Lecture Topics.

Course topics and their corresponding pages are presented below. You will be expected to have read the appropriate material prior to the coverage of each topic. All material in the book may not be covered in lecture but you will be responsible for having read all the material.

The following list of lecture topics is a guideline and is subject to change.

Topic	**Section in Microbial Life**
Introduction – Planet of the Microbes	Chapter 1
History of microbiology	Chapter 2
Microbial structure - Microscopy	Chapter 4
Microbial structure - Membranes, Walls, Capsules	Chapter 4
Culturing microbes - Enrichment, Isolation	Chapter 5
Microbial growth - Counting microbes	Chapter 6
Microbial growth - Environmental parameters	Chapter 6
Controlling Microbial Growth	Chapter 7
Monday 2/9 Exam 1	
Metabolism - Fermentation	Chapter 8
Metabolism - Respiration	Chapter 8
Metabolism - Photosynthesis	Chapter 9
Biosynthesis - From “fixed” carbon	Chapter 10
Biosynthesis - From CO_2	Chapter 10
Biosynthesis - Assimilation of other elements	Chapter 10
Assembly of Bacterial Cell Structures	Chapter 11
Microbial Biodegradation	Chapter 12
Microbial Ecology	Chapter 24
Industrial Microbiology	Chapter 31
Environmental Microbiology	Chapter 32
Friday 3/6 Exam 2	
Microbial Genetics - Regulation of transcription	Chapter 13
Genetic Exchange - Extrachromosomal Elements	Chapter 15
Microbial Genomics - Recombinant DNA	Chapter 16
Microbial Genomics - Whole Genome Analysis	Chapter 16
Prokaryotic Taxonomy - Sequence Analysis Tools	Chapter 17
Viruses - Basic features, Bacteriophages	Chapter 14
Viruses - Animal and Plant Viruses	Chapter 14
Eukaryotic Microbes (Protozoa)	Chapter 23
Eukaryotic Microbes (Algae)	Chapter 23
Eukaryotic Microbes (Fungi)	Chapter 23
Monday 4/13 Exam 3	
Symbiotic Associations (Microbe-Plant)	Chapter 25
Symbiotic Associations (Microbe-Animal)	Chapter 25
Human-Microbe Interaction - Normal Flora	Chapter 26
Human-Microbe Interaction - Pathogenesis	Chapter 26
Immunology - Innate vs. Adaptive Immunity	Chapter 27
Immunology - Vaccine	Chapter 27
Microbial Diseases - Selected Examples	Chapter 28
Epidemiology	Chapter 30
Friday 5/15 Exam 4	**1:30 – 3:30**