

GENERAL MICROBIOLOGY

MMBB 250

Fall 2013

Course Outline

INSTRUCTOR:

Dr. Eva M. Top, Life Sciences South 258
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LECTURE TIME AND PLACE: Monday/Wednesday/Friday, 9:30am-10:20 am, 112 Renfrew Hall.

OFFICE HOURS:

Mondays and Wednesdays 10:30am-11:20am. If you cannot make these hours, you can also make an appointment by contacting me via email or at the end of class.

LECTURE TEXT and WEBSITE:

The textbook edition available for you in the UI Bookstore is called 'The Pearson Custom Library for the Biological Sciences. Brock Biology of Microorganisms, University of Idaho'. ISBN-13: 978-1-269-24801-3; ISBN-10: 1-269-24801-4.

The content is the same as the original textbook:

'Brock Biology of Microorganisms, 13th ed.' (Madigan, Martinko, Stahl, Clark, 2012). ISBN-13: 978-0-321-64963-8, ISBN-10: 0-321-64963-X.

OR check out: http://www.coursesmart.com/IR/5629894/9780321726742?__hdv=6.8

The course website is administered through BbLearn and will provide access to powerpoint presentations and grades. All students who are enrolled in MMBB250 should have access.

SYLLABUS:

This syllabus is advisory, not exhaustive. Details may change, and probably will. Other materials and information about the course will be posted regularly.

LABORATORY MMBB255:

The lab is separate from this class, and taught by T. Steffens, Life Science 167 phone: 885-8953, e-mail: TimS@uidaho.edu. Many of the concepts learned here will be applied and tested in the lab.

COURSE OBJECTIVES:

The primary objective of this General Microbiology course is to provide a survey of the biology of microorganisms, with an emphasis on the domain Bacteria. This is an exciting time for Microbiology as the recent development of new methods have allowed us to learn much more about the diversity and functions of these fascinating tiny organisms. Microorganisms are essential for human life on this planet, yet they can also be our enemies as they are the cause of numerous diseases. Understanding the positive and negative roles of microorganisms in our lives requires basic understanding of who they are and what they do.

Learning outcomes:

By the end of this course, students will be able to

1. Understand the structure, function, physiology, and diversity of Bacteria, Archaea, Fungi, and viruses;
2. Have a basic understanding of the genetics and genomics of microorganisms;
3. Explain the roles of microorganisms in our environment;
4. Explain the roles of microorganisms in human health.

EXAMS:

There will be three lecture exams and a cumulative final. Total course points 500: 100 pts for each lecture exam and 200 for the final exam. Grading will be on a strict percentile basis (no curve).

Grade cut offs:

A = 90%
B = 80%
C = 70%
D = 60%
F < 60%

Make-up exams will only be allowed in the case of excused absence on the scheduled time of the regular exam. Excused absences are those that result from situations beyond the control of the student. These include (but are not limited to) personal illness, serious family illness or death, delayed flights, and sanctioned University events (e.g. athletics). Excused absences require some formal documentation such as a doctor's note, email from a coach, proof of travel delay, etc.

Unexcused absences are those that are preventable by the student or are recreational in nature. These include (but are not limited to) oversleeping, forgetting to come to class, attending family functions (weddings, family trips, ...), scheduling flights home while school is still in session, and personal leave days. Exams on days for which you have an unexcused absence CANNOT be made up and points are forfeited.

If you have a legitimate conflict with an exam date/time, you must let the instructor know prior to the week of the exam to make arrangements for a makeup exam. Exam dates are firm - please make your plans accordingly. Missed exams cannot be made up without prior instructor approval. If you have more than two final exams scheduled on the same day as our final you may be eligible to re-schedule, but you must inform the instructor no later than November 30.

Final Exam: Tuesday December 17, 2013 @ 10:00am – 12:00pm

NOTE: The final exam will not be re-scheduled to accommodate early flights home. Make your Christmas break plans accordingly.

Review sessions: Prior to examinations review sessions will be held if there is interest. Time and place will be announced.

PREPARATION, ATTENDANCE AND STUDENT CONDUCT:

Reading assigned material in advance and attending class is highly recommended, as Powerpoint slides will not contain all information necessary to do well on all tests. Chemistry classes Chem 101 OR Chem 111 are a prerequisite for this course. Introductory Biochemistry (Biol 380) or Survey of Biochemistry (Biol 300), and Organic Chemistry (Chem 277) or Carbon Compounds (Chem 275), will help you in this course.

In the classroom, respect for one another and for the instructor is essential for an effective learning environment. Any behavior that is disruptive to the class, or deemed by the instructor to be disrespectful to fellow students or the instructor, will not be tolerated. You are expected to show respect to your classmates and instructor by listening when others are speaking, and not belittling the opinions of others, even when you disagree. Behavior intended to embarrass or ridicule others will not be tolerated and will have serious consequences. Respect also means no side conversations with fellow students, NO texting or inappropriate laptop or tablet use (e.g., surfing the web), no sleeping in class, and so on. Students that violate this rule may be summarily dismissed from class, and repeated violation may result in expulsion from the course with the student receiving a failing grade.

Use of laptop computers and other electronic devices during lectures for purposes other than the class will not be tolerated. Cell phones and similar devices must be turned off during class. Disruption of class by ringing cell phones may result in the loss of points.

See also the [University of Idaho Classroom Learning Civility Clause](#) footnote

As your instructor, I will do my best to communicate the principles and concepts of general microbiology to you. If you have concerns about the way materials are being presented, or do not understand concepts being presented, or have comments about presentation format or content, please talk to me or email me, and I will endeavor to make things clearer. Alternatively, we could discuss matters during office hours or during other appointments. Please do not be shy: this is your education and your future. Care enough to meet me half way and I will try to do the same.

ACADEMIC HONESTY:

Academic honesty is governed by Article II of the University of Idaho's Student Code of Conduct (<http://www.webpages.uidaho.edu/fsh/2300.html>). All students are expected to uphold the highest standards of academic honesty. Academic dishonesty includes but is not limited to cheating on examinations, plagiarism, falsification of academic or other records, and the acquisition or use of test materials without faculty authorization. Students are reminded that examinations are to reflect their own work and knowledge. All incidents of academic dishonesty will be reported to the dean of students. Individuals guilty of academic dishonesty will receive a failing grade. Even one incident of academic dishonesty may also merit expulsion from the University.

ACADEMIC ACCOMMODATIONS:

*All students are expected to meet the standards for this course as set by the instructor. Reasonable accommodations are available for students who have documented temporary or permanent disabilities. These students should discuss options with the University Disability Support Services during the first two weeks of class (located in the Idaho Commons Building, Room 306, e-mail: dss@uidaho.edu, phone: (208) 885-6307). The DSS will contact professors with suggested classroom needs and accommodations. Approved documentation needs to be on file in the DSS prior to the requested accommodations. See <http://www.uidaho.edu/studentaffairs/asap/dss>.

OPPORTUNITIES FOR UNDERGRADUATE RESEARCH:

I encourage students who are interested in microbiology research, to participate in undergraduate research in one of the laboratories on campus. More information will be provided in class. Examples of strong undergraduate research programs administered through the University of Idaho are "INBRE", funded by the National Institutes of Health is (<http://www.sci.uidaho.edu/inbre/>), and UBM (Undergraduate Biology & Mathematics), funded by the National Science Foundation, for those of you with an interest in biology and mathematics. These programs are very competitive and provide summer stipends. Do not hesitate to ask me for more information.

University of Idaho Classroom Learning Civility Clause:

In any environment in which people gather to learn, it is essential that all members feel as free and safe as possible in their participation. To this end, it is expected that everyone in this course will be treated with mutual respect and civility, with an understanding that all of us (students, instructors, professors, guests, and teaching assistants) will be respectful and civil to one another in discussion, in action, in teaching, and in learning. Should you feel our classroom interactions do not reflect an environment of civility and respect, you are encouraged to meet with your instructor during office hours to discuss your concern. Additional resources for expression of concern or requesting support include the Dean of Students office and staff (5-6757), the UI Counseling & Testing Center's confidential services (5-6716), or the UI Office of Human Rights, Access, & Inclusion (5-4285).

APPROXIMATE LECTURE SCHEDULE (tentative, flexible and highly optimistic):

- August 26, 2013 (M): Introduction to Microbiology
Reading Assignment: Chapter 1.
- August 28 (W): Historical Perspective
Reading Assignment: Chapter 1, continued.
- August 30 (F): A Brief Journey through the Microbial World
Reading Assignment: Chapter 2.
- September 2 (M): Labor Day: No classes
- September 4 (W): Prokaryotic Cell Structure and Function: Cell Shape and Size; Cytoplasmic Membrane and Transport.
Reading Assignment: Chapter 3.
- September 6 (F): Cell Structure/Function – continued: Cell Walls of Prokaryotes
Reading Assignment: Chapter 3, continued.
- September 9 (M): Cell Structure/Function – continued: Other Structures, Locomotion
Microbial Growth
Reading Assignment: Chapter 3, continued.
- September 11 (W): Microbial Growth
Reading Assignment: Chapter 5.
- September 13 (F): Microbial Growth, continued
Reading Assignment: Chapter 5, continued.
- September 16 (M): Nutrition, Culture and Metabolism of Microorganisms
Reading Assignment: Chapter 4.
- September 18 (W): Nutrition, Culture and Metabolism, continued
Reading Assignment: Chapter 4, continued
- September 20 (F): Nutrition, Culture and Metabolism, continued
Reading Assignment: Chapter 4, continued.
- September 23 (M): Examination I (Monday!)**
- September 25 (W): Molecular Biology of Bacteria
DNA structure, Chromosomes and Plasmids
Reading Assignment: Chapter 6.
- September 27 (F): Molecular Biology of Bacteria
DNA replication
Reading Assignment: Chapter 6, continued.

- September 30 (M): Molecular Biology of Bacteria
DNA replication, continued, PCR, DNA sequencing
- October 2 (W): Molecular Biology of Bacteria: Transcription
Reading Assignment: Chapter 6, continued.
- October 4 (F): Molecular Biology of Bacteria: Translation
Reading Assignment: Chapter 6, continued.
- October 7 (M): Archaeal and Eukaryotic Molecular Biology
Reading Assignment: Chapter 7.
- October 9 (W): Archaeal and Eukaryotic Molecular Biology, continued
Reading Assignment: Chapter 7, continued.
- October 11 (F): Regulation of Gene Expression
Reading Assignment: Chapter 8.
- October 14 (M): Regulation of Gene Expression, continued
Reading Assignment: Chapter 8, continued.
- October 16 (W): Genetics of Bacteria and Archaea
Reading Assignment: Chapter 10.
- October 18 (F): Examination II (Friday!)**
- October 21 (M): Genetics of Bacteria and Archaea, continued.
Reading Assignment: Chapter 10, continued.
- October 23 (W): Genetics – continued / Genetic Engineering
Reading Assignment: Excerpts of Chapter 11
- October 25 (F): Microbial Genomics
Assignment: Excerpts of Chapters 12.
- October 28 (M): Microbial Evolution and Systematics
Reading Assignment: Chapter 16.
- October 30 (W): Microbial Evolution and Systematics, continued
Reading Assignment: Chapter 16, continued.
- November 1 (F): Metabolic Diversity
Reading Assignment: Excerpts of Chapters 13 (+ 17,18).
- November 4 (M): Metabolic Diversity/ Catabolism – continued
Reading Assignment: Excerpts of Chapters 13, 14 (+ 17,18).
- November 6 (W): Prokaryotic Diversity - Summary of Proteobacteria, Gram positives and others
Reading Assignment: Chapter 18.
- November 8 (F): Diversity of Archaea
Reading Assignment: Chapter 19.

- November 11 (M): Eukaryotic Microorganisms
Reading Assignment: Chapter 20.
- November 13 (W): Viral Diversity
Reading Assignment: Chapter 21
- November 15 (F): Microbial Ecology
Reading Assignment: Chapter 23.
- November 18 (M): Microbial Ecology, continued
Reading Assignment: Excerpts of Chapter 24.
- November 20 (W): Microbial Symbioses and The Human Microbiome
Reading Assignment: Excerpts from Chapters 25.
- November 22 (F): Examination III (Friday!)**
- November 25-29: Thanksgivings Break**
- December 2 (M): Host-Microbe interactions / Immunology
Reading Assignment: Excerpts from Chapters 27/28.
- December 4 (W): Microbial pathogenesis / Antimicrobial Agents/ Diagnostics
Reading Assignment: Excerpts from Chapters 26/27/31
- December 6 (F): Human and Animal transmitted Infectious Diseases
Reading Assignment: Excerpts from Chapters 33/34.
- December 9 (M): Waterborne and Foodborne Microbial Diseases, Treatment and Preservation
Reading Assignment: Excerpts from Chapters 35/36.
- December 11 (W): Applied and Industrial Microbiology, Biotechnology
Reading Assignment: Excerpts from Chapter 15.
- December 13 (F): Catching up, Conclusions

TUESDAY December 17: Final Examination 10:00am-12:00pm, 112 Renfrew!