Biology 2900, Microbiology in Health and Disease, 4 credits, Dept. of Biology, Valdosta State University
Spring2011 Syllabus

Instructor: Dr. Archna Bhasin
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Office: 2093 Bailey Science Center
Office hours: 12:00-12:50pm MWF or by appointment (please make appointments via e-mail)
Class: MWF 11:00-11:50am Bailey Science Center Rm. 1024
Laboratory: Section A (CRN 21199) – MW 1:00pm-2:25pm - Bailey Science Center Rm. 2068
Section B (CRN 21200) – MW 3:00-4:25pm – Bailey Science Center Rm. 2068

Course description: An introductory microbiology course with emphasis upon the role played by microorganisms in health and disease. Open to students who plan to enter the health or allied health fields without a major in biology. Two 1.5 hour laboratory periods per week.
Corequisites: Chem 1152K

Required texts (all available at the bookstore):

1.) **Microbiology: A Human Perspective, sixth edition**
by Nester, Anderson, Roberts and Nester
McGraw Hill 2009
2.) **Benson's Microbiological Applications, short version, eleventh edition**
by Alfred E. Brown
McGraw Hill 2009
3.) **The Coming Plague: Newly Emerging Diseases in a World out of Balance**
by Laurie Garrett
Farrar, Straus and Giroux 1994

Course Objectives*:*

The objective of this course is to give you a foundation in microbiological concepts as they pertain to health and disease, as well as the laboratory skills required to work in the fields of professional health. This course will focus on concepts and critical thinking skills with emphasis on the scientific method. Supplementary scientific readings (both primary articles and reviews), a lab report and an oral presentation will be assigned in order to improve your critical thinking and communication (oral and written) abilities. In addition, at the end of this course, you should

1.) **have an appreciation for the ubiquity (they're everywhere) and diversity of microbes.**
2.) **be able to apply your knowledge of microorganisms to real-life situations – here's where critical thinking is used.**
3.) **be able to evaluate scientific reports and distinguish between various types of scientific literature (newspapers, popular magazines, reviews and primary sources).**
4.) **be able to communicate scientific concepts/ideas clearly through oral and written reports.**
5.) **be competent in aseptic technique.**

These objectives support the Department of Biology Educational Outcome #3 and VSU General Educational Outcomes #5.

Grading and assignments: In addition to the exams, lab quizzes, a lab report and the oral presentation, I will be giving short graded quizzes and homework assignments throughout lab and lecture. The purpose of the homework and quizzes is to motivate you to come to lab prepared, as well as to motivate you to study regularly. Lab participation points will come from lab attendance (see

attendance policy below). Lecture exams will cover lecture material and will primarily be short answer format. In addition, lecture exams will have a comprehensive component, meaning that these exams will have content that was covered on previous exams. I will do this in order to insure that you learn key concepts that you may have missed previously. Lab exam I will cover the first half of the laboratory material, while lab exam II will cover the second half. **There will be absolutely no make-up labs nor quizzes! Make-up exams and presentations are seriously discouraged and are given upon the instructor's discretion; a family emergency or a valid reason (for example, an athletic event) is required. If you know that you will not be able to take an exam on the scheduled day, be sure to talk to me *before* the exam day and not after the exam**. **If you have a family emergency or a medical excuse, please come talk to me as soon as possible and we will work something out.**

Lecture Exam I (F2/11)	**150 pts**	**Grading scale:**
Lecture Exam II (F3/11)	**150 pts**	**900-1000 pts = A**
Lecture Exam III (F4/11)	**150 pts**	**800-899 pts = B**
Lecture Exam IV (F5/6)	**150 pts**	**700-799 pts = C**
Lab exam I (TBA)	**50 pts**	**600-699 pts = D**
Lab exam II (M5/2)	**50 pts**	**< 600 pts = F**
Unknown I.D. Lab report (TBA)	**50 pts**	
Homework and quizzes (TBA)	**75 pts**	
Oral presentation (TBD)	**75 pts**	
Lab participation	**100 pts**	
Total	**1000pts**	

Attendance and tardiness:
In order to do well in this class, you need to come to class! This is not a straight lecture/textbook-based course so you will miss a lot of material and learning opportunities if you do not come to class. In particular, you must attend all of the laboratory (including oral reports) sessions. The lab/oral report sessions are vital to your understanding of the material. **You will get only one free absence, and you will lose 10 pts for each additional lab session missed. More than six absences will result in failure of the course. If you come to all the lab sessions, you will receive 10 bonus points.** In addition, since you have limited time during the laboratory sessions, **you need to be on time for the lab sessions!**

Late assignments:
All assignments need to be in my office by 5pm on the due date. Late assignments will generally not be accepted.
Cheating/plagiarism:
Cheating and plagiarism will absolutely not be tolerated! Although you will be doing work in groups and with a lab partner, **you must write-up your work in your own words**; this is the only way to assess your learning. If I get two lab reports that look identical or nearly identical, both parties will fail the assignment. You must also be diligent in citing all of your references, including websites. **Paraphrasing does not mean changing a word or two**; if you are taking the bulk of someone else's words, you must quote them. The best way to ensure that you do not plagiarize is to read the material, then step away from it for a day or two, and then begin writing. This method also allows you to gauge your understanding of the material. Further information on the Biology Department Plagiarism Policy can be found on the Biology website.

Classroom/Laboratory conduct:
Turn off your cellphones and be respectful of others! In addition, lab aprons will be provided and must be worn during the lab. Sandals, flip-flops and other open shoes are not permitted in the lab.

Accomodations Statement:
" Valdosta State University complies fully with the requirements of the Americans with Disabilities Act (ADA). If you believe that you are covered under this act, and if you have need for special arrangements to allow you to meet the requirements of this course, please contact the Access Office for Students with Disabilities in Nevins Hall, 245-2498. Also, please discuss this need with the instructor at the time of the first class."-from the Academic Affairs webpage

This is a tentative schedule; changes will be announced in class. Due dates will be announced in class, email. Please check your email.

Date	topic	Reading assignments **(please read before coming to class**
M1/10	Intro/class goals	
M1/10lab	Lab intro, Microbial Universe video	
W1/12	History and overview	Textbook Ch.1
W1/12lab	Lab safety, biosafety levels, hand-washing	Lab manual ix, Ex.35, supplement
F1/14	History and overview	Textbook Ch.1
M1/17	MLK Holiday – no classes	
W1/19 and F1/21	class cancelled, read Ch. 20 Epidemiology and Ch. 4 "Into the Woods" from L. Garrett's "The Coming Plague" on your own	**Textbook Ch.20 Epidemiology, Ch.4 "Into the Woods" of Plague" (hmwk due M1/24)**
M1/24	discuss "Into the Woods", start macromolecules	Textbook Ch.20 Epidemiology, Ch.4 "Into the Woods" of L. G Plague" (hmwk due today)
M1/24lab	Microscope rules, pondwater	Lab Manual Ex. 1, 5
W1/26	Macromolecules	Textbook Ch. 2
W1/26lab	pondwater microscopy, aseptic technique, nutrient broth inoculation	Lab manual Ex.1, 5, 6, 8
F1/28	Eukaryotic microbes	Textbook Ch.12, Ch.21.7-21.8
M1/31	More eukaryotic microbes	Textbook Ch.12, Ch.21.7-21.8
M1/31lab	Streak plate from broth onto Maconkey agar, **simple stain of teeth and gums (hand-in drawing)**	Lab manual Ex. 8, 9, 10, 11
W2/2	Prokaryote cell structure	Textbook Ch.3
W2/2lab	Fungal culture, re-streak onto Maconkey, fluid thioglycollate, **mixture of**	Lab manual Ex. 7, 8, 9

	yeast and bacteria wet mount (hand-in drawing)	
F2/4	Prokaryote cell structure	Textbook Ch.3
M2/7	Prokaryotic growth	Textbook Ch.4
M2/7lab	Mold microscopy, re-streak onto nutrient agar	Lab Ex. 7, 8, 9
W2/9	Prokaryotic growth	Textbook Ch.4
W2/9lab	Stock unknowns onto nutrient agar, gram-staining	Lab Ex. 7, 8, 9, 10,14
F2/11	**Exam I**	
M2/14	Dilutions chalk talk – **attendance is advised**	Textbook Ch. 4.8
M2/14lab	Gram-staining, phenylethyl alcohol (PEA) and desoxycholate (DES) plates	Lab Ex. 10,14, supplement
W2/16	Metabolism	Textbook Ch.4.5-4.7, Ch. 6, 11.1, 11.5, 11.8
W2/16lab	Endospore staining, UV lab, PEA and DES cont.	Lab Ex. 10, 15, 30, supplement
F2/18	More metabolism	Textbook Ch.4.5-4.7, Ch. 6, 11.1, 11.5, 11.8
M2/21	More metabolism	Textbook Ch.4.5-4.7, Ch. 6, 11.1, 11.5, 11.8
M2/21lab	UV lab cont., acid-fast staining	Lab Ex. 10, 16, 30
W2/23	Metabolism cont.	Textbook Ch.4.5-4.7, Ch. 6, 11.1, 11.5, 11.8
W2/23lab	Dilution plating of food	Lab supplement
F2/25	Virology	Textbook Ch. 13, 14
M2/28	Virology cont.	Textbook Ch. 13, 14
M2/28lab	Finish food counts, begin I.D. enviro unknown	Lab supplement, Lab Ex.38 (oxidative/fermentative reactions Lab Ex.19,37 (thioglycollate media, growth characteristics)
W3/2	Virology	Textbook Ch. 22.4(cold), 22.6 (flu), 25.6 (hepatitis), 25.4 (he 27.6 (TSE), Ch.29 (HIV)
W3/2lab	I.D. enviro unknown cont.	Read Lab Ex.19, 37,38 results – clearly and thoroughly

F3/4	Virology	Textbook Ch. 22.4(cold), 22.6 (flu), 25.6 (hepatitis), 25.4 (he 27.6 (TSE), Ch.29 (HIV)
M3/7	Virology cont.	Textbook Ch. 22.4(cold), 22.6 (flu), 25.6 (hepatitis), 25.4 (he 27.6 (TSE), Ch.29 (HIV)
M3/7lab	I.D. enviro unknown and blood agar (*Streptococci*)	Lab Ex.39/40 (hydrolytic/degradative reactions), Lab Ex. 17
W3/9	Virology cont.	Textbook Ch. 22.4(cold), 22.6 (flu), 25.6 (hepatitis), 25.4 (he 27.6 (TSE), Ch.29 (HIV)
W3/9lab	I.D. enviro unknown cont.	Read Lab Ex. 39, 40, 17 results – record clearly and thoroug
F3/11	**Exam II**	
M3/14-3/18	Classes cancelled – Spring Break	
M3/21	Innate immunity	Textbook Ch.15
M3/21lab	Plaque assay, “And the Band Played On” movie	Lab supplement, Ex. 23, movie
W3/23	Innate immunity	Textbook Ch. 15
W3/23lab	Plaque assay cont., “And the Band Played On” movie	Lab supplement, Ex. 23, movie
F3/25	Adaptive immunity	Textbook Ch. 16
M3/28	Adaptive immunity	Textbook Ch.16
M3/28lab	Finish movie, begin *S. aureus* and urinalysis labs (streak plates)	Lab supplements, Ex. 52, 43
W3/30	Adaptive immunity	Textbook Ch.16
W3/30lab	Genomic DNA prep, *S. aureus* (streak onto TSA) and urinalysis labs (inoculate enterotube) cont.	Lab supplements, Ex. 52, 43
F4/1	Class cancelled	
M4/4	Adaptive immunity	Textbook Ch. 16
M4/4lab	*S. aureus* (latex agglutination) and urinalysis labs (enterotube) cont., Effectiveness of antibiotics, disinfectants and alcohol	Lab supplements, Ex. 52, 43, 32, 33, 34

W4/6 W4/6lab F4/8	Applications of immunology Effectiveness of antibiotics, disinfectants and alcohol cont., run genomic DNA gel Host-Microbe Interactions	Textbook Ch. 19 Lab ex. 32, 33, 34 Textbook Ch. 17
M4/11 M4/11lab W4/13 W4/13lab F4/15	**Exam III** **Oral presentations,** PCR Replication, PCR, sequencing **Oral presentations,** run PCR gel Transcription and translation	 Lab supplement Textbook Ch. 7, 9.6, 9.5 Textbook Ch. 7
M4/18 M4/18lab W4/20 W4/20lab F4/22	Mutations **Oral presentations,** selecting antibiotic resistant bacteria Horizontal gene transfer **Oral presentations** Horizontal gene transfer cont.	Textbook Ch. 8 Textbook Ch.8 Textbook Ch. 8
M4/25 M4/25lab W4/27lab F4/29	Antibiotics and antibiotic resistance **Oral presentations,** antibiotic-resistant bacteria cont. **Oral presentations** Antibiotics and antibiotic resistance	Textbook Ch. 21 Textbook Ch. 21
M5/2 **M5/2lab** **F5/6, 12:30-2:30pm**	Antibiotics and antibiotic resistance **Lab Exam II** **Exam IV**	Textbook Ch. 21

Tips for success:

1.) **Study, study, study!!!** For every class credit hour, you should be putting in 2-3 hrs per week studying, so you should study for this class 8-12 hours per week. So, if you are planning on working full-time and taking this class, it is likely that you will not do well.

2.) **Do not study superficially or merely for recognition. You need to study the material for recall, meaning that you're learning should be active not passive.** Reading alone is not sufficient. I recommend using drawings, concept maps, outlines, verbalizing concepts, working problems and the like. If you need help developing study skills, I recommend going to the Student Success Center.
3.) **You will need to see the material several times before it will sink in.** This is not easy material, especially since many of you limited background in biology and chemistry. I recommend reading the text before class, taking notes during class (the power-points do not substitute for note-taking), reviewing your notes after class and looking up confusing concepts immediately. I have also found that students who ask questions about the material immediately after class tend to do better.
4.) **Come to class!!!** Do not schedule work during class time. By registering for this class, you have made a commitment to coming to class. Even if lectures aren't your thing, learning the material will be much easier if you come to class. Also, I will give random, short quizzes during class which will go towards your participation points.
5.) **Please have your mind engaged during class and ask questions!** Physically being in class is not the same as mentally being in class. Typically, the students who do the best are the ones who ask questions. I give many opportunities during class for questions and I am open to interruptions so feel free to ask questions as simple as "Can you explain that again?" If you are not comfortable asking questions in class, come to my office hours or email me to make an appointment.
6.) **You also need to mentally engaged in lab!** Don't just go through the motions. Lab is there to help you understand the material, but you need to pay attention in lab. You also need to come prepared and read the lab manual before coming to class. You have to be prepared to make the mental connections between lab and lecture.
7.) **Come to lab on time and listen!** I give an explanation of the day's lab at the beginning of class and will not explain it repeatedly so you need to be at lab on time and ready to listen. Once you get started with lab, then you can talk all you want.
8.) **It is your responsibility to learn this material!!!** I can give you all the tools to learn this material, but I can't get in your head and make you learn it. As they say, "You can lead a horse to water, but you can't make it drink". Be pro-active!