MICROBIOLOGY 205
SPRING 2008 - 4/5 SEMESTER CREDITS

Instructor: Fernando P. Monroy, Ph.D.
Associate Professor
Department of Biological Sciences
RM 203 – Second Floor of Biological Sciences
Telephone: 523-0042
Email: *Fernando.Monroy@nau.edu*
Website: *http:/www2.nau.edu/~fpm/*

Lectures: 11:10 AM to 12:25 PM Tuesday and Thursday

Office Hours: Tu, Th – 9:30-10:30 PM
Other times by appointment

Location: Building 21, Room 256

Textbook: *Microbiology – A Systems Approach*, First edition, by Cowan and Talaro, McGraw Hill, 2005.

Course prerequisites: BIO 181

Required Laboratory Material: *Elements of Microbiology* by Richard Shand; "A Photographic Atlas of Microbiology", and "How to Write a Scientific Paper".

Nature of the course: The goal of this course is to teach an understanding of the language and concepts of microbiology and infectious disease. This understanding is important and useful to men and women in all fields. Emerging infectious diseases have become a dominant force and a real treat in our society, the course will address topics in this area. The course follows a sequence of development. Approximately 40% of the course will be devoted to basic microbiology including bacteria, viruses and eukaryotic microorganisms which cause infectious disease. We will first study the nature of microorganisms from the perspective of where microorganisms fit in life. The structure of prokaryotic and eukaryotic cells will be addressed. A "typical" prokaryotic cell and its component parts will be discussed. In each case, the function of the component will be related to its importance in infectious disease - for example, the selective action of antimicrobics, resistance to phagocytosis, development of vaccines or diagnosis of disease. Microbial genetics will be discussed in sufficient depth to understand the development and spread of antimicrobial resistance and, the emergence and re-emergence of infectious diseases. The principles of epidemiology, radiological health and the impact of the environment on infectious disease will be discussed in relation to their impact on infectious disease. The remainder of the course will concentrate on immunology, infectious diseases and the environmental context of microorganisms. The immune system, its role in the host-parasite relationship, and its importance in the prevention and treatment of infectious disease will be discussed. The organ system approach to infectious disease rather than the infectious agent approach will be emphasized in this section. The most important and interesting infectious agents and diseases will be emphasized. Case histories will be used to assist in a practical understanding of disease and in problem solving. The etiology, pathogenesis, epidemiology, treatment, prevention and control of infectious diseases will be discussed. The global impact of infectious disease will be addressed throughout the course. ***In general, lectures will emphasize more conceptually difficult material. For other material that is relevant but that it was covered in your previous***

BIO181 I will ask you to review it and learn it on your own by reading assigned pages from your textbook.

***Expectations of the Students*:**

1) Although there is a significant memorization component to this course, students will be tested on their problem solving abilities. Consequently students who simply memorize material in preparation for the examinations score much lower than students who actually understand the material and can apply what they know to problems that they have not seen before. Many exam questions will require not only that you have command of covered factual information, and understand it, but also be able to extrapolate material to situations not covered in class.
2) Students are expected to behave professionally at all times. For each hour you spend in lecture you will be expected to spend at least two hours in study and preparation outside the class. You will also spend time outside the laboratory writing lab reports, studying for quizzes, preparing for upcoming labs, etc.
3) Regular attendance is critical for success. It is recognized that absence from class is sometimes necessary. However, each student is accountable for all work missed due to any absence. The instructor is under no obligation to make special arrangements for students who have been absent. If you miss one class, you may be 1-2 chapters behind!!!!!
4) Students are expected to be on time and leave the classroom when the instructor indicates the class is over. After the first week of classes the instructor will close the front door 5 minutes into the lecture and students are expected to use to back door to gain access to the classroom. This is a matter of courtesy to your classmates and the instructor and to prevent disruption of the class.
5) You are expected to turn off your cell phones while in lecture. **The instructor will remove those students whose phones ring in class.**
5) Following exams the instructor will return graded exams within one week of the exam.

***Strategies for Success*:** (these suggestions have helped students to be successful in the past):

1) Record the lecture on tape and then play it back while reviewing your lectures notes. This will also help you if you have problems with the Aussie-Tex-Mex accent of the instructor. Note that many students like to "re-write" their lecture notes. Unfortunately, this is a singularly unproductive study method for many students. It is much more efficient to edit the notes you already have (even if they are a bit messy) while listening to the tape.
2) Form small study groups. Microbiology is a difficult subject; so forming small study groups early in the semester and getting together at least once a week to review that week's material is very helpful. If you can explain the material to someone else, it is likely that you will understand it yourself.
3) Learn the material as you go along rather than trying to learn it just before the exam. These are daily lectures of 2 hour each and the amount of material really accumulates quickly!!!.
4) If you have trouble getting to my office hours, take advantage of the supplemental instruction or the Learning Assistance Center (LAC) for questions about this topic, as well as for help on how to improve your study. The Supplemental Instructor is the best kept secret and it is your key to really improve your grades. Sis are very capable former students….use them if you have to!!!

Examinations: There will be three in class exams (**February 12**, **March 13**, **April 22**), and a final exam (**THURSDAY, May 8** from **10 AM – 12 PM**) given during the course. **NO MAKE UP EXAMS WILL BE GIVEN AND THE DATES OF THE EXAMS ARE FIRM. PLEASE MARK THEM ON YOUR CALENDAR.** The exams will consist of a combination of multiple choice, short answers and essay questions. The first three tests will be 50 questions and the final will be 100 questions. Review questions will be placed on the BIO205 home page. Answers for the review questions are posted on the BIO205 site. Some of the questions on

the examinations will be identical to the review questions; however, the wording, format or answers of others will be modified significantly. Some questions will be based on lecture material not in the text or review questions. If you would like to argue about points on exams, I will be glad to review the **entire exam** for accuracy with you so long as it is **not more that 1 week** after the exam was handed back.

Written assignment: The assignment for this problem is to choose a microbial agent that you come across in one of your multiple readings. If you select a microbial agent of humans, you may concentrate on the symptoms, treatment, mechanisms or prevention of the disease, or any combination. Write a 2-page (double-spaced, 10 to 12 point font) review of the disease. References should be noted within the text by numbers or first authors' names in parenthesis at the end of the appropriate sentence and the full references, properly cited, listed at the end of the paper. The final draft of the paper must be typed with one inch margins on all sides and will be due on **April 8th**. Please ask for help if you do not understand the assignment. Medline is a superb source for searching the literature concerning infectious disease as well as most topics in biological sciences. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi. Abstracts of many of the articles are available on line. Relatively few of the articles are available on line in full text versions. These are available at the library, on the web or by interlibrary loan. The references obtained from Medline are **real**, primary references and can be used freely for your paper. Use at **least 2** primary references for your paper. Although a substantial amount of information is available on the Internet from a variety of web-pages, the information is usually not reviewed and is often not reliable. Therefore, **an Internet reference cannot be used as one of the three required primary references**. The textbook is a good general reference, but **can not be used** as one of the three required references. At least two of the references must be from 2000 or later. A good source for general information concerning infectious disease is the CDC website: http://www.cdc.gov. The simplest reference citation system is the one used by ASM journals (e.g. Journal of Bacteriology). A detailed description of the assignment and citation of references is in a file that can be accessed from the MB205 web page. The paper will be due on **April 8th**.

Grades:

90% to 100%	is A
80% to 89%	is B
70% to 79%	is C
60% to 69%	is D
Below 60%	is F

The final grade may be curved, although this in **NOT** a likely scenario. The decision to curve will be based on the class performance as judged by the numerical scores at the end of the course. If a curve is applied, the same number of points will be added to the grade of all students. The three in-class exams will each count 50 points, the final will count 100 points, the written assignment will count 20 points for a total of 270 points. The grading of the research paper is described in a file on the BIO205 home page. Attendance at the lectures is not required, **only if a passing grade is desired**. Generally, students who do not attend class miss a substantial amount of information and often fail the course. Material will be presented in lectures that will appear on tests, but will not be in the textbook or in the summaries on the web. Any students caught cheating; either on the quizzes, tests, written and laboratory assignments will be dealt with under the guidelines and policies of Northern Arizona University. The complete policy on academic integrity is in Appendix F of NAU's Student Handbook. Specific University policies such as the Safe Working and Learning Environment, Students with Disabilities, Institutional Review Board, and Academic Integrity policies are available on the NAU web page or in the Student Handbook.

Total Points:

Exams:	250 points
Written Assignment	20 points
Total	270 points

Course outline:

Description Assignment	Chapter	Date
Themes of Microbiology	Chapter 1	Jan 15
Tools of the Laboratory	Chapter 3	
Characteristics of Prokaryotic Cells	Chapter 4	
Eukaryotic Cells	Chapter 5	
EXAM 1		Feb 12
An introduction to Viruses	Chapter 6	
Elements of Microbial Nutrition, Ecology and Growth	Chapter 7	
Microbial Metabolism	Chapter 8	
Microbial Genetics	Chapter 9	
Genetic Engineering	Chapter 10	
Physical and Chemical Control of Microbes	Chapter 11	
EXAM 2		March 13
LAST DAY TO DROP WITH A 'W'		March 14
Drugs, Microbes and the Host	Chapter 12	
Microbe – Human Interactions	Chapter 13	
Non-specific Host Defenses	Chapter 14	
Specific Immunity	Chapter 15	
Infectious Diseases of the Skin and Eyes	Chapter 18	
Diseases of the Nervous System	Chapter 19	
EXAM 3		April 22
Diseases of the Cardiovascular and Lymphatic Systems	Chapter 20	
Diseases of the Respiratory System	Chapter 21	
Oral and Gastrointestinal Diseases	Chapter 22	
Diseases of the Genitourinary System	Chapter 23	
Environmental Microbiology	Chapter 24	
FINAL EXAM		May 8

Additional Notes: BIO 305W is the written portion of the mandatory laboratory coursework which is a required part of the course. It is your choice whether to sign up for 305W or not – but you will be doing all of the work anyway and might as well sign up and get credit for that work.

FINALLY, BIO 205 MAY BE A PREREQUISITE FOR OTHER CLASSES YOU ARE INTERESTED IN TAKING AT A FUTURE DATE. THUS, CHECK ON THE PREREQUISITES BEFORE YOU DECIDE ON DROPPING THIS CLASS. YOU MAY FIND THAT YOU NEED BIO 205 TO GET INTO ANOTHER BIOLOGY CLASS SUCH AS IMMUNOBIOLOGY (BIO 401).