COURSE SYLLABUS

BSC 250 Microbiology and Human Disease Spring 2014

Instructor: Dhana Rao, Ph.D. Office: S-202B

Assistant Professor Email: raod@marshall.edu

Phone: 304 696 3154 (Marshall University)

Office Hours: Wednesday 10 am - 1 pm, Thursday 1-3 pm and Friday 1-2 pm

Classroom: Lecture: BBSC101 2:00 - 3:15 pm Wednesday and Friday

Lab: BBSC127 201: 8.05 - 9.50 Thursday

202: 10.00 – 11.50 Thursday

203: 10.00 – 11.50 Friday

Course Description: BSC 250 Microbiology and Human Disease (4 Cr)

Introduction to microbiology with emphasis on the role of microorganisms

in the disease process. Does not count toward a major in Biological Sciences.

PR: BSC 227 or equivalent with a grade of C or better

Textbook: 1. Microbiology (A Human Perspective) Nester, Anderson, Robert & Nester (7th Ed. 2011)

**COURSE POLICIES**:

1. Attendance: Your attendance is expected for each lecture and laboratory session in this course. Attendance is not taken for lectures but I do take attendance in the labs. Absence from either lecture or laboratory will make this course especially difficult. **Laboratory sessions cannot be made up due to the nature of the laboratory.**  You are responsible for any material missed by being absent. Absences from exams due to illness, death in the family, or institutional activities will be excused with the appropriate written notification to the instructor. In the case of illness, you should provide a physician’s note stating that you could not be present during the exam period for medical reasons. Missed exams or quizzes can be made up only in the case of a University approved absence or a weather related closure. It is your responsibility to be familiar with University policy, which can be found in the academic calendar or at thisweb address: <http://www.marshall.edu/academic-affairs/?page_id=802>

In case of a university approved absence for an exam, you must contact me as soon as possible to arrange for a make up exam, and the exam must be taken on the FIRST DAY that your approval expires. In case of absence for a sporting event or other University sanctioned activity, arrangements to make up the exam must be made BEFORE the day of the exam. Failure to follow either of these policies will result in you being considered absent without excuse for the exam. A make up exam may be, completely long answer or oral format.

2) Academic Dishonesty: Any form of academic dishonesty will not be tolerated. Refer to Undergraduate Catalogue for definitions of cheating, falsification, bribes and complicity.

1. Students with Disabilities: The Marshall University H.E.L.P. program is committed to providing assistance through individual tutoring, mentoring and support, as well as fair and legal access to educational opportunities for students diagnosed with Learning Disabilities (LD) and related disorders such as ADD/ADHD. If you have, or believe you may have, a handicap or learning disability that will make it difficult for you to complete this course as structured, please contact the H.E.L.P. office in Myers Hall at 696-6252 (http://www.marshall.edu/help/). The H.E.L.P. program will assess your situation and provide information designed to help me meet your educational needs.
2. Electronic Devices: Please turn off all cell phones, and other electronic devices when you enter the classroom. No electronic devices will be needed, and none will be permitted, during exams. The use or access of an electronic device during an exam will be considered academic dishonesty. Lectures may be taped during the lecture and lab components of the course.
3. Grading Policy: Your grade for this class will be based upon your performance on **2 lecture exams** and **2 laboratory exams**. Exams will be composed of multiple choice, True and False, as well as problem solving and critical thinking questions. Grading scale for this course will be: 100-90 (A), 89-80 (B), 79 -70 (C), 69-50 (D), and below 50 (F). In the event of illness or family death missed exams may be made up by mutual arrangement between the professor and student. You must complete 75% of the labs and exams to be entitled to an incomplete.
4. Laboratory Polices:

**Safety**: Live bacterial cultures are used in this course, since your laboratory desk is shared with at least 5 other students it is necessary to disinfect your work area each time you come to lab. It is also necessary to wash your hands with any of the various antiseptics provided after finishing the laboratory period. No eating or drinking is permitted in this laboratory. In the event of a spilled culture, notify the instructor immediately so that the contaminated area can be treated with a disinfectant.

**Attendance**: Laboratory attendance is required and it is not possible to make up missed laboratory sessions. **More than 2 unexcused absences from the lab will result in lowering your grade one letter.**

**Two written examinations**, consisting multiple choice, short answer and problem solving questions will be used to assess student performance in the laboratory.

**Lecture Course Objectives** – Students completing this course should:

1. Appreciate the historical contributions of Pasteur, Koch, Jenner, Erhlich, Flemming and others have made to the field of medicine.
2. Recognize the major groups of microorganisms comprising the microbial world including viruses, bacteria, fungi and protozoans and algae.
3. Understand the anatomy, physiology, growth and genetic exchange mechanisms in bacteria.
4. Understand the host-parasite relationship and the role of microorganisms in the disease process.
5. Understand the basic host defense mechanism in preventing microbial diseases including non-specific and specific immune responses.
6. Understand the immune response in cancer, organ transplantation, autoimmunity and hypersensitivity reactions.
7. Understand the etiology and pathogenesis of selected bacterial, viral and mycotic diseases in man.

**Laboratory Course Objectives** – Students satisfactorily completing this laboratory component of this course should be able to:

1. Use the bright-field microscope to observe bacteria.
2. Be able to prepare a bacterial smear and complete the Gram Stain procedure.
3. Prepare culture media and understand different methods of sterilization.
4. Enumerate bacteria using the viable plate count method.
5. Isolate and characterize *Staphylococci* from the nasal passage.
6. Determine the sensitivity of bacteria to antibiotics and understand the emergence of resistant bacteria.
7. Identify members of the Enterobacteriaceae by their biochemical profiles.
8. Estimate and characterize bacteria in selected foods.
9. Complete the microbiological tests used in testing of potable and recreational water.

Spring 2014 BSC 250 Lecture Syllabus Dr. Dhana Rao

Microbiology and Human Disease

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| Week No. | Date | Lecture Topic | Text Chapter |
| 1 | 01-15-14  01-17-14 | Historical Developments and Introduction to the microbial worldi  Major Groups of Microbes | 1 |
| 2 | 01-22-14  01-24-14 | Microscopy and Microscopic techniques  Cell morphology –Prokaryotic Cell and Eurkaryotic Cell | 3  3 |
| 3 | 01-29-14  01-31-14 | Growth of Bacteria (Bacterial Growth Curve)  Methods to Detect and Measure Growth and Control of Growth | 4  4, 5 |
| 4 | 02-05-14  02-07-14 | Genomics and Genetic Exchange in Bacteria  Classification of Prokaryotes and Diversity | 7, 8  10 |
| 5 | 02-12-14  02-14-14 | Introduction to viruses, viroids and prions  The Innate Immune Response | 13  14 |
| 6 | 02-19-14  02-21-14 | Adaptive Immune response  Host-Microbe Interactions | 15  16 |
| 7 | 02-26-14  02-28-14 | Applications of Immune Responses, Immunologic disorders  Epidemiology | 17,18  19 |
| 8 | 03-05-14  03-07-14 | **Theory exam 1** (includes everything from weeks 1-6)  Epidemiology contd | 19 |
| 9 | 03-12-14  03-14-14 | Antimicrobial medications  Antimicrobial medications contd. | 20  20 |
|  |  | **SPRING BREAK** |  |
| 10 | 03-26-14  03-28-14 | Respiratory System Infections  Tuberculosis, Diphtheria, Whooping cough  Streptococcal and Pneumococcal infections, Legionella | 21 |  |
| 11 | 04-02-14  04-04-14 | No lecture – Read : The Bright Side of Prions  No lecture – Read : Outwitting the perfect pathogen |  |
| 12 | 04-09-14  04-11-14 | Skin and Wound infections  Digestive System Infections  Periodontal Disease, Gingivitis,  Cholera, Hepatitis, Crypto | 22,23  24 |
| 13 | 04-16-14  04-18-14 | Genitourinary Tract Infections  HIV/AIDS, Gonorrhea, Syphilis  Nervous System Infections | 25, 28  26 |
| 14 | 04-23-14  04-25-14 | **LAB EXAM 2**  Blood and Lymphatic Infections | 27 |
| 15 | 04-30-14  05-02-14 | Catch-up  Revision |  |
|  | 05-05-14 | **FINAL EXAM** (includes everything from Weeks 7 – 14) |  |

Spring 2014 BSC 250 Lab Syllabus Dr. Dhana Rao

Microbiology and Human Disease

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| Week beginning | Laboratory Topic |
| 1  01-13-14 | Orientation to the Microbiology Lab and Safety Regulations  Preparation of a Bacterial Smear  The Simple Stain, Bright Field Microscopy |
| 2  01-20-14 | The Gram Stain Procedure  Capsule and Endospore Stain |
| 3  01-27-14 | Preparation of Culture Media  Sterilization of Culture Media and Methods of sterilization  Culture conditions for bacteria |
| 4  02-03-14 | Viable plate count  Aseptic Technique |
| 5  02-10-14 | Evaluation of Viable Plate Count  Isolation of Bacteria from Human Microbiota |
| 6  02-17-14 | Biochemical Tests to ID Staphylococci  Environmental Lab  Inoculate TSB broth |
| 7  02-24-14 | Antibiotic Sensitivity Tests (Kirby-Bauer)  Antiseptics and Hand-washing Experiment |
| 8  03-03-14 | Evaluate Antibiotic Tests  Evaluate Hand-washing Experiment  Carbohydrate Fermentation |
| 9  03-10-14 | **MID-TERM LAB EXAM** |
| 03-17-14 | Spring break |
| 10  03-24-14 | Biochemical Tests on Gram-Negative Bacteria |
| 11  03-31-14 | No lab  Watch video on your own. http://www.youtube.com/watch?v=dedlL8l0YIM |
| 12  04-07-14 | Microbiology of Water (MPN, Colilert, Membrane Filtration)  Evaluate Biochemical results |
| 13  04-14-14 | Evaluate Water lab  Bioinformatics |
| 14  04-21-14 | Bioinformatics contd.  Lab Exam (during lecture time) |
| 15  04-28-14 | NO LABS |