

# SYLLABUS BIOL 2900

Fall, 2013

## Course: Microbiology in Health and Disease

Instructor: Prafull C. Shah

Office: BC 2092

Office Hours: Before or after Class or by appointment

**Semester Begins on August 12, 2013 and ends on December 2, 2013**

<b>COURSE NO. 81282</b>	<b>BIOL</b>	<b>2900</b>	<b>A</b>	<b>4.00</b>	<b>Microbiology in Health/Disease</b>	<b>Main Campus</b>		
<b>LECTURE</b>					<b>MON - WED - FRI</b>	<b>09:00 am - 09:50 am</b>	<b>BC 1025</b>	<b>LECTURE</b>
<b>LAB</b>					<b>MON - WED</b>	<b>10:30 am - 11:55 am</b>	<b>BC 2068</b>	<b>LAB</b>

**Semester Begins on August 12, 2013 and ends on December 2, 2013**

<b>COURSE NO. 81283</b>	<b>BIOL</b>	<b>2900</b>	<b>B</b>	<b>4.00</b>	<b>Microbiology in Health/Disease</b>	<b>Main Campus</b>		
<b>LECTURE</b>					<b>WED - THURS</b>	<b>05:30 pm - 06:45 pm</b>	<b>BC 2022</b>	<b>LECTURE</b>
<b>LAB</b>					<b>WED - THURS</b>	<b>06:55 pm - 08:20 pm</b>	<b>BC 2068</b>	<b>LAB</b>

### COURSE OBJECTIVES:

With a focus on healthcare majors, the objectives of this course are:

- (a) To introduce students to microbiology and the vital role microorganisms play in the well-being of higher forms of life, as well as in causing diseases, mostly as opportunists,
- (b) To learn various groups of microorganisms and what makes them infectious,
- (c) To learn most common infections caused by microorganisms, and
- (d) To learn the preventive and curative measures against common infections.

### **SPECIAL NOTES TO STUDENTS:**

1. In order to respect the privacy of each student, exam scores and grades will not be posted, given out by telephone, or sent to students by email.
2. Students are advised to consult the VSU Student Handbook, Undergraduate Catalog, Semester Calendar, Schedule of Classes, & Registration Guide for information about VSU policies and procedures regarding registration, drop/add, and withdrawal. Students are not permitted to withdraw after midterm except in cases of hardship.
3. Students requesting classroom accommodations or modifications because of a documented disability should contact the Access Office for Students with Disabilities, 1115 Nevins Hall.
4. Cell phones are to be turned off during classes and examinations.
5. Students are responsible for reading and following the Biology Department policy on plagiarism.
- 6. Since important concepts are explained in the classroom, missing classes may seriously impact grades.**
7. Make-up examination or quiz WILL NOT BE OFFERED, except under a **verifiable** exceptional and unavoidable circumstance. If offered, it will be at the discretion of the Instructor, AND will not carry full earned points.
8. Changes to this syllabus may be made during the Semester.

### **GRADES:**

- (1) There will be periodic quizzes, a mid-term examination and a final examination. Quizzes and exams typically consist of multiple choice, matching, fill-in blanks type of questions, including some open book. However, students may be challenged with questions that may require creative thinking and true understanding of concepts in order to answer them correctly.
- (2) In addition, there may be special assignments and projects which will be announced in the class.
- (3) Vocabulary, spelling and pronunciation of medical terms may be important parts of assignments, quizzes and examinations.
- (4) Lab. portion of testing will be merged with lectures.
- (5) Periodic quizzes will be worth a total of 100 points.
- (6) Mid-term examination will be worth 75 points.
- (7) Special projects or presentations will be worth 25 points.
- (8) Final examination will be worth 100 points.
- (9) Between quizzes, mid-term, final examination, special projects and presentations, each student can earn a maximum of 300 points.

**GRADING SCALE:**

Grade A = Between 270 and 300 points

Grade B = Between 240 and 269 points

Grade C = Between 210 and 239 points

Grade D = Between 195 and 209 points

Grade F = 194 or less points

Week 1	
Subject(s)	Learning Objectives
General course information Introduction to Microbial World Safety in microbiology laboratory Personal and patient safety in healthcare environment Introduction to Microscopy	History of Microbiology. Role of microbes in nature, well-being of other living things, science, health and diseases. Introduction to Microbiology Laboratory Safety, hand hygiene Proper handling and use of microscope
Week 2	
The Molecules of Life Microscopy and Cell Structure Use of Microscope, Practice of focusing on human blood components Practice of using oil immersion lens	Characteristics of prokaryotic and eukaryotic cells Principles of microscopy, use of microscopes Distinction of various groups of bacteria
Week 3	
Microbial Metabolism, Physiology and Genetics Wet Examination of microscopic life in pond/swamp water - Protozoa, Algae, Cyanobacteria Culture of normal environmental and body flora	How microbes live and multiply Study of higher forms of microbial life What grows where?
Week 4	
Host Defense Mechanisms – Role of normal flora and physical barriers to infections Natural and Acquired Immunity Study of growth acquired from environmental and body flora Colony characteristics and simple stain of recovered bacteria	How physical make-up of human body defend against infections What are natural, acquired and artificial means of combating infections Are our counters, keyboards, drains, toilet seats, door handles AND our mouths, skin and noses STERILE? What do they grow?
Week 5	
Infectious Disease Process – How Microbes survive host defenses and cause infection Importance of Gram Stain Gram Stain of bacteria	Organism mutation, virulence, drug resistance, avoidance of phagocytosis Gram Stain as an important diagnostic tool

Week 6	
Control of Microbial Growth – Disinfection and Sterilization Demonstration of Steam sterilization and Sterility Check Gram Stain of common pathogenic bacteria	Levels of sanitization, disinfection, and sterilization under various situations
Week 7	
Aerobic Gram Positive Cocci and their clinical significance	What is available at the disposal of clinicians to diagnose infectious diseases?
Week 8	
Diagnosis of Infectious Diseases in clinical Laboratory - Methods for the direct and indirect, rapid and slow techniques employed in a clinical Microbiology laboratory Demonstration of rapid diagnostic techniques used in a POC or ED laboratory Differentiation of Gram Positive Cocci in a laboratory Introduction to Antimicrobial Agents	Introduction to Staphylococci, and their impact on humans Treatment options for microbial infections
Week 9	
Continuation of Antimicrobial Agents Continuation of Aerobic Gram Positive Cocci Differentiation of Gram Positive Cocci in a laboratory	Treatment of microbial infections
Week 10	
Clinically significant aerobic Enteric Gram Negative bacteria – Escherichia, Salmonella, Shigella Differentiation of Gram Negative Bacilli in a laboratory	Introduction to Enterobacteriaceae, and their impact on humans

Week 11	
Clinically significant aerobic Non-Enteric Gram Negative bacteria – Pseudomonas, Acinetobacter, Haemophilus Antimicrobial Susceptibility testing – Principles and procedures Antimicrobial Susceptibility Results – Their Interpretation and Applicability to patient care	How the results from a Microbiology laboratory may be applied in patient treatment Introduction to non-enteric aerobic bacteria, and their impact on humans How antimicrobial treatment parameters are determined
Week 12	
Clinically significant: Gram Negative diplococci – Neisseria, Moraxella Gram Positive Bacilli - Bacillus, Listeria Spiral bacteria – Treponema, Leptospira	Introduction to Neisseria, Bacillus, and Spirochaetes, and their impact on humans
Week 13	
Clinically significant anaerobic bacteria – Clostridium, Bacteroides	Introduction to anaerobic bacteria , and their impact on humans
Week 14	
Clinically significant miscellaneous microorganisms – Viruses, Parasites, Chlamydia, Mycobacteria, Fungi, Yeasts <b><u>Etiology of common human infections:</u></b> Urinary tract, Respiratory, Gastro-intestinal, Genito-urinary, Skin and Wound infections	Introduction to non-bacterial Microbial pathogens  Agents responsible for most common infections
Week 15	
Review and interpretation of important laboratory results Epidemiology, Emerging Diseases and Public Health Role of Infection Control Personnel Review	Challenges posed by MRSA – “The Superbug”, CDAD, EHAC and other emerging, important infections and how to control them
Week 16	
<b>Final Examination</b> End of Semester	