

# SYLLABUS BIOL 2900 - B

Fall, 2014

## Course: Microbiology in Health and Disease

Instructor: Prafull C. Shah

Office Hours: Before or after classes, or by appointment by Email to [pcshah@valdosta.edu](mailto:pcshah@valdosta.edu).

**Semester begins on August 18, 2014 and ends on December 8, 2014**

<b>COURSE NO. 81757</b>	<b>BIOL 2900 B 4.00</b>	<b>Microbiology in Health/Disease</b>	<b>Main Campus</b>
<b>LECTURE</b>		<b>WED and THUR 03:30 pm - 04:45 pm</b>	<b>BC 1025 LECTURE</b>
<b>LAB</b>		<b>WED and THUR 05:00 pm - 06:25 pm</b>	<b>BC 2068 LAB</b>

### COURSE OBJECTIVES:

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

- 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,
- To learn various groups of microorganisms and what makes them infectious,
- To learn most common infections caused by microorganisms, and
- To learn the preventive and curative measures against common infections.

### SPECIAL NOTES TO STUDENTS:

- 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.
- 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.
- 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) Vocabulary, spelling and pronunciation of medical terms may be important parts of quizzes and examinations.
- (3) Lab. portion of testing will be merged with lectures.
- (4) Periodic quizzes will be worth a total of 200 points.
- (5) Mid-term examination will be worth 100 points.
- (6) Final examination will be worth 100 points.
- (7) Between quizzes, mid-term, and final examination, each student can earn a maximum of 400 points.
- (8) In additions, students may be offered opportunities to earn bonus points for completing activities that promote infection control and/or enhance their knowledge as future healthcare professionals.

### **GRADING SCALE:**

Grade A = Total points earned between 360 and 400  
Grade B = Total points earned between 320 and 359  
Grade C = Total points earned between 280 and 319  
Grade D = Total points earned between 260 and 279  
Grade F = Total points earned 259 or less

<b>Week 1</b>	
<b>Subject(s)</b>	<b>Learning Objectives</b>
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
<b>Week 2</b>	
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
<b>Week 3</b>	
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?
<b>Week 4</b>	
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?
<b>Week 5</b>	
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

<b>Week 6</b>	
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
<b>Week 7</b>	
Aerobic Gram Positive Cocci and their clinical significance	What is available at the disposal of clinicians to diagnose infectious diseases?
<b>Week 8</b>	
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
<b>Week 9</b>	
Continuation of Antimicrobial Agents Continuation of Aerobic Gram Positive Cocci Differentiation of Gram Positive Cocci in a laboratory	Treatment of microbial infections
<b>Week 10</b>	
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
<b>Week 11</b>	
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

<b>Week 12</b>	
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
<b>Week 13</b>	
Clinically significant anaerobic bacteria – Clostridium, Bacteroides	Introduction to anaerobic bacteria , and their impact on humans
<b>Week 14</b>	
Clinically significant miscellaneous microorganisms – Viruses, Parasites, Chlamydia, Mycobacteria, Fungi, Yeasts <b>Etiology of common human infections:</b> Urinary tract, Respiratory, Gastro-intestinal, Genito-urinary, Skin and Wound infections	Introduction to non-bacterial Microbial pathogens  Agents responsible for most common infections
<b>Week 15</b>	
Review and interpretation of important laboratory results Epidemiology, Emerging Diseases and Public Health Role of Infection Control Personnel Review	Challenges posed by “The Superbugs”, MRSA, CDAD, EHAC and other emerging, important infections and how to control them
<b>Week 16</b>	
<b>Final Examination</b> End of Semester	