SYLLABUS BIOL 2900 SECTION “C” Spring 2015
Instructor: Bipin Patel
Course: Microbiology in Health and Disease
Office Hours: Before or after class or by appointment

Semester Begins January 12th TO May 6th 2015

<table>
<thead>
<tr>
<th>2900 D 4.00</th>
<th>Microbiology in Health/Disease</th>
<th>Main Campus</th>
</tr>
</thead>
<tbody>
<tr>
<td>LECTURE</td>
<td>MON-TUES 05:30 pm - 06:45 pm</td>
<td>BC 1025LECTURE</td>
</tr>
<tr>
<td>LAB</td>
<td>MON-TUES - 06:55 pm - 08:20 pm</td>
<td>BC 2068LAB</td>
</tr>
</tbody>
</table>

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.

GRADES:

1. There will be tests, a mid-term examination and a final examination. Tests 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, tests and examinations.

4. Lab. portion of testing will be merged with lectures.

5. Tests will be worth a total of 150 points.

6. Mid-term examination will be worth 150 points.

7. Special projects or presentations will be worth 50 points.

8. Final examination will be worth 250 points.

9. Between tests, mid-term, final examination, special projects and presentations, each student can earn a maximum of 600 points.

GRADING SCALE:

Grade A = 90 -100% or between 540 and 600 points
Grade B = 80 - 89% or between 480 and 539 points
Grade C = 70 – 79% or between 420 and 479 points
Grade D = 60 – 69% or between 360 and 419 points
Grade F = Less than 60% or 359 or less points
<table>
<thead>
<tr>
<th>Week 1</th>
<th>Learning Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subject(s)</strong></td>
<td></td>
</tr>
<tr>
<td>General course information</td>
<td>History of Microbiology, role of microbes in nature, well-being of other living things, science, health and diseases. Introduction to microbiology and biochemistry</td>
</tr>
<tr>
<td>Introduction to Microbial World</td>
<td></td>
</tr>
<tr>
<td>Introduction to Microscopy</td>
<td></td>
</tr>
<tr>
<td>Personal and patient safety in healthcare environment</td>
<td></td>
</tr>
<tr>
<td>Safety in microbiology laboratory</td>
<td></td>
</tr>
<tr>
<td><strong>Week 2</strong></td>
<td>Characteristics of prokaryotic and eukaryotic cells Principles of microscopy, use of microscopes Distinction of various groups of bacteria</td>
</tr>
<tr>
<td><strong>The Molecules of Life Microscopy and Cell Structure</strong></td>
<td></td>
</tr>
<tr>
<td>Use of Microscope, Practice of focusing on human blood components Practice of using oil immersion lens</td>
<td></td>
</tr>
<tr>
<td><strong>Week 3</strong></td>
<td>How microbes live and multiply Study of higher forms of microbial life What grows where?</td>
</tr>
<tr>
<td><strong>Microbial Metabolism, Physiology and Genetics</strong></td>
<td></td>
</tr>
<tr>
<td>Examination of microscopic life in pond water - Protozoa, Algae, Cyanobacteria Culture of normal environmental and body flora</td>
<td></td>
</tr>
<tr>
<td><strong>Week 4</strong></td>
<td>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?</td>
</tr>
<tr>
<td><strong>Host Defense Mechanisms – Role of normal flora and physical barriers to infections</strong></td>
<td></td>
</tr>
<tr>
<td>Natural and Acquired Immunity</td>
<td></td>
</tr>
<tr>
<td>Study of growth acquired from environmental and body flora Colony characteristics and simple stain of recovered bacteria</td>
<td></td>
</tr>
<tr>
<td><strong>Week 5</strong></td>
<td>Organism mutation, virulence, drug resistance, avoidance of phagocytosis Gram Stain as an important diagnostic tool</td>
</tr>
<tr>
<td><strong>FIRST TEST</strong></td>
<td></td>
</tr>
<tr>
<td>Infectious Disease Process – How Microbes survive host defenses and cause infection Importance of Gram Stain</td>
<td></td>
</tr>
<tr>
<td>Gram Stain of bacteria recovered from previous exercise</td>
<td></td>
</tr>
<tr>
<td><strong>Week 6</strong></td>
<td>Levels of sanitization, disinfection, and sterilization under various situations</td>
</tr>
<tr>
<td><strong>Control of Microbial Growth – Disinfection and Sterilization</strong></td>
<td></td>
</tr>
<tr>
<td>Demonstration of Steam sterilization and Sterility Check Gram Stain of common pathogenic bacteria</td>
<td></td>
</tr>
<tr>
<td><strong>Week 7</strong></td>
<td>What is available at the disposal of clinicians to diagnose infectious diseases?</td>
</tr>
<tr>
<td><strong>Diagnosis of Infectious Diseases in clinical Laboratory - Methods for the direct and indirect, rapid and slow techniques employed in a clinical Microbiology laboratory</strong></td>
<td></td>
</tr>
<tr>
<td>Demonstration of rapid diagnostic techniques used in a POC or ED laboratory</td>
<td></td>
</tr>
<tr>
<td><strong>Week 8</strong></td>
<td>Treatment of microbial infections Introduction to Staphylococci, and their impact on humans</td>
</tr>
<tr>
<td><strong>MID-TERM EXAMINATION</strong></td>
<td></td>
</tr>
<tr>
<td>Introduction to Antimicrobial Agents Aerobic Gram Positive Cocci and their clinical significance Differentiation of Gram Positive Cocci in a laboratory</td>
<td></td>
</tr>
<tr>
<td>Week</td>
<td>Topic</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
</tr>
</tbody>
</table>
| **Week 9** | Continuation of Antimicrobial Agents  
Continuation of Aerobic Gram Positive Cocci  
Differentiation of Gram Positive Cocci in a laboratory |
| **Week 10** | Treatment of microbial infections |
| **Week 11** | Antimicrobial Susceptibility testing – Principles, procedures, and results  
Clinically significant aerobic Enteric Gram Negative bacteria – Escherichia, Salmonella, Shigella |
| **Week 12** | How antimicrobial treatment parameters are determined  
Introduction to Enterobacteriaceae, and their impact on humans |
| **Week 13** | Antimicrobial Susceptibility Results – Their Interpretation and Applicability to patient care  
Clinically significant aerobic Non-Enteric Gram Negative bacteria – Pseudomonas, Acinetobacter, Haemophilus |
| **Week 14** | How the results from a Microbiology laboratory may be applied in patient treatment  
Introduction to non-enteric aerobic bacteria, and their impact on humans |
| **Week 15** | Clinically significant:  
Gram Negative diplococci – Neisseria, Moraxella Gram Positive Bacilli - Bacillus, Listeria  
Spiral bacteria – Treponema, Leptospira |
| **Week 16** | Introduction to Neisseria, Bacillus, and Spirochaetes, and their impact on humans |
| **SECOND TEST** | Clinically significant anaerobic bacteria – Clostridium, Bacteroides |
| **Week 17** | Introduction to anaerobic bacteria, and their impact on humans |
| | Clinically significant miscellaneous microorganisms – Viruses, Parasites, Chlamydia, Mycobacteria, Fungi, Yeasts  
Etiology of common human infections:  
Urinary tract, Respiratory, Gastro-intestinal, Genito-urinary, Skin and Wound infections |
| **Week 18** | Introduction to non-bacterial Microbial pathogens  
Agents responsible for most common infections |
| **Week 19** | Review and interpretation of important laboratory results  
Epidemiology, Emerging Diseases and Public Health Role of Infection Control Personnel  
Review & Class Picture  
Visit to a Clinical Testing Laboratory in Working |
| **Week 20** | Challenges posed by MRSA – “The Superbug”, CDAD, EHAC and other emerging, important infections and how to control them |
| **Week 21** | **FINAL EXAMINATION**  
End of Semster |