UTRGV COURSE SYLLABUS
CLINICAL LABORATORY SCIENCES
Clinical Microbiology II CLSC 4631.01 & CLSC 4631.A

Principle Lecture Instructor:

Instructor Name: Maria Elena Reyna, MA, MT (ASCP)
Term: Spring 2016
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UTRGV email address: maria.reyna@utrgv.edu
Meeting times and location: Lecture-10:50 AM-12:05PM MTWR HSHW 2.204 Lab: 1:40pm -3:40pm TR & 4:30pm-5:30pm W HSHW 2.106
Office location & hours: HSHW 2.312 Tuesday and Thursday 9:30-10:30A.M. & Wednesday 1:30-3:30P.M.

REQUIRED TEXTBOOKS:


Course Description and Prerequisites
This course is a continuation of Clinical Microbiology I with an emphasis on fastidious bacteria, mycobacteria, fungi, viruses, and rickettsia. Disease processes, therapy and prevention as they relate to microbiology will also be emphasized. Advanced concepts in pre-analytical, analytical and post-analytical processes are discussed.
Co/Prerequisites: CLSC 3630 or permission of the instructor.

Learning Objectives/Outcomes for the Course

1. Demonstrate entry level knowledge and skills in hematology.
2. Demonstrate entry level knowledge and skills in clinical chemistry.
3. Demonstrate entry level knowledge and skills in immunohematology.
4. Demonstrate entry level knowledge and skills in microbiology.
5. Demonstrate entry level knowledge and skills in the area of immunology.
6. Demonstrate entry level knowledge and skills in the area of urinalysis and body

Learning Objectives for Core Curriculum Requirements

AFFECTIVE OBJECTIVES:
Upon completion of the laboratory and lecture sections of this course, the student should be able to:

1. Show concern for his/her own safety as well as those of fellow students by adhering to established safety rules.
2. Demonstrate an appreciation for neatness by maintaining the work area in an orderly and clean manner, returning all materials to their appropriate area after use.
3. Demonstrate dependability by attending all lecture and laboratory sessions and arriving promptly at the designated time.
4. Follow instructions on procedures and use of materials.
5. Demonstrate an acceptance of responsibility for his/her own learning by consistently preparing for class and laboratory sessions, voluntarily seeking information, asking pertinent questions and seeking personal priorities to allow for academic success.
6. Show initiative by seeking additional tasks without being directed by the instructor.
7. Accept constructive criticism as part of the learning process and act upon suggestions for improvement.
8. Exhibit a respectful, courteous and friendly attitude when working with fellow students and instructors.
9. Use equipment and supplies in a careful responsible manner.
10. Show an appreciation for teamwork by working cooperatively and constructively in groups when directed by the instructor.
11. Listen attentively during class activities.
12. Exhibit an acceptable level of self-confidence in his/her ability to perform laboratory functions.
13. Use time wisely organizing and completing assignments in a timely fashion and following through when problems arise.
14. Demonstrate integrity by striving to perform to the best of his/her ability, admitting mistakes and taking appropriate corrective action.
15. Demonstrate adaptability by being flexible to changes that may occur in both lecture and laboratory settings.

LECTURE OBJECTIVES:
Upon completion of this course and without the aid of notes or textbook, the student should be able to achieve the following. Achievement will be met when a minimum score of 70% percent is earned as detailed in the methods of evaluation section of this syllabus.

I. Antimicrobial susceptibility testing
   1. Describe the mode of action of antimicrobial agents.
   2. Describe the mechanisms involved in the development of resistance to antimicrobial agents by bacteria.
   3. Explain the purpose of antimicrobial susceptibility testing.
   4. Define MIC and discuss MIC testing methods.
   5. Explain the various manual antimicrobial susceptibility testing methods.
   6. Describe the various automated antimicrobial susceptibility testing methods.
   7. Evaluate the Clinical and Laboratory Standards Institute-recommended methods for disk susceptibility testing, criteria for quality control testing, and tables for interpretive zone diameters.
   8. Evaluate the following antimicrobial susceptibility tests:
a. MIC  
b. Kirby-Bauer  
c. MBC  
d. Schlichter test-Serum Bactericidal Test  
e. Etest  
f. Extended spectrum beta-lactamase testing  
g. β-lactamase testing

9. Select the most effective antimicrobial agents for the following organisms:
   a. M. tuberculosis  
   b. N. gonorrheae, N. meningitidis, H. influenzae  
   c. B. fragilis, Clostridium difficile, Clostridium perfringens  
   d. P. aeruginosa  
   e. S. aureus, MRSA, S. epidermidis, S. saprophyticus  
   f. S. pyogenes, S. agalactiae, S. pneumoniae, E. faecalis, VRE  
   g. E. coli, Klebsiella, Enterobacter, Serratia, Proteus, Providencia  
   h. Salmonella, Vibrio, Shigella, Campylobacter

II. Anaerobes
   1. Define anaerobes.  
   2. Assess toxicity of oxygen to anaerobes.  
   3. Describe laboratory culture, isolation and identification of anaerobes.  
   4. Propose body sites where anaerobes can be found as normal flora.  
   5. Categorize anaerobic infections.  
   6. Given the history of a patient with gas gangrene:
      a. propose appropriate culture sample and collection method  
      b. evaluate the diagnostic value of a sample gram stain  
      c. select the appropriate laboratory testing procedure  
      d. predict the specie of organism most likely involved.  
   7. Given the history of a patient with post-antibiotic pseudo-membranous colitis:
      a. propose appropriate culture sample and collection method  
      b. evaluate the diagnostic value of a sample gram stain  
      c. select the appropriate laboratory testing procedure  
      d. predict the specie of organism most likely involved.  
   8. Given the history of an infant with botulism:
      a. propose appropriate culture sample and collection method  
      b. evaluate the diagnostic value of a sample gram stain  
      c. select the appropriate laboratory testing procedure  
      d. predict the specie of organism most likely involved.  
   8. Differentiate the laboratory identification between pathogenic isolates.  
   9. List recommended treatment protocols.

III. Mycobacteria
   1. List the general properties of Mycobacteria and indicate how they differ from other bacteria  
   2. List the medically significant Mycobacteria  
   3. Evaluate safety measures taken when working with Mycobacteria  
   4. Evaluate specimen collection and processing for optimum recovery of Mycobacteria  
   5. Describe the principles and procedures behind staining techniques that demonstrate
Mycobacteria in clinical samples
6. Describe various culture media used to isolate Mycobacteria
7. Construct tests used to identify Mycobacteria
8. Assess the etiology of mycobacterium tuberculosis
9. Categorize organisms that cause tuberculosis
10. Analyze the consequence of inhaling or ingesting the tuberculosis bacilli
11. Discuss the classification of Mycobacteria
12. List recommended treatment protocols.

IV. Vibrio, Aeromonas Plesiomonas & Campylobacter
1. Describe the general characteristics of organisms in the Vibrio genus.
2. Describe the general characteristics of organisms in the Aeromonas genus.
3. Describe the general characteristics of organisms in the Plesiomonas genus.
4. Describe the general characteristics of the Campylobacter organisms.
7. List recommended treatment protocols.

V. Upper and lower respiratory tract infections
1. Evaluate the mechanical defense of the respiratory tract and explain how alteration in this defense can result in infection of the respiratory tract.
2. Assess the significance of normal flora in the respiratory tract.
3. Evaluate the proper collection of cultures and specific criteria for acceptance or rejection.
4. Recommend proper collection and examination of respiratory secretions.
5. Describe the etiology of infections of the upper respiratory tract and lower respiratory tract.
6. List common pathogens associated with the upper and lower respiratory tract and differentiate the laboratory identification between pathogenic isolates.
7. List recommended treatment protocols.

VI. Skin and soft tissue infections
1. Assess the significance of normal skin flora.
2. Propose causative agents of primary bacterial skin infections
3. Evaluate the following skin infections: impetigo, folliculitis, furuncle, carbuncle, cellulitis, erysipelas, myonecrosis, paronychia, erysipeloid, erythrasma
4. Propose laboratory diagnosis protocols for the above skin infections
5. Describe skin infections of fungal, viral and parasitic origin.
6. Evaluate the role of mycobacteria in the causation of skin infections.
7. Differentiate the laboratory identification between pathogenic isolates.

VII. Gastrointestinal tract infections
1. Evaluate the significance of normal flora in the gastrointestinal tract.
2. Examine the pathogenic mechanisms involved in bacterial diarrheas.
3. Describe bacteria, viruses and parasites that cause diarrhea.
4. Evaluate sample collection, processing and laboratory diagnosis of gastrointestinal infections.
5. Differentiate the laboratory identification between pathogenic isolates; include any special isolation methods and/or media requirements.
VIII. Infections of the central nervous system
1. Describe the characteristics of normal and abnormal CSF.
2. Describe the collection, transport and processing of CSF.
3. Evaluate the significance of lymphocytic pleocytosis in a CSF specimen.
4. Evaluate the etiology of bacterial meningitis.
5. Propose bacteria, fungi and parasites that can cause brain abscess.
6. Describe meningitis caused by fungi.
7. Describe meningitis caused by viruses.
8. Evaluate laboratory diagnosis of meningitis.
9. Differentiate the laboratory identification between pathogenic isolates isolated in CSF samples.
10. List recommended treatment protocols.

IX. Bacteremia
1. Define bacteremia and differentiate the types of bacteremia.
2. Evaluate the etiology of bacteremia and common treatment.
3. Discuss the role of endotoxin in bacteremia severity.
4. List common blood culture isolates that are usually considered contaminates.
5. List common blood culture isolates and differentiate the laboratory identification between common pathogenic isolates.
6. Contrast blood collection for bacterial culture with a routine venipuncture.
7. Describe the classification of bacteremia and source of infections.
8. Describe the recommend collection method and volume of blood cultures by age groups.
10. Discuss clinical syndromes associated with bacteremia, include % occurrences and common pathogens isolated.
11. Evaluate bacteremic episodes, time of collection, and frequency of collection.
12. Evaluate the rationale for multiple blood collections.
13. Describe different blood culture methods used in laboratories.
14. List methods used to isolate fastidious or special conditions required for isolating fastidious organisms.
15. Discuss the expected contamination rate for blood cultures.
16. List recommended treatment protocols.

X. Urinary tract infections (UTIs)
1. Evaluate the etiology of urinary tract infections with associated organisms isolated.
2. Assess the prevalence of UTIs in age groups and genders.
3. Differentiate between a midstream, catheterized, and suprapubic aspiration collection.
4. Describe the proper specimen transport and processing requirements for urine culture samples.
5. List common UTI isolates.
6. Evaluate proper sample collection and laboratory diagnosis of UTIs.
7. Describe the criteria used to perform an ID and susceptibility test from a urine culture based on the colony count.
8. Discuss the criteria used to request a recollection when a sample is considered to be contaminated.
9. Describe the proper method used to inoculate a urine culture and how the colony count is calculated.
10. Differentiate the laboratory identification between pathogenic isolates.
11. List recommended treatment protocols.
XI. Sexually transmitted diseases (STDs)
1. Evaluate the etiology of diseases produced by the following: N. gonorrhea, C. trachomatis, G. vaginalis, T. pallidum, H. ducreyi, and H. simplex.
2. Evaluate proper sample collection and laboratory diagnosis of STDs.
3. Describe serological testing in the diagnosis of STDs.
4. List common treatments used for STD’s.
5. Differentiate the laboratory identification between pathogenic isolates include the gram stain interpretation as applicable.

XII. Medical mycology
1. Explain the taxonomy of fungi.
2. Define basic terminology used in describing medically important fungi.
3. Distinguish between fungal contaminants and medically important fungal pathogens.
4. Assess the role of fungal contaminants as opportunistic pathogens in humans.
5. Evaluate medically important superficial fungi including sample requirements and laboratory identification.
6. Evaluate medically important dermatophytic fungi, including diseases they cause in humans and laboratory identification of these fungi.
7. Evaluate common diseases caused by yeast and various laboratory procedures for yeast isolation and identification.
8. Evaluate dematiaceous molds, give examples of diseases caused by these organisms and explain how they are isolated and identified.
9. Evaluate fungi that cause systemic mycosis, give examples of diseases caused by these organisms and explain how they are isolated and identified.
10. List recommended treatment protocols.

XIII. Clinical virology
1. Compare and contrast viruses with bacteria.
2. Describe sample collection and transport for optimum virus isolation.
3. List common viral pathogens.
4. Evaluate the various methods used in the diagnosis of viral infections.
5. Define cytopathic effect and its use in laboratory tests for viruses.
6. Describe antiviral therapy and the role of the laboratory in drug titration and drug resistance determination.
7. Evaluate the etiology and disease causation of human viral pathogens.
8. List recommended treatment protocols.

XIV. Quality control
1. Define quality control in clinical microbiology
2. Discuss general guidelines for establishing quality control
3. Assess implementation of quality control in clinical microbiology
4. Define the following quality control terminology: analytical sensitivity; analytical specificity, clinical sensitivity, clinical specificity, predictive value, accuracy

XV. Emergent technologies
1. Compare and contrast the application of agglutination, precipitation, immunofluorescence, radioimmunoassay, optical immunoassay and enzyme immunoassay in clinical
microbiology.
2. List several examples of microbiological diseases that are currently diagnosed by immunological methods in the laboratory.
3. Assess the significance of rapid methods of identification in clinical microbiology
4. Examine the principles behind rapid enzymatic tests that utilize chromogenic Substrates.
5. Describe the Vitek and Microscan automated systems.
6. Evaluate the application of chromatographic techniques to the identification of microorganisms.
7. Assess the role of nucleic acid probes in clinical microbiology.
8. Name common DNA/RNA probe labels.
9. Describe the use of nucleic acid probes in the rapid identification of infectious diseases.
10. Compare and contrast diagnosis of infectious diseases with nucleic acid probe technology with conventional methods.
11. Evaluate extended spectrum beta lactamase testing.

XVI. Spirochetes
1. Describe the genus Leptospira.
2. Evaluate the disease etiology of leptospirosis.
3. Describe the genus Borellia.
4. Evaluate the disease etiology of lyme disease.
5. Describe the genus Treponema.
6. Evaluate the disease etiology of syphilis.
7. Explain laboratory diagnosis of spirochetes.
8. List recommended treatment protocols.

XVII Chlamydia, Mycoplasma and Ureaplasma
1. List members of the chlamydia family.
2. Describe the growth cycle and characteristics of chlamydia.
3. Evaluate diseases caused by members of the chlamydia family and modes of transmission.
5. Describe the general characteristics of mycoplasma.
6. Evaluate the etiology of diseases caused by mycoplasma and ureaplasma.
7. Discuss laboratory identification of mycoplasma.
8. List recommended treatment protocols.

XVIII Agents of Bioterror
1. List the common organisms associated with bioterror.
2. Describe the biosafety levels of laboratory.
3. Describe the general characteristics of bioterror agents and associated clinical symptoms.
4. List common toxins listed under bioterror agents.
5. Compare the roles associated with bioterror agents between sentinel labs, reference labs, and national laboratories.
LABORATORY OBJECTIVES:
Upon completion of this course and without the aid of notes or textbook, the student should be able to achieve the following. Achievement will be met when a minimum score of 70% percent is earned as detailed in the methods of evaluation section of this syllabus.

1-Quality Control & Quality Assurance
1. Define quality control and quality assurance and differentiate between them.
2. Design a logbook for maintaining quality control records for:
   a. Reagents
   b. Media
   c. Stains
   d. Equipment
3. Give examples of internal and external types of quality control.
4. Identify the agencies responsible for
   a. Certification of medical technologists
   b. Setting laboratory standards for antimicrobial susceptibility testing
   c. Inspection and certification of labs
5. Describe the appropriate steps to take if quality control tests fall outside of expected results.
6. Take a package insert, prepare and present a power point overview for the quality control required for the selected procedure in microbiology.

2-Antimicrobial Susceptibility Testing
1. Describe and perform the Bauer-Kirby disk diffusion method of susceptibility testing.
2. Interpret the zone size results of a Bauer-Kirby disk diffusion test.
3. Distinguish between a Gram-positive antimicrobial and a Gram-negative susceptibility panel.
4. List the three bacteria used to control the quality of the Bauer-Kirby disk diffusion susceptibility test.

3-Acid Fast Bacilli
1. Perform the Auramin/Rodamine Stain and review positive and negative control using a fluorescent microscope.
2. Perform the Kinyoun’s Stain procedure and review positive and negative control using the compound microscope.
3. Compare the conventional biochemical testing to high performance liquid chromatography and genetic probe methods.

4-Parasitology
1. Given wet-mounts and trichrome stained preparations of patient samples, be able to identify the following parasites: Trichuris trichuria, Ascaris lumbricoides, hookworms, Taenia species, Diphyllobothrium latum, Schistosoma species, E. histolytica, E. coli, G. lamblia, T. vaginalis, Balantidium coli, Trypanosoma species and Plasmodium species.
2. Answer the following questions:
   a. The full name of the parasite
   b. genus and species
   c. the appropriate lab sample
   d. the mode of transmission
   e. the major disease associated with the specific parasite
   on the following organisms: Trichuris trichuria, Ascaris lumbricoides, hookworms, Taenia species, Diphyllobothrium latum, Schistosoma species, E. histolytica, E. coli, G. lamblia, T. vaginas, Balantidium coli, Trypanosoma species and Plasmodium species.

5-Anaerobic
1. Describe the environmental conditions required by anaerobic bacteria.
2. Recognize the following organisms as anaerobic bacteria and state the Gram-stain reaction of each and describe the appearance of spores.
   a. Peptostreptococcus magnus
   b. Bacteroides fragilis
   c. Clostridium perfringens
   d. Clostridium sordellii
3. Explain the purpose of various anaerobic media and broth media
4. Evaluate anaerobic identification tests when given a description of test results or the technique used to perform the procedure.

6. Culture and use anaerobic techniques to isolated and identify anaerobes.

6-Lower Respiratory Tract Culture Techniques
1. List the organisms commonly associated with lower respiratory tract infections.
2. Describe the various specimen collection techniques for lower respiratory samples and the relative merits of each.
3. Differentiate normal flora from pathogens in sputum cultures.
4. Collect and process a routine sputum specimen.
5. Interpret the Gram stain of a routine sputum smear for suitability for culture.
6. Select and interpret the correct biochemical tests for the identification of common respiratory pathogens and perform susceptibility testing as needed.

7-Upper Respiratory Tract Infections Throat Cultures
1. Identify the most common pathogen associated with bacterial pharyngitis.
2. Perform a routine throat culture.
3. Identify normal oral flora on a throat culture plate.
4. Describe special throat culture requests and what media would be used in their set-up.
5. Properly report a routine throat culture.
6. Perform and interpret a rapid identification test for group A beta-streptococcus.

8-Cerebral Spinal Fluid and Other Body Fluids
1. Define meningitis, encephalitis, and meningoencephalitis.
2. Explain the prevalence of encapsulated bacteria as causes of acute meningitis.
3. Describe the symptoms of acute bacterial meningitis in the adult and infant.
4. Describe chronic meningitis.
5. Describe the cellular and chemical composition of cerebral spinal fluid that is characteristic of acute bacterial meningitis, tuberculosis meningitis, and viral meningitis.
6. Identify the bacteria most commonly associated with meningitis in each age group.
7. Describe the collection, transport, and routine processing of cerebral spinal fluid specimens.
8. List other sterile body fluids that are received in the lab and describe how they are processed.
9. Describe the method used to detect bacterial polysaccharide antigens in cerebral spinal fluid.
10. Describe the processing of cerebral spinal fluid for mycobacterial culture.
11. Process an unknown cerebral spinal fluid specimen correctly and plate it on primary media.
12. Culture and identify a bacterial pathogen from an unknown cerebral spinal fluid specimen, selecting the appropriate tests for identification.

9-Blood Cultures
1. Compare and contrast transient, intermittent, and continuous bacteremia.
2. Define septicemia and septic shock.
3. Define endocarditis and line sepsis.
4. Explain the most common agents of endocarditis and catheter-associated infections.
5. Describe the correct method of collecting blood specimens for culture.
6. Complete the following recommendations pertaining to blood cultures:
   a. Volume of blood collected
   b. Number of cultures collected
   c. Timing of cultures
7. Describe the conventional blood culture technique by addressing medium composition, blood to broth ratio, and length of incubation before discarding.
8. Evaluate the procedure performed on conventional blood culture bottles after incubation for 6-18 hours, 12-24 hours, 2-6 days, and 7 days.
9. Describe how to work up a visually and an automated positive blood culture.
10. Explain the importance of preliminary reporting of blood culture results.
11. List supplements that can be added to conventional blood culture media.
12. Discuss special methods used to isolate Brucella, Leptospira, Mycobacterium aviumintracellulare, and nutritionally variant streptococci from blood.
13. Describe the following blood culture systems:
    a. Bactec
    b. Bac-T/Alert
14. Perform a Gram stain on a positive and negative blood culture and describe the appearance of each under the microscope.
15. Isolate and identify a bacterium growing in a positive blood culture.

10-Stool Culture Techniques
1. State the biochemical characteristics used to identify each of the enteric pathogens: Salmonella, Shigella, Campylobacter and E-coli O157:H7.
2. Choose and indicate the purpose of each plating medium used for routine stool culture.
3. Recognize the colonial morphology of stool pathogens and differentiate them from normal stool flora.
4. Describe the collection and processing of a routine stool specimen.
5. Discuss the theory of and perform serotyping of selected organisms.
6. Isolate and identify positive and negative stool cultures.

11-Skin and Wound Infections
1. Associate types of skin and wound infections with the organisms most commonly isolated.
2. Describe the procedure for processing wound cultures.
3. Isolate and identify anaerobes by both conventional and rapid identification methods.
4. Perform and interpret a Gram stain from each unknown specimen.
5. Isolate each type of bacterium and obtain pure cultures from a polymicrobial specimen.

**12-Urine Cultures**
1. Predict what organisms are likely to cause urinary tract infection.
2. Distinguish between bacteria that are potential urinary tract pathogens and those that are not.
3. List the normal urethral flora of the male and female.
4. Describe the different types of urine specimens received in the lab and proper collection methods.
5. Explain how to interpret colony counts from the different specimen types.
6. Explain how to work up bacteria with different specimen types.
7. Describe how to work up bacteria with different colony counts from clean-catch urine specimens.
8. Correctly work up isolates from two unknown urine cultures and report the results on the lab slips.
9. Compare and contrast commercial identification system for Enterobacteriaceae to the standard tube ID method.
10. Explain the significance of low colony counts in urine specimens from symptomatic females.
11. Describe the leukocyte esterase dipstick test and its combined use with the nitrite test.
12. Isolate and identify positive and negative urine cultures.

**13-Genital Tract Infections**
1. State which organisms(s) are routinely cultured for from genital tract specimens using routine bacteriologic media.
2. Explain the various agents causing genital disease and the techniques used to diagnose them.
3. State the types of specimens that are submitted for culture of *Neisseria gonorrhoeae*.
4. Explain the types of specimens submitted for the isolation of *Chlamydia trachomatis* and Herpes simplex and the technique used to culture these two agents.
5. Discuss the isolation of *Neisseria gonorrhoeae* in relation to:
   a. Methods of transporting specimens
   b. Media
   c. Incubation conditions
   d. Identification procedures
6. Perform, read, interpret, and report urethral and cervical Gram stains. Evaluate normal smears would look like as well as smears from patients with *Neisseria gonorrhoeae*.
7. State the type of specimen and medium used to isolate the following organism. Would culture of these agents be done routinely or by special request only? Why?
   a. *Streptococcus agalactiae*
   b. *Staphylococcus aureus*
   c. *Haemophilus ducreyi*
   d. *Gardnerella vaginalis*
8. Identify negative and positive genital tract culture.

**14-Methicillin Resistant Staphylococcus aureus (MRSA) and VRE**
1. Identify the types of specimens most commonly submitted for MRSA and VRE.
2. Describe the procedure for processing MRSA and VRE cultures.
3. Identify positive and negative results for MRSA and VRE cultures.
4. Perform a D-test.
5. Isolate and identify positive and negative MRSA and VRE cultures.

15-Mycology
1. Prepare and interpretation KOH preparation for fungal elements in clinical specimens.
2. Prepare and interpret an India ink test for encapsulated yeast.
3. Prepare and examine a tease mount of a mold culture to determine the morphologies of conidiophores and conidia.
4. Prepare and interpret positive and negative germ tube test preparation.
5. Describe the macroscopic and microscopic morphologies of opportunistic molds.
6. Identify and describe the differential characteristics of selected morphologies of opportunistic molds.
7. Describe the macroscopic and microscopic morphologies of dermatophytes.
8. Identify and describe the differential characteristics of selected dermatophytes.
9. Describe the macroscopic and microscopic morphologies of yeast.
10. Identify and describe the differential characteristics of selected yeast.
11. Describe the macroscopic and microscopic morphologies of the room-temperature phase and the 37°C phase of the systemic molds.
12. Explain how to differentiate the dimorphic systemic molds form each other.
13. Explain and interpret the use of BBL CHROMagar for Candida.

LEARNING ACTIVITIES:
Students will be given the opportunity to learn from:
A. Laboratory exercises
B. Formal lectures and notes taken during lectures or downloaded from WebCT
C. Participation in online learning activities offered via WebCT
D. Demonstrations and observations
E. Student Presentations
F. Audio-visual materials
G. Student text book and other reference materials
H. Homework and assigned reading materials
I. Computer assisted instruction units

Grading Policies
The final grade for this course will be the sum of all grades obtained in the following sections:

Lecture (70%)
  a. Four tests at 9% each..........................................................36%
  b. Study questions..............................................................5%
  c. Case studies.................................................................5%
  d. Quizzes............................................................................5%
  e. Final comprehensive exam..............................................19%

Laboratory (27%)
  a. Two lab practical tests at 8% each.....................................14%
b. Final practical exam.........................................................10%
c. Study questions.................................................................3%

Affective behavior (3%) ...........................................................3%

TOTAL 100%

A = 90 - 100%; B = 80 - 89%; C = 70 - 79 %; D = 65 - 69; F = 0 – 65

Grades of D or F do not meet acceptable program standards.

All lecture and laboratory exams will cover material presented in lecture and in the laboratory.

Students must pass both the lecture and laboratory portions of the course with at least a "C" average. Should a student not receive a passing grade in lecture or lab section, the lower of the two grades will be used to calculate the final grade.

Calendar of Activities

Include in this section a table or list that provides information for students regarding important dates, assignments or activities. The UTRGV academic calendar can be found at http://my.utrgv.edu at the bottom of the screen, prior to login. Important dates for Fall 2015 include:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 18th</td>
<td>MLK Holiday; university closed</td>
</tr>
<tr>
<td>January 19th</td>
<td>Classes Begin</td>
</tr>
<tr>
<td>Feb. 3rd</td>
<td>Last day to drop a class before it appears on the transcript and counts toward the “6-drop” limit. Last day to receive a 100% refund for dropped classes (other policies apply when a student is withdrawing from all classes).</td>
</tr>
<tr>
<td>April 13th</td>
<td>Drop/Withdrawal Deadline; last day for students to drop the course and receive a DR grade. After this date, students will be assigned a letter grade for the course that will count on the GPA.</td>
</tr>
<tr>
<td>May 5th</td>
<td>Study Day; no classes</td>
</tr>
<tr>
<td>May 6-12th</td>
<td>Final Exams (schedule is posted at my.utrgv.edu – check your scheduled time and list it on the syllabus)</td>
</tr>
</tbody>
</table>

ADDITIONAL REFERENCES:

1. Forbes, B.A. et. al.: *Bailey and Scott's Diagnostic Microbiology*
   C.V. Mosby, St. Louis, MO. 2007.
2. Koneman, E. W.et al.: *Color atlas and textbook of diagnostic microbiology*
5. Isenberg, H.D: *Essential Procedures for Clinical Microbiology*: ASM Press,

SOFTWARE

2. GermWare Bacteriology, CACMLE, Denver, CO, 1999.
4. IP Images Parasitology, Indiana Pathology Images, 2003
5. GermWare Mycology, CACMLE, Denver, CO, 1998.
6. IP Images Bacteriology Image Atlas, Indiana Pathology Images, 2005
7. IP Images Mycology Image Atlas, Indiana Pathology Images, 2004

STUDENTS WITH DISABILITIES:
If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time. **Brownsville Campus**: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at accessibility@utrgv.edu. **Edinburg Campus**: Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at accessibility@utrgv.edu.

**MANDATORY COURSE EVALUATION PERIOD:**
Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Online evaluations will be available April 13th, 2016-May 4th, 2016. Students who complete their evaluations will have priority access to their grades.

**ATTENDANCE:**
Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV’s attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

**COURSE REQUIREMENTS:**
1. Students are expected to attend each class session and to follow the attendance policies as described in the Student Standards and Expectations.
2. There will be no makeup for lab sessions without a written doctor’s excuse.
3. Students are responsible for being present for all exams. All exams will be announced at least one class meeting prior to examinations.
4. The student is expected to participate actively in each learning activity in lab and class sessions.
5. Lecture outlines will be available on Blackboard (http://onlinelearning.utrgv.edu) and students should print the appropriate outlines for class use prior to each scheduled lecture.
6. Students will be assigned certain tasks in the laboratory on a rotating basis which will be included as part of the affective evaluation.
7. All students must adhere to the safety rules of the laboratory. Students Will not be allowed to participate in the laboratory without proper attire. Gloves must be WORN at all times. Adherence to safety regulations will be evaluated as part of the affective grade.

**SCHOLASTIC INTEGRITY:**
As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism, and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

**SEXUAL HARASSMENT, DISCRIMINATION, and VIOLENCE:** *Required on all syllabi. Do not modify.*
In accordance with UT System regulations, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual
assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

COURSE DROPS: Recommended on all syllabi; may be modified by the instructor as long as it is not inconsistent with UTRGV policy.
According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

University policy requires all electronic communication between the University and students be conducted through the official University supplied systems; namely UTRGV Mail for email or Blackboard for course specific correspondence. Therefore, please use your UTRGV assigned Mail or Blackboard account for all future correspondence with UTRGV faculty and staff.

CLINICAL MICROBIOLOGY II (CLSC 4631)
TENTATIVE LECTURE SCHEDULE
SPRING 2016

DATE LECTURE TOPIC READING ASSIGNMENT*

<table>
<thead>
<tr>
<th>DATE</th>
<th>LECTURE TOPIC</th>
<th>READING ASSIGNMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 19-21</td>
<td>Antimicrobial susceptibility testing</td>
<td>Chapter 12/13 (E-1)</td>
</tr>
<tr>
<td>Jan. 25-26</td>
<td>Anaerobes</td>
<td>Chapter 22 (E-1)</td>
</tr>
<tr>
<td>Jan. 27</td>
<td>Microbiology quality control</td>
<td>Chapter 5 (E-1)</td>
</tr>
<tr>
<td>Jan. 28-Feb 1</td>
<td>Mycobacteria</td>
<td>Chapter 26 (E-1)</td>
</tr>
<tr>
<td>Feb. 2-4</td>
<td>Upper &amp; lower respiratory tract infections</td>
<td>Chapter 32 (E-2)</td>
</tr>
<tr>
<td>Feb. 12th</td>
<td>Micro Exam I (Section I study questions / Case studies due)</td>
<td></td>
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<tr>
<td>Feb. 8-11</td>
<td>Vibrio, Aeromonas Plesiomonas &amp; Campylobacter</td>
<td>Chapter 20 (E-2)</td>
</tr>
<tr>
<td>Feb. 8-11</td>
<td>Gastrointestinal tract infections</td>
<td>Chapter 34 (E-2)</td>
</tr>
<tr>
<td>Feb. 15</td>
<td>CNS infections</td>
<td>Chapter 35 (E-2)</td>
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<tr>
<td>Feb. 16-17</td>
<td>Bacteremia</td>
<td>Chapter 36 (E-2)</td>
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<tr>
<td>Feb. 18</td>
<td>Urinary tract infections</td>
<td>Chapter 37 (E-2)</td>
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<tr>
<td>March 4th</td>
<td>Exam 2 (Section II study questions / Case studies due)</td>
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<tr>
<td>Feb. 22-25</td>
<td>Skin and soft tissue infections</td>
<td>Chapter 33 (E-3)</td>
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<tr>
<td>Feb. 29-Mar. 3</td>
<td>Sexually transmitted diseases</td>
<td>Chapter 38 (E-3)</td>
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<tr>
<td>Mar 7-10</td>
<td>Intro medical mycology/specimen collection</td>
<td>Chapter 27 (E-3)</td>
</tr>
<tr>
<td>Mar. 7-10</td>
<td>Agents of superficial mycosis/dermatophytes</td>
<td>Chapter 27 (E-3)</td>
</tr>
<tr>
<td>Mar. 7-10</td>
<td>Agents of subcutaneous/systemic mycosis</td>
<td>Chapter 27 (E-3)</td>
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</table>

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March 14-18  Spring Break
Mar. 21-24  Agents of opportunistic fungal infections/yeasts Chapter 27 (E-3)

April 1
Exam 3 (Section III study questions/Case studies due)
Mar. 21-24  Agents of opportunistic fungal infections/yeasts Chapter 27 (E-3)
Mar. 21-24  Agents of opportunistic fungal infections/yeasts Chapter 27 (E-3)
March 28-30  Clinical Virology Chapter 29 (E-4)
Mar. 31  Spirochetes Chapter 23 (E-4)
April 4-11  Chlamydia, Mycoplasma & Ureaplasma Chapter 24/25 (E-4)
April 12-18  Zoonotic and rickettsial infections Chapter 40 (E-4)
April 19  Immunodiagnosis of Infectious Diseases Chapter 10 (E-4)

April 22
Exam 4 (Section IV study questions / Case studies due)
April 20-May 3  Chapter 30 Agents of Bioterror (F)

TBA Final Exam

* Students must read the above indicated chapters in their lecture textbook (Textbook of Diagnostic Microbiology) prior to lectures
E=Exam, F=Final

MICROBIOLOGY IN HEALTH CARE (CLSC 4631)
TENTATIVE LABORATORY SCHEDULE
Spring 2016

<table>
<thead>
<tr>
<th>DATE</th>
<th>LABORATORY TOPIC</th>
<th>READING*</th>
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<tbody>
<tr>
<td>Jan 19-21</td>
<td>Parasitology and Quality Control</td>
<td>Chapter 7 p. 17</td>
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<td>Chapter 3, Ex 23</td>
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<tr>
<td>Jan. 20-21</td>
<td>Antimicrobial Susceptibility Testing</td>
<td>Chapter 14, Ex 21</td>
</tr>
<tr>
<td>Jan 26-28</td>
<td>Anaerobes</td>
<td>Chapter 19-20</td>
</tr>
<tr>
<td>Jan 27-28</td>
<td>Mycobacteria</td>
<td>Handouts</td>
</tr>
<tr>
<td>Feb 2-4</td>
<td>Throat and Sputum Cultures</td>
<td>Ex. 28 &amp; 29</td>
</tr>
<tr>
<td>Feb. 9-11</td>
<td>CSF, Blood Cultures &amp; Body Fluids</td>
<td>Ex. 24 &amp; 25</td>
</tr>
<tr>
<td>Feb.16-18</td>
<td>Urine Cultures</td>
<td>Ex. 26</td>
</tr>
<tr>
<td>Feb. 23-25</td>
<td>Stool Cultures</td>
<td>Ex. 27</td>
</tr>
<tr>
<td>Feb. 23-25</td>
<td>Vibrio/Campylobacter</td>
<td>Chapter 8</td>
</tr>
<tr>
<td>March 1-3</td>
<td>Laboratory Practical- I</td>
<td></td>
</tr>
</tbody>
</table>
Mar 8-10  MRSA/VRE (wound culture)  Handouts

**March 14-18**  Spring Break-No Classes

March 22-24  Genital Tract Infections  Ex. 31

Mar 29-31  Laboratory Identification of Filamentous Fungi  Med. Mycology

Apr 5  Laboratory Identification of Filamentous Fungi  Med. Mycology

**April 12-14**  Lab Practical- II

April 19-21  Laboratory Identification of Filamentous Fungi and of yeast  Med. Mycology

April 26-28  Final Comprehensive Practical

*Students must read the above-indicated exercises in their laboratory manual (Laboratory workbook in Diagnostic Microbiology), Medical Mycology, Medical Parasitology and WebCT (Ex) handouts prior to lab.*