MELT 2601: Diagnostic Microbiology

A. COURSE DESCRIPTION
   Credits: 5
   Lecture Hours/Week: 3
   Lab Hours/Week: 2
   OJT Hours/Week: *.*
   Prerequisites:
   This course requires either of these prerequisite categories
   1. BIOL 1416 - Essentials of Anatomy and Physiology
      Or
   2. Both of these
      BIOL 1417 - Human Anatomy & Physiology I
      BIOL 1419 - Human Anatomy and Physiology II
   Corequisites: None
   MnTC Goals: None

   This is a medical diagnostic microbiology course, with emphasis on bacteriology. The microorganisms most frequently isolated in the clinical laboratory are studied along with methods used in their identification. Susceptibility testing and anaerobes are also included. The culture and work-up of clinical specimens is practiced, providing an in-depth study of the interpretation and reporting of microbiology cultures on clinical specimens. Microorganisms other than bacteria are then studied beginning with parasites. Mycobacteria, Mycoplasma, Chlamydia, Rickettsia, viruses and fungi are also studied. This course is restricted to medical lab tech students. Prerequisite: BIOL1416 or BIOL1417 and BIOL1419.

B. COURSE EFFECTIVE DATES: 08/25/2014 - Present
C. OUTLINE OF MAJOR CONTENT AREAS

1. Gain knowledge of the purpose of diagnostic microbiology and the role of the clinical microbiologist.
2. Practice safety while handling specimens and cultures.
3. Gain knowledge of the prokaryotic cell structure, nomenclature, virulence mechanisms, nutritional requirements, and environmental requirements.
4. Gain an understanding of infectious disease, including the factors necessary to establish infection and the role of normal flora in the pathogenesis of infection.
5. Gain knowledge of the control of microorganisms, including the use of safety precautions, the use of disinfectants and antiseptics, autoclaving, and levels of biosafety cabinets.
6. Gain an understanding of appropriate specimen collection, processing, transport, direct microscopic examination, and the appropriate media required.
7. Perform laboratory exercises demonstrating the presumptive characteristics and colony morphological characteristics from enriched, selective, and differential media aiding in the identification of bacteria.
8. Gain an understanding of the general characteristics, structural characteristics, virulence factors, disease states, colony morphology, and media characteristics of aerobic Micrococccaceae, Streptococcaceae, Neisseria species (spp.), Moraxella catarrhalis, Haemophilus spp., and Enterobacteriaceae.
9. Gain an understanding of the general characteristics, structural characteristics, virulence factors, disease states, colony morphology, and media characteristics of non-fermentative gram negative bacilli, miscellaneous gram negative bacilli, spore-forming and non-sporeforming gram positive bacilli, and anaerobic bacteria.
12. Gain an understanding of antibiotic susceptibility, beta-lactamase, and emerging antibiotic resistant strains of bacteria.
13. Perform a laboratory agar antibiotic disk diffusion exercise.
14. Perform an exercise to gain an understanding of the minimum inhibitory concentration (MIC) plate and the reading of a MIC plate.
15. Describe specimen collection and processing.
16. Interpret and report cultures on clinical specimens.
17. Select appropriate biochemical tests needed to identify organisms.
18. Identify the infective and diagnostic stage of pathogenic human parasites.
19. Demonstrate knowledge of nonbacterial microorganisms associated with human disease.

D. LEARNING OUTCOMES (General)

1. The learner will be able to set-up, differentiate, and identify pure cultures of aerobic bacterial organisms.
2. The learner will demonstrate knowledge of anaerobes and susceptibility testing.
3. The learner will exhibit introductory knowledge of viruses, fungi, and other nonbacterial microorganisms.
4. The learner will exhibit knowledge of methods to isolate & identify parasites from human specimens and relate the clinical significance.
5. The learner will interpret & report the results of cultures from various clinical specimens.
E. Minnesota Transfer Curriculum Goal Area(s) and Competencies
   None

F. LEARNER OUTCOMES ASSESSMENT
   As noted on course syllabus

G. SPECIAL INFORMATION
   None noted