DEBRE MARKOS UNIVERSITY

COLLEGE OF HEALTH SCIENCE

DEPARTMENT OF MEDICAL LABORATORY

MEDICAL BACTERIOLOGY COURSE SYLABLE

Course title/code: Medical Bacteriology II (MeLS3154)

Program :BSc in Medical laboratory science

Module title/ code medical microbiology II (MeSL-M3153)

Course description:

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| This course describes methods of collection, transportation and processing of clinical samples and examination of medically important pathogenic bacteria (Gram positive cocci; gram positive rods, Gram negative cocci; Gram negative coccobacilli; Enterobacteriace, other gram negative rods; Spirochates; Chlamydiae; Mycobacterium; Rickettsiae; Mycoplasma and other miscellaneous bacteria). It illustrates srategies in laboratory diagnosis of infective syndromes (the investigation of gastrointestinal infections, Urinary tract infections, wound infections, respiratory infections, Sexually transmitted diseases, meningitis and miscellaneous infections) and Quality Assurance in Bacteriology laboratory.   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **General Objective:**   * At the end of this course, students will be able to discuss medically important bacteria (general characteristics, virulence factors, clinical manifestations, laboratory diagnosis, prevention and control); perform clinical specimen collection, processing and examination; identify bacterial pathogens; report laboratory results and ensure its quality and maintain laboratory safety throughout diagnosis and follow up of patients**.**  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Instructional Objectives**  **Knowledge**   * 1.  Describe types of specimens used for bacteriological analysis   2.  List the medically-important species of bacteria   3.  Identify diseases caused by medically important bacterial species   4.  Describe the virulent factors of pathogenic species   5.  Discuss the common pathogenic bacteria species(pathogenicity, clinical manifestations, laboratory diagnosis, prevention & controlling methods)   **Skill**   * 1.  Perform collection, transportation, & storage of clinical specimen;   2.  Perform clinical specimens processing, examination and identify bacterial pathogens   3.  Follow safety rules and standard operational procedures in order to ensure quality in bacteriology laboratory  |  |  |  |  | | --- | --- | --- | --- | | Pre-requisite(s) | | **Medical Bacteriology I (**MeLS3153**)** | | | Course Status | | Core | | | Mode of Delivery | | s/based | | | **Schedule** | | | | | **Days** | **Contact Hour** | Topics and Sub Topics | References  (Number ) | | **Day 1** | 4 Hr. | **Lecture:**   1. 14. Introduction    1. 14.1. Types of specimen for bacterial analysis Specimen collection    2. 14.2. Transportation    3. 14.3. Storage    4. 14.4. examination of clinical specimens | **1&7** | | 4hr | | **Lab:** Preparation of materials for specimen collection | | | 4hr | | **Independent study:** | | | **Day 2** | 4 hr | **Lecture**   1. **15. Medically important bacteria**     1. 15.1. General characteristics    2. 15.2. Virulent factors    3. 15.3. Pathogenecity and clinical manifestations    4. **15.4.** Lab diagnosis Prevention & control | **2,8&3** | | 4hr | | **Lab:** specimen collection, transportation and storage | | |  |  |  |  |  | | --- | --- | --- | --- | | 4hr | **Lecture**   1. **16. Pathogenic gram Positive cocci**     1. 16.1. staphylococci    2. 16.2. Streptococci    3. 16.3. micrococci    4. 16.4. Enterococci | | **2&5** | | 3hr | | **Lab:** media preparation and inoculation gram positive cocci | | | 1hr | | **Assessment:** Exam one | | | 4hr | | **Independent study:** | | | **Day 4** | 4hr | **Lecture**   1. **17. Gram-positive rods**     1. **17.1. Bacillus**    2. **17.2. Clostridium**    3. **17.3. Listeria**    4. **17.4. Corynebacteria** | **9&10** | | 4hr | | Lab:   1.  Identification of gram positive cocci 2.  **Media preparation and inoculation of gram positive rods** | | | 4hr | | **Independent study:** | | | **Day 5** | 4 hr | | **Lecture**   1. **18. Pathogenic gram negative cocci**     1. **18.1. Neisseria**    2. **18.2. Moraxella** |  |  |  |  |  | | --- | --- | --- | --- | | 3hr | | Lab:   1.  Identification of gram positive rods 2.  **media preparation and inoculation of gram negative cocci** | | | 2hr | | **Assessment:** Exam two | | | 3 hr | | **Independent study:** | | | **Day 6** | 4hr | **Lecture:**   1. **19. Pathogenic gram negative coccobacilli**     1. **19.1. Haemophilus**    2. **19.2. Brucella**    3. **19.3. Bordetella** | **5&10** | | 3hr | | Lab:   1.  Identification of gram negative cocci | | | 3hr | | **Independent study:** | | | **Day 7** | 4hr | 1. **20. Gram negative rods**     1. 20.1. Enterobacteriaceae    2. 20.1.1. characteristics of enterobacteriaceae    3. 20.1.2. Escherichia coli    4. 20.1.3. Klebsiella | **2,5** | | 4hr | | Lab:   1.  **Media preparation and inoculation of gram negative rods *( E. coli,* Shigella, salmonella etc)** | |  |  |  |  |  | | --- | --- | --- | --- | | **Day 8** | 4hr | **Lecture**   * 1. 20.1.4. Citrobacter   2. 20.1.5. Entrobacter   3. 20.1.6. Proteus   4. 20.1.7. Serratia   5. 20.1.8. Yersinia | **2&5** | | 3hr | | Lab:   1.  **Colony characteristics and biochemical inoculation gram negative rods** | | | 3hr | | **Independent study:** | | | **Day 9** | 3hr | **Lecture**   * 1. 20.1.9. Salmonella   2. 20.1.10. Shigella | **2&5** | | 4hr | | Lab:  **identification and AST of gram negative rods** | | | 3hr | | **Independent study:** | | | **Day 10** | 3hr | **Lecture**   1. **21. Other gram-negative rods**     1. **21.1. The Pseudomonas**    2. 21.2. Vibrio species    3. 21.3. Campylobacter    4. **21.4. Helicobacter** | **2&3** |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 4hr | | | Lab:   1.  **AST reading and reporting of gram positive rods** | | | | 2hr | | | **Independent study:** | | | | 2hr | | | **Assessment** :Exam three | | | | **Day 11** | 3hrs | | **Lecture:**   1. **22. Mycobacterium**     1. 22.1. M. tuberculosis complex    2. 22.2. M leprae | | **10** | | 3hr | | | Lab: **AFS of sputum**  **Inoculation of wound specimen** | | | | 4hr | | | **Independent study:** | | | | **Day 12** | | 4hrs | | **Lecture**   1. **23. Miscellaneous**     1. 23.1. Chlamydia    2. 23.2. Mycoplasma    3. 23.3. Legionella    4. 23.4. Rickettsia | | | - | | | **Assignment submission** | | | | 3hr | | | **Lab:**   1.  Colony characteristics and biochemical test | | | | 5hr | | | **Independent study:** | | | | 3hrs | | **Lecture** | | **3&9** | |  |  |  |  |  | | --- | --- | --- | --- | | **Day 13** | | 1. **24. Quality Assurance in Bacteriology**     1. 24.1. Pre-analytical quality assurance    2. 24.2. Analytical quality assurance    3. 24.3. Post-analytical quality assurance | | | 3hr | | **Lab:**   1.  Identification and AST | | | 6hr | | **Independent study:** | | | **Day 14** | 8hrs | | Tutorial ( practical and theory) | | 4hr | | **Independent study** | | | **Day 15** | 12 | | **Independent study** | | **Day 16** | 7 hrs | | **Independent study** | | (2+3) hr | | **Final exam ( practical + theory )** | | | **Teaching and Learning Methods**   1.  Lecture/Classroom contact 2.  Presentation and group discussion 3.  Computer assisted instruction 4.  Laboratory practical  |  |  |  |  | | --- | --- | --- | --- | | **Assessment** | **Type and Weight (Percentage)**  Exam I …………………10%  Exam II…………………10%  Assignment …………… 10%  Exam III………………...10%  Lab. Report………....…..10% | | **Competence to be assessed**   1.  Identify appropriate specimen 2.  Proper storage of specimen 3.  Maintain the quality of specimen 4.  Describe the pathogenesis and clinical manifestation of pathogenic bacteria 5.  Technical skill in the Lab diagnosis of bacteria 6.  Isolate pathogenic bacteria. 7.  Practice under safety and quality principles | | Final Examination (theory 40% and practical 10%) | | | | | Course Policy | | **Attendance**:   1.  Students are expected to attend each class. Your attendance determines whether you sit for exam or not as per university legislation. 2.  100% laboratory practice is mandatory | | | **Reference (s)** | | **Required texts:**   |  | | --- | | 1. 1. Patrick R. Murray, Ken S. Rosenthal, George S. Kobayashi, Michael A. PfAller. Medical microbiology fourth Edition. Mosby, Inc. 2002. 2. 2. Jawetz, Mel nick, Adel berg’s Geo.F. Brooks, Janet S. Butel, Stephen A.Morse. Medical Microbiology twenty-first edition. Appleton and Lange Stamford, Connecticut 1995. 3. 3. Cheebrough M. Medical Laboratory manuals for tropical countries volume II. Tropical health technology /Butter worth – Heinemann 1991. 4. 4. Boyd R. Basic Medical Microbiology Fifth edition. Lippincott company 1995. 5. 5. Mackie and McCartney. Practical medical microbiology 13th edition. Churchill Livingston 1989. 6. 6. Bernand D. Davis, Renato Dulbecco, Herman N. Eisen and Harold S. Ginsberg. Microbiology fourth edition. Lipinocott Company 1990. 7. 7. Bob A. Freeman. Burrows Text book of microbiology twenty-second edition. W.B. Saunders Company 1985. 8. 8. Gillies.R.R. Lecture notes on medical microbiology second edition. Black Well Scientific publications 1978. |   9. Cheesbrough, M. (1998) District Laboratory Practice in Tropical Countries. Part 2 Cambridge University Press.   1. 10. B. Patrick Murray, Ken S. Rosenthal, Michael A. Pfaller. (2005) Medical Microbiology 5th edition 2. 11. Baron S (2000) Medical Microbiology 4th edition.   12. Abilo T., Meseret A. Medical Bacteriology Lecture note for Medical Laboratory | | | | | | | |