

Intro to medical technology assignment



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Course Learning Outcomes Upon completion of the course the student will be able to: 1. Appreciate the important role of the Medical Technologist in the saving of lives and relate that to the role of Jesus in the saving of souls. 2. Describe the different designations of laboratory professionals, the major Job functions, and the education requirements for entry into the profession. 3. Discuss the various aspects related to proper techniques, safety and interpretation of procedures presented. 4. Perform laboratory procedures taught utilizing correct techniques. 5.

Discuss proper specimen collection techniques. 6. Possess an introductory knowledge of the scope of testing performed in each of the following sections of the Clinical Laboratory: a. Hematology b. Microbiology c. Immunology d. Coagulation e. Nonmathematical f. Mycology g. Clinical Chemistry 7. Contribute to the overall improvement of the healthcare system. Instructional Procedures There will be one 80 minute lecture and a three-hour laboratory session weekly for approximately fifteen weeks. A short devotion will be conducted at the beginning of each class period.

There will be written tests, assignments, reading reports and one final comprehensive exam. In the case of absence, the University's absence policy applies (See NICE Bulletin). Students with excused absences who have missed assignments or tests must make them up within one week of returning to class. The laboratory component of this course will carry a Pass/Fail designation. Failure of the laboratory component results in an automatic failure of the course which must be repeated. A failing laboratory grade will not be included in the calculation of the overall grade for this course.

In this course, mastery is the goal, and the student is responsible for the information from assignments, text, manual, class discussion, other reading and laboratory procedures. No assignment should be placed beneath the office door unless otherwise specified by the instructor. In the case of absence, the University absence policy applies (See NICE Bulletin). Students with excused absences who have missed assignments or tests must make them up within one week of returning to class. Quizzes cannot be made up.

Integration of Faith and Learning Outcomes: 1 .

Demonstrate the fulfillment of God's manifestation in our lives as the study the of Clinical Laboratory Science highlights the amazing design of the human machinery and the God given skills required to thoroughly investigate it. 2. Exhibit behaviors that reflect an appreciation of health and wellness as tokens from God to be cherished and a commitment to assist others experiencing ill health through by our kills. " Knowledge is power, but it is a power for good only when united with true piety. It must be videlicet by the Spirit of God, in order to serve the noblest purposes. CAP p. 8. NICE Values and Attitudes: Focus 1. Christensen 2. Integrity 3. Justice Christensen: I, Fabian Pitting and all the students of MATCH: 106 Introduction to Medical Technology Laboratory class, commit to exercising the highest levels of Christensen in all actions during this semester in relation to the following: 1 Handling student issues in a fair and equitable manner 2 Displaying honesty with submitted work Displaying kindness to each other 4 Displaying humility, compassion and unselfishness to each other 5 Showing confidence in all things through Christ who strengthens me. Philippians 4: 13) Integrity: The facilitator and students will undertake learning experiences that exercise the

highest levels of integrity such as: Honoring deadlines in submission of assignments Practicing academic honesty with respect to the use of published works and other intellectual property Participating equally in group work and activities Good stewardship of tools, equipment and other resources in the teaching learning environment Give fair evaluation to student work Display proper deportment and conduct.

Justice: The facilitator and all students will exercise the highest level of Justice and fairness in all actions related to this course in the areas of: Fair grading for tasks submitted for evaluation Timely feedback and redress of inquiries, challenges, issues, grouses Impartial treatment of all students regardless of race, age, religious affiliation, nationality or ethnicity. Access to Computer and Internet Resources: Completing these course requirements necessitates regular access to computer technology and the Internet.

If a student does not have a personal computer with Internet access, computers on the University Main Campus and Extension Sites are available for student use. Civility, Courtesy and Respect: As professionals, mutual respect is required; the instructor expects all class members to communicate in a professional and courteous manner. While everyone may feel passionate about a particular subject and is entitled to his/her opinions, classroom discourse must always be conducted in a respectful and civil tone. No disrespectful or disparaging comments about gender, ethnicity, religion, et cetera will be tolerated.

Honor Code: Regulations on plagiarism and other forms of cheating are strictly enforced. Since engaging in either activity may result in very serious

penalties, including failing grades, or dismissal from the University, you should endeavour to avoid such activities. Any assignment or work submitted for this course must not have been submitted for any other course. No written or digitally authored work may be submitted for academic credit more than once. If you have questions about how this may apply to an assignment you are considering for this course, please ask the facilitator for clarification.

Students with a Disabling Condition: Any student who, because of a disabling condition, may require some special arrangements in order to meet course requirements, should communicate with the instructor in a timely manner, to seek such special considerations. Students should present appropriate verification from the relevant administrative office at the University. There is no guideline indicating that special considerations be given prior to completion of the existing university verification process.

Course Content
Lecture 1. Introduction to the Profession and Fundamentals of the Clinical Laboratory

No. Of Hours: One hour Instructional Objectives: At the end of the lecture the students will be able to:

1. Describe the evolution of Clinical Laboratory Science
2. Draw and describe the organizational structure of a healthcare organization
3. Name the departments of a clinical laboratory
4. Describe the various sites for laboratory testing
5. Describe the importance of regulations concerning the quality and reliability of laboratory work.
6. Describe the various categories of personnel in the clinical laboratory
7. Name and describe non-analytical and analytical factors in quality assessment. .
8. Describe proficiency testing.
9. Name three medical-legal issues and discuss

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issues associated with each. 10. Discuss the future directions for laboratory medicine. Content: 1. Functions of the clinical laboratory 2. Organization with the clinical laboratory 3. Regulatory bodies (OSHA, CLIA, etc) 4. Introduction to specialist areas of the clinical laboratory 5. Credentialing 6. Professional organizations 7. Quality Assessment Activities: 1 . Group work (Think/pair/share) – What is Medical Technology? What does it entail? 2.

Discussion – How important/ integral is this profession to the health care delivery system? Primary resource: Turn-on, Mary Louise. Clinical Laboratory Science 5th Edition. Missouri: Mosby Elsevier 2007 pig. 4-20 Lecture 2. Safety in the clinical laboratory, Specimen Collection, Transportation & Handling Laboratory No. Of Hours: One hour 1 . Describe the basic aspects of infection control policies, including how and when to use Apes and the reasons for using Standard Precautions. 2. Describe the procedure for decontaminating a work area and the steps to be employed when cleaning up hazardous spills. . Describe the basic steps if first aid. 4. Identify seven factors that should be monitored by quality assessment methods. . Demonstrate and describe the skills needed to interact with patients in the collection of specimens 6. Describe the principles and applications of Standard Precautions 7. Discuss general specimen preparation guidelines 8. Identify unacceptable laboratory specimens 9. Explain the chain of custody in specimen handling 10. Describe relevant medical-legal issues related to specimen collection 1 . Occupational Safety and Health Administration Acts and Standards 2.

Handshaking 3. Immunization 4. Prophylaxis 5. Exposure control 6.

Laboratory Hazards 7. General Infection control 1. Group work

(Think/pair/share) – Why is it so important to be minimized prior to entering

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into the clinical laboratory? 2. Discussion – What is the value of proper sample collection and handling to the generation of quality patient results? Missouri: Mossy Elsevier 2007 pag. 21-72 Assessment # 1 : This assesses knowledge, comprehension, and synthesis of facts and principles outline in the lecture. Assessment tools- Matching, Short Answers and Short essays.

Content Knowledge Comprehension Synthesis Total Lecture 1 10 20 50

Lecture 2 Lecture 3. Systems of measurement, Laboratory Equipment, and Reagents; The Microscope; Measurement Techniques in the Clinical

Laboratory No. Of Hours: One hour 1 . Convert metric units of measurement for weight, volume, and temperature to English units and metric units or metric units to English units. 2. Convert temperature from degrees Celsius to degrees Fahrenheit or Kelvin. 3. Describe the various types and uses of laboratory volumetric glassware, the techniques for their use, and the various types of glass used to manufacture them. . Describe types and uses of laboratory centrifuges. 5. Compare various forms and grades of water used in the laboratory and how each is each. 6. Demonstrate how to properly label a container used to store a laboratory reagent or solution. 7. Identify the parts of the microscope. 8. Explain the difference between magnification and resolution. 9. Define alignment, and describe the process of aligning a microscope. 10. Describe the procedure for correct light adjustment to obtain maximum resolution with sufficient contrast. 11 . Identify the four basic measurement techniques. 2. Describe the principle of absorbency spectrophotometer. 13. Explain how the intensity of color in a substance can be used to measure its concentration. 14. Define Beer's Law. 5. Name the components of the spectrophotometer. 16. Identify three quality control

tests for the spectrophotometers. 17. Describe the principle of enfeeblement. 1 . International Systems 2. Laboratory plasticizer and glassware 3. Laboratory balances 4. Laboratory centrifuges 5. Laboratory reagent water 6. Reagents used in laboratory assays 7. Use of the microscope 8. Photometry 9.

Absorbency spectrophotometer 10. Enfeeblement 1 1 . Electrochemical methods 1 . Group work (Think/pair/share) – Problem solving; converting Fahrenheit to Celsius to Kelvin and finding unknown concentrations using the Beer's law. Mission: Mossy Elsevier 2007 pig. 78 – 147 Lecture 4. Quality Assessment & Quality Control in the Clinical Laboratory, Central Laboratory Automation & Point-of-Care Testing, and Laboratory Information Systems 1 . Discuss how professional regulations require the implementation of quality assessment programs in the clinical laboratory. 2.

Identify the components necessary to a laboratory quality assessment program, including its quality control program and the use of control specimens 3. Assess the diagnostic usefulness of results reported, which requires an understanding of accuracy and precision as well as pacifistic and sensitivity, for laboratory tests and methodologies. 4. Explain the sources of variance in a laboratory procedure 5. Explain the importance of a quality control program, including the use of control samples, the determination of the control range, and the use of quality control charts 6.

Describe the use of reference values, including the use of the mean and the standard deviation in determination of the reference range. 7. Explain the major benefits of laboratory automation 8. Describe the five steps in

automated analysis 9. Compare the major advantages and disadvantages of point-of-care testing 10. Identify the four categories of Clinical Laboratory Improvement Amendments of 1988 (CLIA '88) test procedures 11. Provide examples of instrument-based point-of-care testing 12. Identify at least six characteristics to consider when selecting a point-of-care instrument. 13.

Describe overall product and functions of laboratory information systems 14. List and describe components of a computer system 15. Define the abbreviations LAN and WAN 16. Define and give examples of preindustrial and postindustrial testing 17. Identify and describe five Clinical Laboratory Standards Institute (CLSI) standards for sign, compatibility, and integration of automated clinical laboratory systems. 1. Clinical Laboratory Improvement Amendments 2. Accrediting Organizations 3. Quality assessment consideration 4. Quality assessment descriptors 5. Quality control statistics 6. Monitoring quality control 1.

Group work (Think/pair/share) – Problem solving: Laboratory statistics and generation of Levy Jennings chart. 2. Discussion – Practical ways of ensuring quality in the clinical laboratory Missouri: Mosby Elsevier 2007 pag. 161 -194 Lecture 5. Laboratory Mathematics and Introduction to Clinical Chemistry No. Of Hours: One hour 1. Calculate proportions and ratios 2. Calculate the requirements for solutions of a given volume and molarity 3. Describe the procedures for making a single dilution and a serial dilution 4. Calculate the amount of one solution needed to make a solution of a lesser concentration from it. 5. Differentiate the expressions of solution concentration weight per unit weight and weight per unit volume. 6. Prepare a percent solution 7. Compare the pathophysiology of types I and II diabetes. 8. Describe the

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symptoms of diabetes. 9. Identify the four major electrolytes found in blood and body fluids. 10. Name and compare renal function assays. 11. List the major lipid fractions. 12. List the major cardiac markers. 13. Describe liver and pancreatic assays and their significance. 14. Compare the clinical significance of various types of tumors markers. 15.