SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

ACADEMIC AFFAIRS

Course Number: CLLS 101 Department: Clinical Lab Science

Course Title: Intro. to the Clinical Lab Semester: Fall Year: 2014

Objectives/Competencies

Course Objective	Competencies
Student will define course and program expectations.	▪ Define objectives for the course, program, and profession and course expectations. ▪ Define the significance of a vocabulary list. ▪ List and describe the importance of the behavioral expectation of CLLS students.
Student will define and apply all safety protocols, universal precautions when practicing laboratory skills	▪ List and practice all safety protocols and apply universal precautions when performing laboratory skills in the student laboratory and on clinical affiliation.
Student will define the role of the clinical laboratory in healthcare and describe the qualifications of the personnel who work in the laboratory.	▪ Describe the typical organizational structure of a hospital laboratory and the function. ▪ List the departments within the laboratory and briefly explain the function of each. ▪ Identify personnel likely to be employed in a hospital laboratory including education level and work responsibilities
Student will list, define and give examples of the types and function of laboratory regulation.	▪ Differentiate between certification, licensure and registry. ▪ Identify the agencies involve in the Clinical Laboratory by name, acronym and describe their function. ▪ Define and explain the function, impact and/or medical legal issues

Course Objective	Competencies
	concerning: o Informed Consent o Confidentiality o Chain of Custody o Patient's Bill of Rights o HIPPA ▪ Differentiate between malpractice and negligence as it applies to the clinical laboratory. ▪ Identify situations in which laboratory professionals could be liable.
Student will define and describe the importance and applications of ethics and professionalism in the clinical laboratory	▪ Define ethics and professionalism. ▪ Compare and contrast professional and ethically acceptable and unacceptable behavior. ▪ Discuss the appropriate code of ethics for laboratory professionals. ▪ Explain the importance of being ethical and professional in the workplace. ▪ Explain how to handle laboratory errors.
Student will describe and perform proper specimen collection preparation, processing and transport.	▪ Explain the importance of specimen collection, processing, and preparation. ▪ Cite the proper procedure for collection of common types of laboratory specimens including: o QA and patient identification o Collection techniques and equipment o Labeling ▪ Describe precautions used when handling laboratory specimens and the importance of these procedures. ▪ Explain the types of routine specimens that are analyzed in the laboratory and the proper collection techniques and equipment.

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Student will identify, describe the function, use and maintenance and properly operate basic clinical laboratory equipment	▪ Discuss the procedure and use of the COC specimen collection. ▪ Explain the proper conditions for transporting of laboratory specimens. ▪ Identify, categorize and describe the use of the general types of laboratory glassware and name a distinguishing characteristic for each. ▪ Describe the types and use of plastic ware used in the laboratory. ▪ Identify, categorize and describe the use of the general types of laboratory pipettes and name a distinguishing characteristic for each. ▪ Given a set of laboratory conditions, select the appropriate piece of glassware or pipette. ▪ Differentiate between glassware which should be treated as TC (to contain) and TD (to deliver). ▪ Describe the proper method for cleaning glassware. ▪ Describe the types of balances available and their appropriate use. ▪ Differentiate the types of centrifuges and describe the function, components, use and proper operation. ▪ Define the following terms as they apply to operation of a centrifuge: o Rotations per minute o Relative centrifugal force ▪ Discuss the use and care of water baths. ▪ Define the principle and clinical use pH meter. ▪ Discuss use, care and operation of microscopes. ▪ Describe the types of microscopy and give at least one example of their use in the clinical lab. ▪ Name, locate and describe the function of the important components of the compound microscope. ▪ Define the following: o Refractive index

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	○ Resolving power ○ Parafocal ○ Intra-pupillary distance ○ Numerical Appeture ○ Working Distance ▪ Given the magnification of an ocular and an objective, the total magnification.
Student will describe the principles of Photometry and Spectrophotometry and apply these principles in laboratory procedure.	▪ Define the composition of white light and discuss the wavelengths in the visible spectrum of light. ▪ Describe the relationship between absorption and % transmittance. ▪ List, diagram and state the purpose of the main parts of the spectrophotometer. ▪ Identify sources of error when using a spectrophotometer. ▪ State the Lambert-Beer law. ▪ Graph %T or A versus concentration data from values obtained from standard and calculate the value for the unknown.
Student will describe use, list formula, perform computations and apply to laboratory procedures basic laboratory math calculations.	▪ Explain the use of laboratory calculations ▪ Discuss S.I. system and identify the basic units of measurements in the metric system ▪ Describe significant figures and how they are utilized within the laboratory. ▪ Explain ratios and proportions and accurately perform calculations. ▪ Discuss relationship of temperature scales and convert temperatures from one scale to another. ▪ Define and distinguish between a solution and its components. ▪ Explain the concept of percent solutions and apply it to the three types of percent solutions.

Course Objective	Competencies
	▪ Solve percent calculations involving w/w, v/v, and w/v solutions. ▪ Describe how to prepare percentage solutions. ▪ Solve problems involving use of stock solutions to prepare a more dilute solution. ▪ Discuss the types of dilutions and solve single dilution calculations.
Student will define all quality processes and describe, apply and/or perform Quality Assurance and Quality control in clinical laboratory procedures.	▪ Define and describe the components quality management systems(QMS), quality assurance (QA) and quality control(QC). ▪ Identify the purpose of QMS, QA and QC within the laboratory ▪ Explain the organization of a laboratory manual and discuss the importance of standard operating procedures within the laboratory ▪ Define and discuss the importance of the general parameters which should be monitored in a quality control system. ▪ Differentiate between precision, accuracy and reliability. ▪ Differentiate between a standard and a control. ▪ Define and describe the significance of the following terms: o mean, median and mode o standard deviation, variance ▪ Compute the mean, median and mode for a given set of data. ▪ Identify the percentage of observations encompassed by the mean + 1, +2, +3 standard deviations. ▪ Define the use of a Levy-Jennings chart. ▪ Generate a Levy-Jennings graph for a given set of date. ▪ Describe the procedure for establishing normal or reference values.
Student will list the types, components and uses of automation and computerization in the clinical laboratory	▪ Define terminology associated with Laboratory Information Systems. (LIS) ▪ Discuss the functions and various uses of the LIS. ▪ Give three example of information required or generated for each

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	area of LIS usage. ▪ Outline the selection of a Laboratory Information System (LIS) using needs analysis, system evaluation, request for proposal and cost justification. ▪ Restate the function and general components of analytic automation within the laboratory. ▪ List function and major methodologies incorporated in automated analyzer currently used within the laboratory.
Student will define function, list major tests performed and perform basic tests in each department of the Clinical Laboratory.	▪ Identify all departments in the clinical laboratory. ▪ Describe the function of each clinical department. ▪ List and paraphrase the significance of the general tests performed in the each clinical department.
Student will define the purpose and skills required and list all safety procedures observed in the practices of phlebotomy.	▪ Define phlebotomy and describe phlebotomy services. ▪ Explain the role and responsibilities of the phlebotomist. ▪ List the professional competencies for phlebotomists. ▪ List the skills necessary for effective communications. ▪ Describe basic principles of quality and give examples of quality assessments for phlebotomy. ▪ Paraphrase the importance of safety in phlebotomy and list all areas of phlebotomy where safety is used. ▪ Apply the OSHA Blood-borne Pathogens standard to use in phlebotomy. ▪ Describe safety equipment and practices used in phlebotomy. ▪ Identify risk associated with phlebotomy and patient testing. ▪ Explain risk management as it applies to phlebotomy procedures.
Student will describe the components Cardiovascular system and blood as it relates to the practice of phlebotomy.	▪ Describe the basic function of the cardiovascular system. ▪ Distinguish the characteristics of arterial, venous and capillary blood and vessels.

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	▪ Name and locate the veins most commonly used for phlebotomy. ▪ List the components of blood. ▪ Identify the functions of blood cells and platelets. ▪ Explain the difference between serum and plasma.
Student will describe the practice, importance and demonstrate proper performance of phlebotomy specimen documentation, handling and transportation.	▪ Describe the importance of proper patient identification. ▪ List methods of proper patient identification. ▪ Describe the essential elements in completing a requisitions form. ▪ Interpret a specimen requirement as written in standard operating procedure format. ▪ Describe the requirements of specimen collection as it relates to timed and fasting specimens. ▪ List and explain the impact of improper specimen collection. ▪ Describe proper specimen labeling procedures. ▪ Interpret computer generated labels. ▪ List the basic specimen handling guidelines for maintaining specimen integrity. ▪ Describe which blood constituents are photosensitive or thermolabile. ▪ Name three methods commonly used to transport specimens. ▪ List reason for specimen rejection.
Student will identify, describe function and properly use basic blood collection equipment.	▪ Describe the latest phlebotomy safety supplies and equipment and state the use of each. ▪ Identify the various supplies that should be carried on a specimen collection tray when a skin puncture specimen must be collected. ▪ Identify the types of venipuncture tubes and define the purpose and use of the additives/anticoagulants. ▪ Describe the difference between the venipuncture and skin puncture equipment.

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Student will describe and properly perform basic venipunture procedures.	▪ Describe the patient identification process. ▪ Describe hand hygiene and gloving procedures before and after venipuncture. ▪ Identify the most appropriate sites for venipuncture. ▪ Describe how to apply a tourniquet and explain its effects on the venipuncture process. ▪ Describe the decontamination process fro a venipuncture and blood culture collection. ▪ Describe the detailed steps of a venipuncture procedure. ▪ Identify the order of draw for venipuncture tubes. ▪ Explain phlebotomy procedure when using a syringe. ▪ Explain the proper procedure for venipuncture when: ▪ Using a winged infusion set ▪ Using a syringe ▪ Collection of blood cultures ▪ Collection of Arterial Blood Gases ▪ Describe the importance of timed, fasting and STAT specimens. ▪ Explain proper patient care during the entire phlebotomy process. ▪ Identify the types of difficult draws and explain proper procedure for these situations.
Student will describe and properly perform capillary blood collection technique.	▪ Define the purpose and proper collection technique of a capillary blood draw. ▪ Identify the proper sites for performing a skin puncture procedure. ▪ Identify equipment and its use for capillary collection. ▪ Explain why controlling the depth of the incision is necessary. ▪ List situations where capillary collection is performed. ▪ Describe the procedure for making a blood smear.

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Student will describe and list function of trouble shooting, problem solving skills and continuing education in professional development as it relates to phlebotomy.	▪ Discuss pre analytical, analytical. and post analytical considerations. ▪ In group format, read and analyze case studies related to phlebotomy and discuss the case study topic and the impact on laboratory testing and/or interpretation. ▪ Read and summarize major points of a current journal article that relates to phlebotomy. ▪ Identify the impact of new developments on this area of the laboratory or on patient care.