

J. Sargeant Reynolds Community College
Course Content Summary

Course Prefix and Number: MDL 261

Credits: 4

Course Title: Clinical Chemistry and Instrumentation I

Course Description: Introduces methods of performing biochemical analysis of clinical specimens. Teaches instrumentation involved in a clinical chemistry laboratory, quality control, and the ability to recognize technical problems. Part I of II. Prerequisites or Co-requisites: MDL 100 and CHM 101 or CHM 111. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

General Course Purpose: Provides theory and techniques required to perform chemistry and immunochemistry testing in an automated laboratory. Theory includes background on test methods, application, automation, and the clinical significance of the results as they relate to disease states. Major organ systems and related tests are studied. This course focuses on quality control--what it is and how it is used in the laboratory. Significant laboratory time is allotted to working in a clinical chemistry lab, including maintenance and troubleshooting.

Course Prerequisites and Co-requisites:

Prerequisites or Co-requisites: MDL 100 and CHM 101 or CHM 111

Student Learning Outcomes:

Upon completing the course, the student will be able to

- a. Apply safety rules;
- b. Demonstrate working knowledge of QA, QC, QI;
- c. Demonstrate specimen collection, processing, and analysis of designated analytes;
- d. Describe the principle, procedure, reagents, precautions, and sources of error for select analytes;
- e. Describe "Reference Range" and its use in decision making and resulting for select analytes;
- f. Correlate normal and abnormal physiology, clinical significance, and laboratory testing for the following analytes: carbohydrates, lipids, non-protein nitrogenous compounds, proteins, enzymes, electrolytes, blood gasses/ pH, cardiac markers, and therapeutic drug monitoring/toxicology;
- g. Describe/identify clinical chemistry theory related to the following: instrumentation, automation, and related laboratory operations; and
- h. Define/Describe the principles of instrumentation, to include: spectrophotometry, fluorometry, nephelometry, sensors, chromatography, electrophoresis, flow cytometry, and Point-of-Care.

Major Topics to Be Included:

- a. Human pathophysiology as relates to the Clinical Chemistry laboratory.
- b. Correlate 'normal' vrs 'abnormal' vrs. 'critical' values and the appropriate action for each.
- c. Quality assessment/laboratory procedures
- d. Laboratory techniques (manual and automated) and instrumentation utilized.

Date Created/Updated (Month, Day, and Year): November 22, 2019