

Virginia Western Community College

MDL 262

Clinical Chemistry and Instrumentation II

Prerequisites

MDL 261 or equivalent

VWCC Course Description

This course provides a comprehensive introduction to the fundamental principles of clinical chemistry. Students will explore laboratory automation, clinical chemistry methodologies, and point-of-care testing. Key topics include gastrointestinal, cardiac, and liver function analysis.

The curriculum emphasizes the evaluation of organ system functions, covering endocrine regulation, calcium homeostasis, hepatic and cardiovascular functions, renal diagnostic tests, and pancreatic assessment. Additional areas of focus include therapeutic drug monitoring, clinical toxicology, and nutritional evaluation. Special considerations for pediatric and geriatric patient populations are integrated throughout the course to ensure a holistic understanding of clinical applications.

Semester Credits: 4

Lecture Hours: 3

Laboratory Hours: 3

Required Materials

Textbook

Clinical Laboratory Chemistry 2nd Edition by R. L. Sunheimer and L. Graves
Pearson ISBN: 978-0134413327

Other Required Materials:

[Add Other Required Materials Here]

VWCC COURSE OUTCOMES

- Describe the structure and functions of the various organ systems of the human body along with disease states that can affect each system discussed.

- Describe the biochemistry of the gastrointestinal, pancreas, cardiac, and liver systems to include structure, function, and pathology of diseases.
- Identify normal ranges laboratory testing and correlate the conditions associated with elevated or decreased values.
- Identify the analytes that can be used as markers of disease states, such as cardiac and liver enzymes.
- Identify the drugs commonly assayed in therapeutic drug monitoring (TDM) and their clinical usage, and how to measure drug metabolites in the clinical laboratory.
- Identify toxic substances that are commonly identified in the clinical setting such as illicit drugs and heavy metals and understand how they are harmful to exposed humans.
- Describe various disease states caused by nutritional factors, including diabetes, and assay for specific nutrients critical for normal homeostasis.
- Recognize how pre-analytical, post-analytical and especially analytical errors can affect test results.
- Understand instrument methodology and types of instrumentation to measure the discussed analytes.

VWCC TOPICAL DESCRIPTIONS

- Mineral and Bone Metabolism
- The Endocrine system
- Gastrointestinal Function
- Pancreas
- Cardiac Function
- Liver Function
- Iron, Porphyrins, and Hemoglobin
- Therapeutic Drug Monitoring
- Toxic Substance
- Nutrition and Vitamins
- Tumor Markers
- Geriatric Clinical Chemistry
- Pediatrics

[TITLE IX STATEMENT](#)

[ADA STATEMENT](#)