RARITAN VALLEY COMMUNITY COLLEGE
ACADEMIC COURSE OUTLINE

MLTC 294 Clinical Experience: Chemistry & Immunology

I. Basic Course Information

A. Course Number and Title: MLTC 294 Clinical Experience: Chemistry & Immunology

B. New or Modified Course: Modified

C. Date of Proposal: Semester: Fall Year: 2024

D. Effective Term: Fall 2025

E. Sponsoring Department: Science & Engineering

F. Semester Credit Hours: 2

G. Weekly Contact Hours: Clinical: 96 hours total
Out of class student work per week: 0

H. Prerequisites/Corequisites: MLTC 210 and MLTC 130 with a grade C or higher or with instructor's permission

I. Laboratory Fees: None

II. Catalog Description

Prerequisite – MLTC 210 and MLTC 130 with a grade C or higher or with instructor's permission
This course provides entry-level clinical laboratory experience in the areas of Chemistry and Immunology. Emphasis is placed on technique, accuracy, and precision. Upon completion, students should be able to demonstrate entry-level competence on final clinical evaluations.

III. Statement of Course Need

A. Clinical chemistry testing and analysis are necessary skills needed for competent MLTs. This course is required for the Medical Laboratory Technology program.

B. This course is completed at the clinical site.

C. This course generally transfers as a Free Elective, but dependent on the transfer institution, it may transfer as a Program Elective to schools that offer a B.S. degree in Clinical Laboratory Science.

IV. Place of Course in College Curriculum

A. Free Elective
B. This course meets a program requirement for the Associate of Applied Science degree program in Medical Laboratory Technology
C. To see course transferability: a) for New Jersey schools, go to the NJ Transfer website, www.njtransfer.org; b) for all other colleges and universities, go to the individual websites.

V. Outline of Course Content

I. GENERAL CHEMISTRY
A. Carbohydrates
1.Test procedures
a. Principles
b. Special precautions, specimen collection and processing, troubleshooting, and interfering substances
c. Tolerance testing
d. Glycated proteins
2. Test result interpretation
3. Disease state correlation
B. Lipids
1. Test procedures
a. Principles
b. Special precautions, specimen collection and processing, troubleshooting, and interfering substances
2. Test result interpretation
3. Disease state correlation
C. Heme Derivatives
1. Test procedures
a. Principles
b. Special precautions, specimen collection and processing, troubleshooting, and interfering substances
2. Test result interpretation
3. Disease state correlation
II. PROTEINS AND ENZYMES
A. Enzymes
1. Test procedures
a. Principles
b. Special precautions, specimen collection and processing, troubleshooting, and interfering substances

2. Test result interpretation
3. Disease state correlation

B. Proteins and Other Nitrogen-Containing Compounds

1. Test procedures

a. Principles

b. Special precautions, specimen collection and processing, troubleshooting, and interfering substances

c. Clearances

2. Test result interpretation
3. Disease state correlation

III. ACID-BASE, BLOOD GASES AND ELECTROLYTES

A. Acid Base & Blood Gases

1. Test procedures

a. Analytical principles

b. Special precautions, specimen collection and processing, troubleshooting, and interfering substances

2. Test result interpretation
3. Disease state correlation

B. Electrolytes

1. Test procedures

a. Principles

b. Special precautions, specimen collection and processing, troubleshooting, and interfering substances

2. Calculations (osmolality, anion gap)
3. Test result interpretation
4. Disease state correlation

IV. SPECIAL CHEMISTRY

A. Endocrinology

1. Test procedures

a. Principles

1) Fluorescence
2) Immunoassay
3) Other methods

b. Special precautions, specimen collection and processing, troubleshooting, and interfering substances

c. Stimulation/suppression tests

2. Test result interpretation
3. Disease state correlation

B. Vitamins and Nutrition

1. Test procedures

a. Principles

b. Special precautions, specimen collection and processing, troubleshooting, and interfering substances

2. Test result interpretation
3. Disease state correlation

C. Therapeutic Drug Monitoring

1. Test procedures
    a. Principles
        1) Immunoassay
        2) Other methods
    b. Special precautions, specimen collection and processing, troubleshooting, and interfering substances
2. Test result interpretation
3. Disease state correlation

D. Toxicology
1. Test procedures
    a. Principles
        1) Immunoassay
        2) Other methods
    b. Special precautions, specimen collection and processing, troubleshooting, and interfering substances
2. Test result interpretation
3. Disease state correlation

Immunology

1. Procedures in Immunology including,
    a. RPR
    b. VDRL
    c. C-reactive protein
    d. RA screen and titer
    e. ASO-titer
    f. Monospot or Monotest
    g. Cold agglutinin
    h. Lyme test
    i. Pregnancy test
    j L.E. Screen
    k Rubella titer
2. Interpretation of lab procedures listed in # 1.
3. CH50 assay and result interpretation
6. Principles for the following immunologic tests:
    a. precipitation
    b. agglutination
    c. complement fixation
    d. neutralization
    e. fluorescent techniques
    f. immunoassays
    g. nephelometry
    h. PCR

7. Hepatitis markers for serologic detection and identification techniques of the following
    a. HAV
    b. HBV

c. HCV
d. HDV
e. HEV

13. HIV antibody test and interpretation of the results by following techniques,
    a. ELISA
    b. Western Blot
    c. IFA
    d. Slide agglutination
    e. RIA
    f. Rapid test (i.e. Ora Quick saliva testing)
14. Laboratory diagnosis of SLE
15. Clinical applications of ANA staining patterns

VI. A. Course Learning Outcomes:

At the completion of this course, the student will be able to:

1. Explain the principles and significance of chemistry and immunology tests and results (GE-1).
2. Use appropriate mathematical applications to interpret data (GE-2*).
3. Explain the principles of and demonstrate correct use of chemistry and immunology instrumentation and technology (GE-1, 3, 4).

(*Embedded critical thinking)

4. Perform the appropriate manual and automated analyses in clinical chemistry and immunology lab with accuracy and precision
5. Evaluate and apply quality control measurements in all phases of analysis in the clinical chemistry and immunology lab.
6. Handle specimens for assay procedures following standard precautions and safety.
7. Identify the abnormal patient results and correlate those results with the patient's condition, and accurately report them.
8. Develop professionalism, communication skills, and interpersonal relationships by working cooperatively with instructors, preceptors and fellow students

A. Assessment Instruments

Students in this course are evaluated by the following methods.

1- Observation by clinical site instructors
2- Weekly Journal
3- Presentation

VII. Grade Determinants

1- Observation by Clinical Instructors

2- Weekly Journal

Students are expected to maintain a weekly journal and are graded based on completion.

3- Presentation

Students are graded based on the rubric provided to them.

VIII. Texts and Materials

Students must maintain the weekly lab journal during their clinical rotation.

Sunheimer, R. L., & Graves, L. (2018). *Clinical laboratory chemistry*. NY, NY: Pearson.
ISBN13: 9780134413327
ISBN10: 0134413326

Immunology & Serology in Laboratory Medicine
7th Edition
Author: Mary Turgeon
Paperback ISBN: 9780323711937
eBook ISBN: 9780323779326
eBook ISBN: 9780323779357
Imprint: Mosby
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LINNE & RINGSRUD'S CLINICAL LABORATORY SCIENCE, 8TH EDITION
BY MARY LOUISE TURGEON, EDD, MLS(ASCP)CM
ISBN13: 9780323530828
ISBN10: 0323530826

The course outline is intended only as a guide to course content and resources. Do not purchase textbooks based on this outline. The RVCC Bookstore is the sole resource for the most up-to-date information about textbooks.

IX. Resources

A. Clinical site laboratory

B. RVCC library database

X. Honors Options

An Honors Option is not available for this course.