MELT 1640: Hematology

A. COURSE DESCRIPTION

Credits: 5
Lecture Hours/Week: 3
Lab Hours/Week: 4
OJT Hours/Week: *
Prerequisites: None
Corequisites: None
MnTC Goals: None

This course’s focus includes blood cells and hemostasis. Time is spent understanding the function of each cell and techniques used to enumerate blood cells. Students practice making and staining blood smears, along with evaluation and differentiation of the blood cells microscopically. Diseases and conditions that would result in abnormalities in laboratory results are also discussed. The anemias and stem cell disorders are studied in detail, including pathophysiology and laboratory diagnosis. The course also includes a study of the blood coagulation process, both theory and practical application. Operations of hematology and coagulation analyzers with interpretation of results are practiced.

B. COURSE EFFECTIVE DATES: 04/05/2024 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Focus the microscope according to protocol.
2. Draw the hemoglobin molecule and explain function.
3. Perform hemoglobin, hematocrit, erythrocyte sedimentation rate (ESR); correlate results with disease states.
4. Calculate red blood cell (RBC) indices.
5. Recognize each stage of maturation for RBC, white blood cell (WBC), and platelet.
6. Prepare, stain, and evaluate peripheral blood smears.
7. Calculate reticulocyte counts, leukocyte alkaline phosphatase (LAP) scores, & corrected WBC.
8. Discuss pathophysiology of anemias and stem cell disorders.
9. Differentiate types of anemias given lab reports and images.
10. Differentiate types of stem cell disorders given lab reports and images.
11. Diagram and explain the coagulation process.
12. Perform hemostasis testing.
13. Operate automated hematology and coagulation instruments.
14. Evaluate coagulation studies to determine causes of bleeding and thrombosis.
15. Interpret blood histograms and scatterplots.
D. LEARNING OUTCOMES (General)

1. Exhibit basic functional and microscopic knowledge of RBCs, related testing, and associated disease states.
2. Gain understanding of the purpose and performance of total WBCs.
3. Recognize stages of WBC and platelet maturation; prepare smears; and perform acceptable estimates and differentials, correlating results with disease states.
4. Synthesize and evaluate laboratory results to determine the cause of anemia.
5. Demonstrate knowledge of the various stem cell disorders.
6. Operate an automated hematology instrument and interpret the data.
7. Perform hemostasis testing.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted