

Common Course Outline
BIOL 145
Medical Laboratory Techniques I: Hematology, Coagulation
4 Credits

The Community College of Baltimore County

Description

Medical Laboratory Techniques: Hematology, Coagulation

Provides preparation for clinical internships (MLTC 240, 241) in Hematology and Coagulation laboratories; includes formation and function of blood cells in health and in disease, hemostatic mechanisms of the body, and phlebotomy.

4 credit hours: 2 lecture hours and 3 laboratory hours per week.

Prerequisite: BIOL 110, CHEM 107, 108, MATH 135, MLTC 101, Hepatitis B vaccination and health insurance. (Offered Spring, day only)

Overall Course Objectives

Upon completion of this course, students will be able to:

1. describe the formation of WBC, RBC and platelet cell lines.
2. explain in detail the functions of all three cell lines.
3. list at least 3 stains used in Hematology and give names and functions of each component of each stain.
4. list changes that occur as normal blood cells mature.
5. describe the structure and function of the hemoglobin molecule.
6. identify various red cell inclusions and abnormal morphologic changes and relate the abnormalities to disease processes.
7. perform manual counts of red cells, white cells, and platelets, and calculate red cell indices.
8. compare and contrast the Coulter electronic cell counting principle and the light scatter cell counting principles as used in automated hematology instruments.
9. categorize various anemias based on morphologic characteristics.
10. identify WBC abnormalities, including acute and chronic leukemias, and relate abnormalities to disease processes.
11. describe in detail the function of the hemostatic system as found in the human body.
12. explain the procedure and usefulness of results of routine coagulation tests such as PT, APTT, TT, fibrinogen, FDP.

13. explain quality control procedures used in a routine Hematology/Coagulation laboratory, especially relating to instrument trouble-shooting.
14. perform a routine venipuncture by practicing with a simulated patient arm and classmate arms.
15. present two journal article reviews both orally and in written form.
16. perform selected laboratory tests as used in clinical laboratories and relate test results to clinical condition of patient. Also identify possible sources of error in the test system.
17. participation in a tour of a clinical Hematology/Coagulation laboratory to examine actual equipment in use, observe work flow, and question working technicians and technologists.
18. demonstrate internalization of laboratory safety procedures:
 - ❖ always wear appropriate personal protection equipment
 - ❖ dispose properly of sharps, contaminated glassware, gloves, etc.
 - ❖ behave correctly in a laboratory setting, e.g. no horseplay, shoving, eating, drinking.
19. by mastering the content of the course, begin to appreciate the role a laboratory technician plays in the diagnosis and treatment of disease.
20. demonstrate problem-solving skills in laboratory exercises and case history problems.
21. demonstrate inter-personal skill by cooperation with other members of the student laboratory group.
22. demonstrate the ability to read a procedure, plan a course of action, and follow through to a conclusion.

Major Topics

Hematopoiesis
Erythrocyte Production and Destruction
Hemoglobin and Iron Metabolism
Anemias
Hemoglobinopathies
Thalassemias
Leukopoiesis
Benign Leukocyte Disorders
Cytochemistry and Special Stains
Myeloproliferative Disorders
Myelodysplastic Syndromes
Acute and Chronic Leukemias
Thrombopoiesis
Hemostasis
Coagulation Disorders
Platelet Abnormalities

Course Requirements

Students will be expected to submit
1 Written Journal Article Review
10 Laboratory Exercises

There will be 3 unit examinations, competency assessments and a comprehensive final examination.

Other Course Information

Prior to beginning student labs, students will present proof of current health insurance, and a Hepatitis B vaccine certificate or waiver.