



Course Number and Title: MLT 120 Hematology I

Campus Location:

Georgetown

Effective Date:

2019-51

Prerequisite:

ENG 090 or ENG 091, MAT 020, SSC 100 or concurrent

Co-Requisites:

None

Course Credits and Hours:

4.00 credits

3.00 lecture hours/week

3.00 lab hours/week

Course Description:

This course covers normal maturation, morphology, function of blood cells, and hemostasis as well as qualitative and quantitative changes that occur. Topics include phlebotomy techniques and the practical application of instrumentation used in the hematology lab.

Required Text(s):

Obtain current textbook information by viewing the [campus bookstore - https://www.dtcc.edu/bookstores](https://www.dtcc.edu/bookstores) online or visit a campus bookstore. Check your course schedule for the course number and section.

Additional Materials:

Lab Coat

Schedule Type:

Classroom Course

Disclaimer:

Students are required to have proof of immunization with Hepatitis B vaccination prior to laboratory class.

Core Course Performance Objectives (CCPOs):

1. Describe the maturation and morphology of various diseases and conditions, and explain how laboratory tests correlate for each of the blood cell lines. (CCC 1, 2, 5; PGC 6)
2. Collect, identify, and describe the types of specimens and/or samples used in hematology, and identify the variables that can adversely affect laboratory results. (CCC 1, 2, 3, 4, 5; PGC 1, 2, 5, 7)
3. Perform testing of specimens using a variety of methods to include both manual and automated methods. (CCC 2, 3, 6; PGC 1, 2, 3, 4)
4. Evaluate laboratory data using statistical systems for quality control after evaluating statistical data. (CCC 1, 2, 6; PGC 1, 2, 3, 4)
5. Describe safety awareness for the hematology laboratory personnel to include bloodborne pathogens and the use of personal protective equipment for the laboratorian and for instrumentation. (CCC 4, 5; PGC 4, 5)
6. Describe the healthcare system's organizational structure. (CCC 1, 3, 4, 5; PGC 4, 5, 7)
7. Describe the legal and ethical importance of the medical laboratory technician's role in the healthcare system. (CCC 1, 3, 4, 5; PGC 4, 5, 7)

See Core Curriculum Competencies and Program Graduate Competencies at the end of the syllabus. CCPOs are linked to every competency they develop.

Measurable Performance Objectives (MPOs):

Upon completion of this course, the student will:

1. Describe the maturation and morphology of various diseases and conditions, and explain how laboratory test correlate for each of the blood cell lines.
 1. Describe the chemical composition and general function of cellular components.
 2. Explain the origin of blood cells, and trace the sequential sites of cellular proliferation and development.
 3. Describe the development of cells from the stem cell to the mature cell.
 4. Name the cells that will mature into erythrocytes, thrombocytes, plasma cells, and the five leukocyte types in developmental order.
 5. Describe the major morphological characteristics of normal and defective hematopoiesis.
 6. Describe the nuclear and cytoplasmic characteristics of the leukocytes, erythrocytes, and platelets in normal and abnormal conditions.
 7. Describe the physiological role of hemoglobin and disease conditions that can occur.
 8. Define normal and abnormal laboratory values for hematological data and disease states that could alter laboratory values.

9. Perform a differential smear accurately and correctly.
 10. Properly identify hematological cells.
 11. Properly stain a blood smear.
 12. Perform hematology laboratory tests.
 13. Describe the principle characteristics of a hematological condition, and relate the abnormal conditions pertinent to it.
2. Collect, identify, and describe the types of specimens and/or samples used in hematology, and identify the variables that can adversely affect laboratory results.
 1. Explain the different specimens used in the clinical laboratory (serum, plasma, whole blood, and bone marrow samples), and identify the testing that is performed.
 2. Describe how specimen integrity can affect hematological laboratory results.
 3. Describe the importance of using excellent interpersonal skills while collecting a blood specimen from a patient.
 4. Describe the equipment used for blood collection.
 5. Name and explain the types of specimens used for laboratory testing.
 6. Name and explain the types of anticoagulants used for specimen collection.
 7. Describe the purpose and use of Unopettes.
 8. Use a Unopette for hemacytometry correctly.
 9. Perform a venipuncture successfully ten times.
 10. Identify the proper use of sample collection devices used in the laboratory.
 11. Prepare a blood smear for cell identification.
 3. Perform testing of specimens using a variety of methods to include both manual and automated methods.
 1. Describe the general principles of basic procedures in hematology.
 2. Prepare the necessary reagents or instrumentation for the stated procedures: white blood cell, red blood cell, hemoglobin, hematocrit, and platelet count.
 3. Describe the methodology of procedures, sources of error, and clinical applications for various procedures.
 4. State the normal values for the parameters measured in various procedures.
 5. Perform hemacytometer cell counting.
 6. Perform hematologic counting using automated methods.
 7. Perform white blood cell differential count.
 8. Perform a hematocrit.
 9. Perform a hemoglobin analysis.
 10. Perform any calculations needed for reporting the results of a procedure.
 4. Evaluate laboratory data using statistical systems for quality control after evaluating statistical data.
 1. List and explain essential analytical and non-analytical factors in quality control.
 2. Name the functions of a quality control program.
 3. Describe statistical terms and the use of quality control charts.
 4. Explain the types of changes that can be observed in quality control charts.
 5. Perform quality control for the hematology lab doing manual procedures.
 6. Perform quality control for automated hematology.
 7. Analyze data to determine if testing data is acceptable.
 5. Describe safety awareness for the hematology laboratory personnel to include bloodborne pathogens and the use of personal protective equipment for the laboratorian and for instrumentation.
 1. Explain the basic techniques in the prevention of disease transmission.
 2. Name the components of the personal protective equipment standard.
 3. Describe essential safety practices to be used in the hematology lab.
 4. Explain the purpose and contents of a laboratory safety manual.
 5. Demonstrate proper use of personal protective equipment in the hematology laboratory.
 6. Demonstrate proper use of standard precautions in the hematology laboratory.
 6. Describe the healthcare system's organizational structure.
 1. Identify the healthcare providers in hospitals and clinics.
 2. Describe the various hospital departments, their major functions, and the role of the medical lab technician (MLT) as a part of the healthcare team.
 3. Develop a chart of the organizational structure of the hospital laboratory.
 4. Properly identify and explain in the presence of the patient verification of the patient's name, date of birth (DOB), unique hospital identification, and location in relation to the venipuncture procedure.
 7. Describe the legal and ethical importance of the medical laboratory technician's role in the healthcare system.
 1. Describe the legal and ethical importance of proper patient/sample identification.

Evaluation Criteria/Policies:

Students must demonstrate proficiency on all CCPOs at a minimal 75 percent level to successfully complete the course. The grade will be determined using the Delaware Tech grading system:

92	-	100	=	A
83	-	91	=	B
75	-	82	=	C
0	-	74	=	F

Students should refer to the [Student Handbook - https://www.dtcc.edu/handbook](https://www.dtcc.edu/handbook) for information on the Academic Standing Policy, the Academic Integrity Policy, Student Rights and Responsibilities, and other policies relevant to their academic progress.

Final Course Grade:

Calculated using the following weighted average

Evaluation Measure	Percentage of final grade
Unit exams	55%
Case Studies	10%
Laboratory exercises and Final Practical	35%
TOTAL	100%

Core Curriculum Competencies (CCCs are the competencies every graduate will develop):

1. Apply clear and effective communication skills.
2. Use critical thinking to solve problems.
3. Collaborate to achieve a common goal.
4. Demonstrate professional and ethical conduct.
5. Use information literacy for effective vocational and/or academic research.
6. Apply quantitative reasoning and/or scientific inquiry to solve practical problems.

Program Graduate Competencies (PGCs are the competencies every graduate will develop specific to his or her major):

1. Collect, process, and analyze biological specimens and other related substances.
2. Recognize factors that affect procedures and results, and take appropriate actions within predetermined limits when corrections are indicated.
3. Perform and monitor quality control within predetermined limits.
4. Apply basic scientific principles for application in medical laboratory procedures and methodologies.
5. Employ safety principles according to health and environmental regulations.
6. Correlate laboratory results with common disease processes and treatments for diagnosis.
7. Demonstrate professional conduct and interpersonal communication skills with patients, laboratory personnel, other healthcare personnel, and the public.

Disabilities Support Statement:

The College is committed to providing reasonable accommodations for students with disabilities. Students are encouraged to schedule an appointment with the campus Disabilities Support Counselor to request an accommodation needed due to a disability. A listing of campus Disabilities Support Counselors and contact information can be found at the [disabilities services - https://www.dtcc.edu/disabilitysupport](https://www.dtcc.edu/disabilitysupport) web page or visit the campus Advising Center.