

**McLennan**  
C O M M U N I T Y  
**C O L L E G E**

WACO, TEXAS

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**COURSE SYLLABUS**

**AND**

**INSTRUCTOR PLAN**

**Hematology**

**MLAB 1415.01**

**Alisa J. Petree, MHSM, MLS (ASCP)<sup>cm</sup>**

**NOTE: This is a 16-week course.**

**COVID 19 Notice:**

McLennan Community College is committed to providing you with every resource you need to reach your academic goals including your safety. We will continue to monitor the evolving situation with COVID 19 and adjust our safety guidelines to make sure we offer a safe environment for you and our faculty. Please make sure to consult your faculty and the MCC website on any changes to these guidelines.

Hematology  
MLAB 1415.01

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**Course Description:**

MLAB 1415 is an introduction to the theory and practical application of routine and special hematology procedures, both manual and automated; red blood cell and white blood cell maturation sequences, and normal and abnormal morphology and associated diseases. Utilizes a student laboratory for experiences in basic hematology procedures for face to face students, for online students a synchronous laboratory clinical rotation is required.

Hematology is a course that describes the structure and function of red and white blood cells, hematopoiesis, and the evaluation of stained blood smears. The area of study also includes the pathogenesis of various types of anemia and white blood cell disorders. An overview of instrumentation, cytogenetics, molecular techniques and special stains will also be included in the course. A student laboratory or hospital based experience is used for experiences relating to hematology laboratory techniques.

**Prerequisites and/or Corequisites:**

Prerequisite: Admission to the medical laboratory technician program and approval by the program director. Semester hours 4 (lec/lab).

- Have your textbook by the first class period. The hematology atlas is required.
- Plan on spending roughly 8-10 hours per week on course work for this class.
- It is highly recommended that students have access to a computer with reliable Internet access.
- McLennan Community College now provides students, faculty & staff the ability to sign up for and download Microsoft Office 365, for free!
- Use your MCC e-mail account to receive e-mails from your instructor and to communicate with the instructor.
- Most assignments are submitted using Brightspace.

Please note:

It is MCC's policy to assign all students, upon registration, an official e-mail address, which may remain in effect up to twelve months after students are no longer enrolled at MCC. MCC student e-mail addresses will be the only e-mail authorized to communicate official college information

or business. A student's failure to receive or read official communications sent to the student's assigned e-mail address in a timely manner does not absolve the student from knowing and complying with the content of the official communication.

Students must have access to a computer with reliable Internet access to participate in this class. Students should also download Adobe Reader to open any PDF files in the course (free download).

**Instructor Information:**

Instructor Name: Alisa J. Petree

MCC E-mail: [apetree@mclennan.edu](mailto:apetree@mclennan.edu)

Office Phone Number: 254-299-8406

Office Location: S320 (3rd floor of the science building)

Office/Teacher Conference Hours: Monday/Wednesday 9:30 AM – 11:30 AM,

Tuesday/Thursday 9:00 AM – 10:00 AM

Other times available by request.

Students are welcome to arrange a ZOOM meeting also. Please e-mail me to request a meeting.

**Required Text & Materials:**

Title: Rodak's Hematology Clinical Principles and Applications

Author: Keohane

Edition: 6<sup>th</sup> edition

Publisher: Elsevier

ISBN: 9780323530453

**Required atlas:**

Clinical Hematology Atlas 5th edition, Bernadette F. Rodak and Jacqueline H. Carr.

ISBN: 9780323322492

Title: Bloodborne & Airborne Pathogens (Wkbk)

Author: National Safety School

Edition: Copyright year: 2011

Publisher: National Safety Council

ISBN: 9780879123154

Supply List

1. MCC MLT scrubs with MCC embroidery/patch
2. Long white lab coat with MCC embroidery/patch
3. Closed-toe walking shoes and socks
4. Watch/timing device with a second hand
5. Sharpie or permanent marker
6. Black ink pen
7. Binder or notebook
8. Index cards (optional)

**MCC Bookstore Website:** <http://www.mclennan.edu/bookstore/>

**Methods of Teaching and Learning:**

MLAB 1415 is designed to prepare students to function at an entry-level position in a routine hematology laboratory. Lectures, case studies, demonstrations, prepared blood smears, laboratory exercises, clinical experiences, Internet exercises, quizzes, streaming video, recordings, and resource applications will be used during the course. Emphasis will be placed on the identification of normal, mature cells seen in the peripheral blood. Abnormal cells will be studied in relationship to the different diseases of the blood.

**Course Objectives and/or Competencies:**

The student will describe basic laboratory techniques used in the hematology section; identify principles and procedures of hematology tests to include sources of error and clinical significance of results; and evaluate normal and abnormal erythrocyte morphology and related diseases. The student will evaluate normal and abnormal leukocyte morphology and related diseases; and perform routine hematology tests to include a CBC and peripheral smear evaluation. The student will demonstrate an understanding of hematology; describe disease states associated with abnormal hematology results; and perform basic hematology testing by scoring a grade of 75 or better in the class.

After completion of MLAB 1415 Hematology the student should be able to meet the following general course objectives:

1. Collect, process, and analyze hematology specimens.

2. Recognize and apply principles related to the use of laboratory information systems used in the hematology.
3. Perform analytical tests on body fluids, cells, and other substances tested in the department.
4. Recognize factors that affect methods and test results and take appropriate actions within established guidelines using the skills of critical thinking and problem solving.
5. Recognize the clinical significance of laboratory procedures in the diagnosis and treatment of disease.
6. Perform and monitor routine departmental quality control within established guidelines by applying the principles of critical thinking and problem solving.
7. Perform preventive and corrective maintenance of equipment and instruments and refer to appropriate sources as necessary.
8. Utilize the principles of laboratory safety, including Standard Precautions. Practice all safety protocols prescribed by the college relating to COVID.
9. Demonstrate professional conduct and interpersonal communication skills with patients, laboratory personnel, other health care professionals, and with the public.
10. Recognize the responsibilities of other laboratory and health care personnel and interact appropriately with them for quality patient care.
11. Apply basic scientific principles in learning new techniques and procedures.
12. Relate laboratory test results to common disease processes by recognizing the principles and methodologies practiced in the department.
13. Establish and maintain continuing education as a function of growth and maintenance of personal and professional competence.

### **Rationale**

Medical laboratory technician students must demonstrate entry-level proficiency in the practice of Hematology testing as a fundamental part of the MLT training. This course is designed to aid

students academically, mentally and emotionally for the experiences they will encounter in the clinical or workplace setting.

### **Learning Outcomes**

Learning outcomes, or specific course objectives, for the cognitive, affective, and psychomotor domains are listed for each unit and will be available to students on the first day of class via Brightspace.

### **Course Outline or Schedule:**

Learning outcomes, or specific course objectives, for the cognitive, affective, and psychomotor domains are listed for each unit and will be available to students on the first day of class via Brightspace. The class schedule (calendar) will also be available the first day of class.

- I. Introduction to Hematology and Routine laboratory evaluation of blood cells
  - A. Safety in the hematology laboratory
  - B. Specimen collection to include venipuncture and capillary punctures
  - C. Blood smear preparation and staining of blood smears
  - D. Routine testing in hematology
  - E. Use the microscope and examination of the peripheral blood smear
  - F. Introduction to hematology instrumentation
- II. Hematopoiesis
  - A. Morphology and function of cellular components
  - B. Hematopoietic theory
  - C. Erythrocyte production and destruction
  - D. Metabolism of the erythrocyte
  - E. Bone marrow overview
  - F. Hemoglobin metabolism
  - G. Leukopoiesis
- III. Hematopathology: erythrocyte disorders
  - A. Anemias: RBC morphology and approach to diagnosis
  - B. Disorders of iron metabolism
  - C. Anemias caused by defects of DNA metabolism
  - D. Bone marrow failure

- E. Selected topics on hemolytic anemias
- IV. Malignant and Nonmalignant alterations of leukocytes
  - A. Qualitative alterations of leukocytes
  - B. Quantitative alterations of leukocytes
  - C. Introduction to leukocyte neoplasms
  - D. Acute leukemias
  - E. Chronic leukemias
- VI. Supplemental information – incorporated into topics I-IV
  - A. Flow cytometric analysis in diagnostic hematology
  - B. Cytochemistry
  - C. Immunocytochemistry
  - D. Cytogenetics and Molecular diagnostics in the clinical laboratory

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All assignments must be submitted via Brightspace unless otherwise instructed.

Learning Unit & Dates		Reading	Assignments/Labs	Exams
1	8/23-8/29	Chapter 1 Chapters 3,4 Cell structure and Hematopoiesis	Venipuncture demonstration Capillary puncture demonstration  MTS Biosafety LU 1 Quiz - Microhematocrit	
2	8/29-9/5	Chapter 5 RBC production and destruction  Chapter 6 RBC metabolism and membrane structure	Hematocrit (manual)-lab LU 2 Blood Smear Preparation and Staining – Quiz format	

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3	9/5-9/12	Chapters 7 Hemoglobin metabolism	Hemoglobin assay(s) XP 300 and Pointe 180 - lab	
4	9/12-9/19	Chapter 8 Iron kinetics and laboratory assessment	RBC – reticulocyte counts – lab LU 4 ASCP Blood Cell ID Quiz	Exam 1 Chapters 1,3,4,5,6,7 Wednesday
5	9/19-9/26	Chapter 2 Quality assurance and Quality control Chapter 9 WBC development, kinetics and functions	Differential counts - lab Sedimentation Rates -lab WBC foldable maturation sequence(s) – created project	
6	9/26-10/3	Chapter 10 Platelet production, structure and function	Platelet estimates-lab	
7	10/3-10/10	Chapters 16-17 Anemias and disorders or iron kinetics and heme metabolism	RBC Indices - and Peripheral smears LU 7 Iron Kinetics - worksheet LU 7 Hematology Math - worksheet	
8	10/10-10/17	Chapters 18-20 Anemias caused by defects of DNA metabolism Bone marrow failure Introduction to increased destruction of RBCs	RBC and WBC Morphology review of smears - lab  RBC Brochures – created project LU 8 Heinz Bodies	Exam 2 Chapters 8,2,9,10, 16-17 Wednesday



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9	10/17-10/24	Chapters 21-23 Intrinsic defects of rbcs Extrinsic defects of rbcs Non-immune and immune	LU 9 HDFN Lab Medicine Quiz LU 9 Malaria Quiz	
10	10/24-10/31	Chapters 24-25 Hemoglobinopathies and thalassemias	Mini-PCR Sickle Cell gene detection- lab	
11	10/31-11/7	Chapters 26-27 Nonmalignant leukocyte disorders Introduction to neoplasms		Exam 3 Chapters 18,19,20,21,22,23,24,25 Wednesday
12	11/7-11/14	Chapters 28-31 Selected topics Flow cytometry Molecular techniques Cytogenetics Acute Leukemias	LU 12 Acute Leukemia Comparison	
13	11/14-11/21	Chapter 32 Myeloproliferative neoplasms Chapter 33 Myelodysplastic syndromes Chapter 34 Mature lymphoid neoplasms	LU 13 Myeloproliferative Assignment	
14	11/21-11/28	Thanksgiving Week – Class on Monday only		Exam 4- Chapters 26-34 Wednesday

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15	11/29-12/5	Review for final exam Practical Exam		Exam 5 Practical Exam - Wednesday
16	Final Exam			

**Subject to Change Disclaimer:**

The policies, regulations, procedures, and fees associated with this program are subject to change without prior notice, if necessary, to keep College and program policies in compliance with State and Federal laws and/or with rules related to the program's accrediting agency. The College and the program reserve the right to change curricula, rules, fees, and other requirements, of whatever kind, affecting students in any way. The provisions of this document do not constitute a contract, express or implied, between any applicant, student, faculty or staff member and McLennan Community College or this program.

Students should regularly check their student email and the announcements on Brightspace for changes in the class schedule.

**Course Grading Information:**

Grading Policy

Grade	Percentage Points
A	90-100%
B	80-89%
C	75-79%
D	70-74%
F	69% and below

I round final grades. For example, if you achieve a final score of 79.5%, you will receive a B in the course. If you achieve a 79.4%, you will receive a C.

Any student earning a grade of less than 75% on an assignment/exam is required to

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schedule a conference time with the Program Director. The conference will be to identify potential solutions aimed at student success.

	<b>Breakdown</b>
Assignments/Labs	40%
Examinations	45%
Final Exam	15%
<b>Total Course Points</b>	<b>100%</b>

Grades will be posted on Brightspace.

Assignments

Your assignment grade may include work such as quizzes, projects, worksheets, and/or homework. All assignments must be turned in Sunday by 11:30 PM or the student will receive a zero for the assignment.

Lab Exercises

Being competent in the laboratory is critical for the MLT. Therefore, it is crucial that each student be present and able to complete his/her lab assignments. Practical lab exams may be given to determine competency. Many lab exercises/assignments may not be available to makeup. All labs must be turned in Sunday by midnight or the student will receive a zero for the lab.

Examinations

There are **five** major examinations which may be comprehensive. No make-up exams are given. If you miss an exam, due to an excused absence, the grade you make on the final exam will be the grade also for the missed exam. Students may only have one make-up an exam with a doctor's note or proof of a death in the immediate family.

**ALL tests will be proctored.**

Final Exam

The Final Exam will be a comprehensive, testing your knowledge of the material for the entire course.

**Late Work, Attendance, and Make Up Work Policies:**

Regular and punctual attendance is expected of all students, and each instructor will maintain a complete record of attendance for the entire length of each course. Students will be counted absent from class meetings missed, beginning with the first official day of classes. Students,

whether present or absent, are responsible for **all** material presented or assigned for a course and will be held accountable for such materials in the determination of course grades.

Absence from **6** scheduled class days (excused or unexcused), will result in the student being withdrawn from the course. If the student's 6th absence is reached after the official drop date, the instructor may assign a W if the student is passing and requests to be withdrawn. However, if a student who is not passing reaches the 6th absence after the official drop date, the student will receive an F. In extenuating circumstances, the instructor may assign a W to a student who is not passing. Each absence (whether excused or unexcused) will count toward attendance requirements in each course.

**Make-up Work:** Students are responsible for all material presented or assigned in class and lab. Students will be held accountable for such materials in the determination of course grades.

If a student misses an **EXAM or LAB COMPETENCY**, the student must provide 1) proof of illness, 2) illness of a family member for whom the student is a caretaker (e.g., single parent) or death in the family, 3) religious holy day or 4) approved college activity and make up Lab competency within one week following the lab Competency date.

If a student fails to follow these instructions for making up a lab competency, the student will receive a zero (0%) for the lab competency and a zero for the missed exam.

**Note:** The instructor has the prerogative of determining whether a student may make up work missed due to absences for other reasons. It is the student's responsibility to inform the instructor of the reason for an absence and to do so in a timely fashion.

**Students are expected to be in class, on time.** For security reasons, the doors to the classroom and lab will be locked from the outside and the doors will remain locked after class starts. If the student cannot be in the classroom or lab by the time class starts, the student will be able to come in during the scheduled break. If the student must leave the classroom or lab for an emergency, the student will quietly pick up course materials and leave the classroom or lab. Since the doors are locked from the outside, the student will not be able to come back into the class or lab until the scheduled break. The students' cooperation is appreciated.

**Lab absences** – will be monitored the same as above. **Leaving early will also be counted as an absence.**

#### **Student Absences on Religious Holy Days**

McLennan Community College shall excuse a student from attending classes or other required activities including examinations for the observance of a religious holy day, including travel for that purpose. Students are required to file a written request with each instructor for an excused absence. A student whose absence is excused for this observance may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence. Religious holy day means a holy day observed by a religion whose places of worship are exempt from property taxation under the Texas Tax Code. McLennan Community College may not excuse absences for religious holy days which may interfere with patient care.

**Student Behavioral Expectations or Conduct Policy:**

Students are expected to maintain classroom decorum that includes respect for other students and the instructor, prompt and regular attendance, and an attitude that seeks to take full advantage of the education opportunity.

**Dress Code**

The student classroom/laboratory is a level 2 biohazard lab. Therefore, students will be required to wear scrubs (preferably the MLT scrubs) and closed toe shoes to class and lab. We are representing our profession and our program. Please see the MLT Student Handbook for more information.

*Cell phones will be turned to silent while you are in class. If you have an urgent situation that requires you to take a call during the class period, please step outside of the classroom so your classmates will not be disturbed. Frequent interruptions of any kind will require counseling with your instructor and program director. Laptop computers may be used in the classroom for note taking or to review posted notes. Playing computer games during class will not be tolerated.*

*All electronic devices will be switched to OFF during exams or quizzes. No exceptions. Only calculators are permitted during exams.”*

**[Click Here for the MCC Attendance/Absences Policy](https://www.mclennan.edu/highlander-guide/policies.html)**

**(<https://www.mclennan.edu/highlander-guide/policies.html>)**

Click on the link above for the college policies on attendance and absences. Your instructor may have additional guidelines specific to this course.

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## ACADEMIC RESOURCES/POLICIES

### **Student Support/Resources:**

MCC provides a variety of services to support student success in the classroom and in your academic pursuits to include counseling, tutors, technology help desk, advising, financial aid, etc. A listing of these and the many other services available to our students is available at <http://www.mclennan.edu/campus-resource-guide/>

College personnel recognize that food, housing, and transportation are essential for student success. If you are having trouble securing these resources or want to explore strategies for balancing life and school, we encourage you to contact a Success Coach by calling (254) 299-8226 or emailing [SuccessCoach@mclennan.edu](mailto:SuccessCoach@mclennan.edu). Students may visit the Completion Center Monday-Friday from 8 a.m.-5 p.m. to schedule a meeting with a Success Coach and receive additional resources and support to help reach academic and personal goals. Paulanne's Pantry (MCC's food pantry) provides free food by appointment to students, faculty and staff based on household size. Text (254) 870-7573 to schedule a pantry appointment. The Completion Center and pantry are located on the Second Floor of the Student Services Center (SSC).

### **MCC Foundation Emergency Grant Fund:**

Unanticipated expenses, such as car repairs, medical bills, housing, or job loss can affect us all. Should an unexpected expense arise, the MCC Foundation has an emergency grant fund that may be able to assist you. Please go to <https://www.mclennan.edu/foundation/scholarships-and-resources/emergencygrant.html> to find out more about the emergency grant. The application can be found at [https://www.mclennan.edu/foundation/docs/Emergency\\_Grant\\_Application.pdf](https://www.mclennan.edu/foundation/docs/Emergency_Grant_Application.pdf).

### **Minimum Technical Skills:**

Students should have basic computer skills, knowledge of word processing software, and a basic understanding of how to use search engines and common web browsers.

### **Backup Plan for Technology:**

In the event MCC's technology systems are down, you will be notified via your MCC student email address. Please note that all assignments and activities will be due on the date specified in the Instructor Plan, unless otherwise noted by the instructor.

### **Minimum System Requirements to Utilize MCC's D2L|Brightspace:**

Go to <https://www.mclennan.edu/center-for-teaching-and-learning/Faculty%20and%20Staff%20Commons/requirements.html> for information on the minimum system requirements needed to reliably access your courses in MCC's D2L|Brightspace learning management system.

**Email Policy:**

McLennan Community College would like to remind you of the policy (<http://www.mclennan.edu/employees/policy-manual/docs/E-XXXI-B.pdf>) regarding college email. All students, faculty, and staff are encouraged to use their McLennan email addresses when conducting college business.

A student's McLennan email address is the preferred email address that college employees should use for official college information or business. Students are expected to read and, if needed, respond in a timely manner to college emails.

**Instructional Uses of Email:**

Faculty members can determine classroom use of email or electronic communications. Faculty should expect and encourage students to check the college email on a regular basis. Faculty should inform students in the course syllabus if another communication method is to be used and of any special or unusual expectations for electronic communications.

If a faculty member prefers not to communicate by email with their students, it should be reflected in the course syllabus and information should be provided for the preferred form of communication.

**Email on Mobile Devices:**

The College recommends that you set up your mobile device to receive McLennan emails. If you need assistance with set-up, you may email [Helpdesk@mclennan.edu](mailto:Helpdesk@mclennan.edu) for help.

**Forwarding Emails:**

You may forward emails that come to your McLennan address to alternate email addresses; however, the College will not be held responsible for emails forwarded to an alternate address that may be lost or placed in junk or spam filters.

**MCC Academic Integrity Statement:**

Go to [www.mclennan.edu/academic-integrity](http://www.mclennan.edu/academic-integrity) for information about academic integrity, dishonesty, and cheating.

**Accommodations/ADA Statement:**

Any student who is a qualified individual with a disability may request reasonable accommodations to assist with providing equal access to educational opportunities. Students should contact the Accommodations Coordinator as soon as possible to provide documentation and make necessary arrangements. Once that process is completed, appropriate verification will be provided to the student and instructor. Please note that instructors are not required to provide classroom accommodations to students until appropriate verification has been provided by the Accommodations Coordinator. For additional information, please visit [www.mclennan.edu/disability](http://www.mclennan.edu/disability).

Students with questions or who require assistance with disabilities involving physical, classroom, or testing accommodations should contact:

[disabilities@mclennan.edu](mailto:disabilities@mclennan.edu)

254-299-8122

Room 319, Student Services Center

**Title IX:**

We care about your safety, and value an environment where students and instructors can successfully teach and learn together. If you or someone you know experiences unwelcomed behavior, we are here to help. Individuals who would like to report an incident of sexual misconduct are encouraged to immediately contact the Title IX Coordinator at [titleix@mclennan.edu](mailto:titleix@mclennan.edu) or by calling Dr. Drew Canham (Chief of Staff for Diversity, Equity & Inclusion/Title IX) at (254) 299-8645. Individuals also may contact the MCC Police Department at 299-8911 or the MCC Student Counseling Center at MCC at (254) 299-8210. The MCC Student Counseling Center is a confidential resource for students. Any student or employee may report sexual harassment anonymously by visiting <http://www.lighthouse-services.com/mclennan/>.

Go to McLennan's Title IX webpage at [www.mclennan.edu/titleix/](http://www.mclennan.edu/titleix/). It contains more information about definitions, reporting, confidentiality, resources, and what to do if you or someone you know is a victim of sexual misconduct, gender-based violence or the crimes of rape, acquaintance rape, sexual assault, sexual harassment, stalking, dating violence, or domestic violence.

**Disclaimer:**

The resources and policies listed above are merely for informational purposes and are subject to change without notice or obligation. The College reserves the right to change policies and other requirements in compliance with State and Federal laws. The provisions of this document do not constitute a contract.