



Course Syllabus

MLAB 1415- HEMATOLOGY

Revision Date: 8/19/2016

Catalog Description: The study of blood cells in normal and abnormal conditions. Instruction in the theory and practical application of hematology procedures, including quality control, quality assurance, safety, manual and/or automated methods as well as blood cell maturation sequences, and normal and abnormal morphology with associated diseases.

Lecture hours = 4, Lab hours = 1

Prerequisites: Enrollment in this course and the Medical Laboratory Technology Program requires department head approval and successful completion of the admissions process. Students must be accepted into the MLT Program.

Semester Credit Hours: 4

Lecture Hours per Week: 4

Lab Hours per Week: 1

Contact Hours per Semester: 128

State Approval Code: 5110040000

Instructional Goals and Purposes: Hematology is the study of blood cells in normal and abnormal conditions. Students will be instructed in the theory and practical application of hematology procedures, including quality control, quality assurance, safety, manual and/or automated methods as well as blood cell maturation sequences, and normal and abnormal morphology with associated disease.

Learning Outcomes:

1. Apply principles of safety, quality assurance and quality control in Hematology.
2. Evaluate specimen acceptability.
3. Compare and contrast hematology values under normal and abnormal conditions.
4. Perform and explain principles and procedures of tests to include sources of error and clinical significance of results.
5. Evaluate normal and abnormal cell morphology with associated diseases.

Specific Course Objectives (includes SCANS):

After studying all materials and resources presented in the course, the student will be able to:

1. **Chapter 3**
 - a. Describe the chemical composition and general function of cellular membranes. **(1a-i. 2c-i,ii)**
 - b. Explain the general membrane activities of diffusion, transport, osmosis, and endocytosis **(1a-i. 2c-i,ii.)**
 - c. Name and describe the function of cellular organelles of mammals. **(1a-i. 2c-i,ii)**
 - d. Describe the features of the nucleus. **(1a-i. 2c-i,ii)**
 - e. Describe the processes of mitosis and meiosis. **(1a-i. 2c-i,ii)**
 - f. Define the acronym FISH. **(1a-i. 2c-i,ii)**
2. **Chapter 4**

- a. Explain the origin of blood cells and trace the sequential sites of cellular proliferation and development. **(1a-i. 2c-i,ii,iii.)**
 - b. Describe the development of hematopoietic progenitor cells. **(1a-i. 2c-i,ii,iii)**
 - c. Name three growth factors. **(1a-i. 2c-i,ii)**
 - d. Name the cells in developmental order in maturation sequence of erythrocytes, thrombocytes, and the five leukocyte types. **(1a-i. 1b-iv. 2c-i,ii)**
 - e. Name two overall features of a cell that are important for identification of a cell. **(1a-i. 1b-iv. 2c-i,ii)**
 - f. Compare the cytoplasmic features of color, granulation, shape, quantity, vacuolization, and inclusions to cell maturity. **(1a-i. 1b-iv. 2c-i,ii)**
 - g. Name and describe the average percentage and cellular characteristics of the six mature leukocytes found in normal peripheral blood. **(1a-i. 1b-iv. 2c-i,ii)**
3. **Chapter 5**
- a. Name the sites of erythropoiesis from early embryonic stage of development until fully established in adults. **(1a-i.)**
 - b. Define the terms shift or stress reticulocytes. **(1a-i.)**
 - c. Compare the morphological appearances of reticulocytes stained with Wright stain and new methylene blue. **(1b-v.)**
 - d. Give the normal value of the uncorrected reticulocyte count. **(2c-i,ii,iii)**
 - e. When given the necessary lab results, calculate the corrected reticulocyte count. **(1a-iii)**
 - f. Describe the chemical configuration of normal adult hemoglobin. **(1a-i. 2c-i,ii)**
 - g. Explain the elimination and transport of carbon dioxide. **(1a-i. 2c-i,ii)**
 - h. Identify the types adult hemoglobin. **(1a-i. 2c-i,ii)**
 - i. Describe the correlation of HgbA1C in patient care. **(1a-i.1b-vi. 2c-i,ii)**
 - j. Describe the pathophysiology of sideroblastic anemia. **(1a-i. 2c-i,ii)**
 - k. List the remarkable laboratory characteristics of sideroblastic anemia. **(1a-i. 2c-i,ii)**
 - l. Name and describe the variant forms of normal hemoglobin. **(1a-i. 2c-i,ii)**
 - m. Cite the normal values of the erythrocyte count, hemoglobin, and packed cell volumes for various age groups. **(1a-i. 2c-i,ii)**
 - n. Define each of the erythrocyte indices: mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC). **(1a-i. 2c-i,ii)**
 - o. Apply the appropriate formulas and calculate the MCV, MCH, and MCHC when give the erythrocyte values. **(1a-iii)**
4. **Chapter 6**
- a. Identify in a smear, name and describe the variations in the size of a mature RBC. **(1b-ii,iii,iv,v,vi)**
 - b. Identify in a smear and correlate at least one clinical condition with each of the RBC size variations: anisocytosis, macrocytosis, microcytosis. **(1b-ii,iii,iv,v,vi)**
 - c. Explain the terms used with a mature RBC assumes an irregular shape. **(1a-i.1b-ii,iii,iv,v,vi)**
 - d. Identify in a smear and correlate at least one condition with each of the RBC shape variations: acanthocytes, blister cells, burr cells, crenated red cells, elliptocytes, keratocytes, knizocytes, leptocytes, poikilocytosis, pyknocytes, schistocytes, sickle cells, spherocytes, stomatocytes, and teardrops. **(1b-ii,iii,iv,v,vi)**
 - e. Describe the alterations in color that can be seen in a erythrocyte. **(1a-i.1b-ii,iii,iv,v,vi)**
 - f. Correlate at least one clinical condition with hypochromia and polychromatophilia.
 - g. Identify in a smear, name and describe the appearance of RBC inclusions in a variety of abnormal conditions. **(1b-ii,iii,iv,v,vi)**
 - h. Explain the cellular or clinical basis of inclusions. **(1a-i.1b-ii,iii,iv,v,vi)**
 - i. Identify in a smear and correlate at least on clinical condition with the following RBC inclusions: basophilic stippling, Cabot rings, Heinz bodies, hemoglobin C crystals, Howell-Jolly bodies, Pappenheimer bodies, and siderotic granules. **(1b-ii,iii,iv,v,vi)**
 - j. Define the alterations in RBC distribution that may be encountered when examining a blood smear and the clinical conditions related to them. **(1a-i.1b-ii,iii,iv,v,vi)**
 - k. Name and describe the morphology of malaria, Babesia, and leishmania parasites on a peripheral blood smear. **(1b-ii,iii,iv,v,vi)**
5. **Chapter 7**

- a. Define the term anemia, based on physiological description. **(1a-i.)**
 - b. Name three causes of anemia. **(1a-i.)**
 - c. State the causes of the clinical signs and symptoms of anemia. **(1a-i.)**
 - d. Explain the advantage of categorizing anemias on a physiological basis. **(1a-i.1b-v. 2c-i,ii,iii)**
 - e. List the three laboratory manifestations of anemia. **(1a-i. 2c-i,ii,iii)**
 - f. Explain the grading system and proper slide reading technique used to describe erythrocyte abnormalities on a peripheral blood slide. **(1a-i. 2c-i,ii,iii.2d-i.)**
 - g. Name the hematology laboratory tests used to assist in the diagnosis of anemia. **(1a-i. 2c-i,ii,iii)**
 - h. Name the laboratory tests performed in OTHER sections that assist in the diagnosis of anemia. **(1a-i. 2c-i,ii,iii)**
6. **Chapter 8**
- a. Describe the etiology and physiology of acute blood loss. **(1a-i. 2c-i,ii,iii)**
 - b. Explain the significant hematological findings in acute blood loss. **(1a-i. 2c-i,ii,iii)**
 - c. Describe the etiology and physiology of chronic blood loss. **(1a-i. 2c-i,ii,iii)**
 - d. Explain the significant hematological findings in chronic blood loss. **(1a-i. 2c-i,ii,iii)**
7. **Chapter 9**
- a. Describe the major characteristics of acquired aplastic anemia. **(1a-i. 2c-i,ii,iii)**
 - b. Define the term iatrogenic. **(1a-i.)**
 - c. List three iatrogenic substances that can cause aplastic anemia. **(1a-i. 2c-i,ii,iii)**
 - d. Name 4 viral infections that have been associated with acquired aplastic anemia. **(1a-i. 2c-i,ii,iii)**
 - e. Describe the clinical features of acquired aplastic anemia. **(1a-i. 2c-i,ii,iii)**
 - f. Discuss the laboratory findings in acquired aplastic anemia (pertaining to ALL cells lines). **(1a-i.1b-v. 2c-i,ii,iii)**
 - g. List the forms of aplastic anemia. **(1a-i. 1b-i,ii,iv,v,vi.2c-i,ii,iii)**
 - h. Identify the cause of pure red cell aplasia. **(1a-i. 2c-i,ii,iii)**
 - i. Describe the characteristics of Diamond-Blackfan syndrome. **(1a-i. 2c-i,ii,iii)**
 - j. Describe the mode of inheritance of Fanconi anemia. **(1a-i. 2c-i,ii,iii)**
 - k. Describe the characteristics of Fanconi anemia. **(1a-i. 2c-i,ii,iii)**
 - l. Name the 4 types of congenital dyserythropoietic anemia, describe the characteristics and lab findings. **(1a-i. 1b-i,ii,iv,v,vi.2c-i,ii,iii)**
 - m. Define the critical values for platelets, granulocytes, and retics (as they relate to aplastic anemia). **(1a-i. 1b-i,ii,iv,v,vi.2c-i,ii,iii)**
8. **Chapter 10**
- a. Name three conditions that contribute to iron deficiency anemia (IDA). **(1a-i.)**
 - b. Name the three groups most vulnerable to IDA. **(1a-i.)**
 - c. Characterize the signs and symptoms of IDA. **(1a-i. 2c-i,ii,iii)**
 - d. Describe the etiological basis of anemia of chronic inflammation or chronic disorders. **(1a-i. 2c-i,ii,iii)**
 - e. Discuss the laboratory characteristics of anemia of chronic inflammation/chronic disorders. **(1a-i. 2c-i,ii,iii)**
9. **Chapter 11**
- a. List 4 causes of vitamin B12 deficiency. **(1a-i. 2c-i,ii,iii)**
 - b. List 3 causes of folic acid deficiency. **(1a-i. 2c-i,ii,iii)**
 - c. Briefly describe the epidemiology and occurrence of pernicious anemia. **(1a-i. 2c-i,ii,iii)**
 - d. Discuss the clinical signs, symptoms, and laboratory findings in megaloblastic anemia. **(1a-i. 2c-i,ii,iii)**
 - e. Explain the usual management of and therapy for pernicious anemia. **(1a-i. 2c-i,ii,iii)**
 - f. Compare megaloblastic anemia caused by folic acid deficiency with pernicious anemia. **(1a-i.1b-v. 2c-i,ii,iii)**
10. **Chapter 12**
- a. Define the term hemolytic anemia. **(1a-i.)**
 - b. Define pancytopenia. **(1a-i.)**
 - c. Explain the basis of structural membrane defects. **(1a-i. 2c-i,ii,iii)**

- d. Name the five types of membrane defects and their appearance on the peripheral blood smear. **(1a-i.1b-ii,iii,iv,v,vi)**
 - e. Name the three categories of acquired hemolytic anemia. **(1a-i.)**
 - f. Name three types of autoimmune hemolytic anemia. **(1a-i.)**
 - g. Describe the physiology and typical lab findings in G6PD anemia. **(1a-i.1b-ii,iii,iv,v,vi)**
 - h. Describe the signs, symptoms, lab findings, and treatment of PNH. **(1a-i.1b-ii,iii,iv,v,vi)**
11. **Chapter 13**
- a. List the common feature of red cell morphology (seen on a peripheral smear) in hemoglobinopathies. **(1a-i.1b-ii,iii,iv,v,vi)**
 - b. Name the three major categories to classify hemoglobin defects. **(1a-i.1b-v. 2c-i,ii,iii)**
 - c. Describe the etiology, signs, symptoms, and lab findings in Sickle Cell Disease (SCD) and Sickle Cell Crisis (SCC). **(1a-i.1b-ii,iii,iv,v,vi)**
 - d. Explain the value of hemoglobin electrophoresis SCD. **(1a-i.1b-v. 2c-i,ii,iii)**
 - e. Discuss the prognosis and treatment of SCD. **(1a-i.1b-v. 2c-i,ii,iii)**
 - f. Describe sickle β -thalassemia, sickle-C (SC), and sickle cell trait. **(1a-i.1b-v. 2c-i,ii,iii)**
 - g. Describe the features, types, and common lab findings in thalassemia. **(1a-i.1b-ii,iii,iv,v,vi)**
 - h. Define and understand the terms heterozygous and homozygous as they related to genetic inheritance (in this case sickle cell anemia). **(1a-i.1b-v. 2c-i,ii,iii)**
 - i. Describe the general characteristics of Hb C disease, Hb SC disease, Hb D disease, Hb E disease, Hb H disease, methemoglobinemia, and unstable hemoglobins. **(1a-i.1b-ii,iii,iv,v,vi)**
12. **Chapter 14**
- a. List the Granulocytic and Monocytic cells. **(1a-i.1b-ii,iii,iv,v,vi)**
 - b. List the first identifiable cell of each cell line. **(1a-i.1b-ii,iii,iv,v,vi)**
 - c. Compare and contrast the nuclear and cytoplasmic characteristics granulocytic and monocytic cells. **(1a-i.1b-v. 2c-i,ii,iii)**
 - d. Describe the general characteristic and stages of phagocytosis. **(1a-i.1b-ii,iii,iv,v,vi)**
 - e. Describe the function of the each granulocytic and monocytic cells. **(1a-i.1b-v. 2c-i,ii,iii)**
 - f. Discuss the specialized functions of eosinophils, basophils, and monocytes. **(1a-i.1b-v. 2c-i,ii,iii)**
 - g. Describe the characteristics of sepsis syndrome. **(1a-i.1b-v. 2c-i,ii,iii)**
 - h. Explain the appearance and etiology of the various morphological abnormalities encountered in mature granulocytes (i.e. inclusions, hypo- and hyper-segmented). **(1a-i.1b-ii,iii,iv,v,vi)**
13. **Chapter 15**
- a. Define the terms leukocytosis and leukopenia. **(1a-i.)**
 - b. Describe the appearance of cells when the following abnormalities are present:
 - i. Toxic Granulation
 - ii. Dohle Bodies
 - iii. Hypersegmentation
 - iv. Pelger-Huet anomaly
 - v. May-Hegglin anomaly
 - vi. Chediak-Higashi syndrome
 - vii. Alder-Reilly inclusions\
 - viii. Ehrlichia**(1a-i.1b-ii,iii,iv,v,vi)**
 - c. Identify the defects that cause Gaucher disease and Niemann-Pick disease. **(1a-i.1b-v. 2c-i,ii,iii)**
14. **Chapter 16**
- a. Describe the major function of T, B, and natural killer (NK) cells. **(1a-i.1b-v. 2c-i,ii,iii)**
 - b. State at least three conditions associated with specific lymphocytic abnormalities that may be seen in peripheral blood. **(1a-i.1b-v. 2c-i,ii,iii)**
 - c. Compare the normal percentages of lymphocytes at different ages ranging from birth to adulthood**(1a-i.1b-ii,iii,iv,v,vi)**.
 - d. Define immunocompetent. **(1a-i.)**
 - e. Discuss the morphological abnormalities of variant lymphocytes. **(1a-i.1b-v. 2c-i,ii,iii)**
 - f. Describe the appearance and cytoplasmic contents of Russell bodies, Mott cells, and flame cells. **(1a-i.1b-ii,iii,iv,v,vi)**
15. **Chapter 17**

- a. Describe the etiology, epidemiology, clinical signs and symptoms, and laboratory data for at least two disorders association with lymphocytosis. **(1a-i.1b-v. 2c-i,ii,iii)**
 - b. Name at least three disorders associated with lymphocytosis. **(1a-i.1b-v. 2c-i,ii,iii)**
 - c. Name three disorders associated with lymphocytopenia. **(1a-i.1b-v. 2c-i,ii,iii)**
16. **Chapter 18**
- a. Define and compare the characteristics of leukemia, lymphoma, and myeloma. **(1a-i.1b-v. 2c-i,ii,iii)**
 - b. Describe the terms acute and chronic leukemia. **(1a-i.)**
 - c. List the traditional forms of the major types of leukemia. **(1a-i.)**
 - d. Correlate patient age to the overall incidence of various leukemias. **(1a-i.1b-ii,iii,iv,v,vi)**
17. **Chapter 19**
- a. Compare and contrast ALL and AML. **(1a-i.1b-ii,iii,iv,v,vi)**
 - b. Describe the common laboratory characteristic found in all acute leukemias. **(1a-i.1b-v. 2c-i,ii,iii)**
 - c. Describe erythroleukemia. **(1a-i.1b-v. 2c-i,ii,iii)**
 - d. Define leukostasis. **(1a-i.)**
 - e. Describe the basis of the FAB and WHO systems for the classification of leukemias. **(1a-i.1b-ii,iii,iv,v,vi)**
18. **Chapter 20**
- a. Describe the general characteristics and laboratory data in multiple myeloma. **(1a-i.1b-v. 2c-i,ii,iii)**
 - b. Describe the general characteristics, including laboratory data of chronic lymphocytic leukemia (CLL). **(1a-i.1b-ii,iii,iv,v,vi)**
 - c. Describe the characteristics of Hodgkin disease. **(1a-i.1b-v. 2c-i,ii,iii)**
 - d. Describe the general characteristics and laboratory data in Waldenstrom macroglobulinemia (WM). **(1a-i.1b-ii,iii,iv,v,vi)**
19. **Chapter 21**
- a. Describe the etiology and treatment of polycythemia vera. **(1a-i.1b-ii,iii,iv,v,vi)**
 - b. Describe the epidemiology, progression and characteristics of CML. **(1a-i.1b-v. 2c-i,ii,iii)**
 - c. Define "blast crisis". **(1a-i.)**
 - d. Define "leukemoid reaction" and discuss how it is distinguished from CML. **(1a-i.1b-v. 2c-i,ii,iii)**
 - e. Describe the most common disorder in patients with essential thrombocytopenia. **(1a-i.1b-v. 2c-i,ii,iii)**
20. **Chapter 22**
- a. Describe the pathophysiology of MDSs. **(1a-i.1b-ii,iii,iv,v,vi)**
 - b. Describe the age and gender distribution of MDSs. **(1a-i.1b-v. 2c-i,ii,iii)**
 - c. Explain the forms of treatment and supportive care for the MDSs. **(1a-i.1b-v. 2c-i,ii,iii)**
 - d. Explain predisposing factors of primary and secondary MDSs. **(1a-i.1b-v. 2c-i,ii,iii)**
 - e. Itemize the cellular alternations in MDSs. **(1a-i.1b-ii,iii,iv,v,vi)**
21. **Lab #1:**
(1a-i.1b-ii,iii,iv,v,vi,2a-i.2b-i,ii,v,vi.2c-i,ii,iii.2e-i,ii,iii)
- a. Identify a normal red blood cell (RBC) on a stained slide. Describe (in words) the characteristics of a normal red blood cell.
 - b. Explain the FUNCTION of the red blood cell in the body.
 - c. Identify cells that are white blood cells (WBC) on a stained smear (not required to differentiate until next lab).
 - d. Identify normal platelets on a stained slide.54. Understand the meanings and uses of the MCV, MCH, and MCHC on a Hematology analyzer report
 - e. Define normochromic and normocytic as it pertains to red blood cells.
 - f. Identify common RBC morphologies: hypochromia, polychromia, anisocytosis, poikilocytosis, acanthocytes, burr cells, sickle cells (drepanocytes), target cells, tear drop cells (dacryocytes), stomatocytes, schistocytes, microcytosis, macrocytosis.)
22. **Lab #2**
(1a-i.1b-ii,iii,iv,v,vi,2a-i.2b-i,ii,v,vi.2c-i,ii,iii.2e-i,ii,iii)
- a. Define lymphocytopenia.
 - b. List approximate the normal ranges for WBC, RBC, Hgb, Hct, Platelet.

- c. Read a CBC printout/report and interpret results. Given the reference ranges, determine if the patient's results are high, low, or normal.
- d. Identify RBCs, WBCs, and platelets on a slide.
- e. Differentiate the different WBCs on a slide: segmented neutrophils (segs), band neutrophils (bands), lymphocytes (lymphs), monocytes (monos), basophils (basos), and eosinophils (eos).
- f. Define leukocyte.
- g. Be able to describe (in words) the appearance/characteristics of the different WBCs (seg, band, lymph, mono, baso, eo).
- h. Define the requirements of a WBC differential.
- i. Perform a WBC differential on unknown slides and match the instructor within a given margin of error.

23. **Lab #3**

(1a-i.1b-ii,iii,iv,v,vi,2a-i.2b-i,ii,v,vi.2c-i,ii,iii.2e-i,ii,iii)

- a. Independently read 3-5 slide differentials, matching the technologist within stated percentage.

Course Content:

A general description of lecture/discussion topics included in this course are listed in the Learning Objectives / Specific Course Objectives sections of this syllabus.

Students in all sections of this course will be required to do the following:

- 1. Lecture Assignments (21)
- 2. Lecture Quizzes (21)
- 3. Lecture Exams (3)
- 4. Lecture Final Exam
- 5. Pre-Lab Quizzes (6)
- 6. Lab Assignments – in lab class (6)
- 7. Post Lab Cases (4)
- 8. Lab Practicals (3)

Methods of Instruction/Course Format/Delivery:

This is a mainly online course so it will require a lot of outside proactive work by the student. The instructor will provide guidance as needed. The student will be evaluated by assignments and quizzes outside of the classroom. The student will be required to come to a Panola College testing Center to take all major examinations. Laboratories will take place on three pre-determined Saturdays during the semester and will be mandatory. During the laboratories the students will be evaluated by case studies, in-lab assignments, and lab practicals as assigned by the instructor.

Major Assignments / Assessments:

The following items will be assigned and assessed during the semester and used to calculate the student's final grade.

Assignments

- 1. Introductions discussion
- 2. Chapters 4-22 Assignments
- 3. Mitosis Quiz
- 4. Chapters 3-22 Quizzes
- 5. In-lab work- RBCs, WBCs, Differentials
- 6. Pre-lab quizzes
 - a. Safety
 - b. Microscope
 - c. Erythrocyte Identification
 - d. WBC Identification
 - e. WBC Abnormals
- 7. Post-Lab Cases 1-4

Assessment(s):

1. Proctored Exams #1, #2, #3
2. Final Exam
3. Lab Practicals 1, 2, 3

Course Grade:

The grading scale for this course is as follows:

- **Lecture-- 2/3 of Final Grade**
 - Major Exams-- 50%
 - Quizzes-- 15%
 - Homework Assignments-- 20%
 - Final Exam-- 15%
- **Laboratory— 1/3 of Final Grade**
 - Pre-Lab Quizzes-- 10%
 - Case Assignments-- 20%
 - In- Lab Assignments-- 20%
 - Practicals-- 50%

Texts, Materials, and Supplies:

- Turgeon, Mary Louise. (2012). *Clinical Hematology: Theory & Procedures 5th ed.* Baltimore: Lipincott Williams & Wilkins.
- Harmening, Denise and Finnegan, Kathleen (2014). *Heme Notes: A Pocket Atlas of Cell Morphology.* Philadelphia: F.A. Davis.
- White Lab Coat

Required Readings:

- Course Textbooks
- All information give in Canvas

Recommended Readings:

- Medical Dictionary (reference)
- LabTestsOnline.org (reference)

Other:

- For current texts and materials, use the following link to access bookstore listings: <http://www.panolacollegestore.com>
- For testing services, use the following link: <http://www.panola.edu/elearning/testing.html>
- If any student in this class has special classroom or testing needs because of a physical learning or emotional condition, please contact the ADA Student Coordinator in Support Services located in the Administration Building or go to <http://www.panola.edu/student-success/disability-support-services/> for more information.
- Withdrawing from a course is the student's responsibility. Students who do not attend class and who do not withdraw will receive the grade earned for the course.
- Student Handbook, *The Pathfinder*: <http://www.panola.edu/student-success/documents/pathfinder.pdf>

More Information:

Laboratory Dress Code

The student will be expected to attend class clean and neatly dressed in long pants or scrubs and wear closed-toe shoes. A laboratory coat will must be worn snapped or buttoned up during all laboratory sessions. Hair that is shoulder length or longer must be worn up or securely tied back. Gloves must be worn when handling biological materials.

Behavioral Conduct

While a student is representing Panola College as a Medical Laboratory Technology student, they will be expected to conduct themselves in such a manner as to reflect favorably on themselves and on the Program. If a student acts in such a manner as to reflect immature judgment or disrespect for others, the student will be called before the MLT Department Chair for determination of their status in the Program. Inappropriate conduct is grounds discipline and may be cause for immediate probation or dismissal from the Program.

Academic Dishonesty

Under no circumstances shall a student submit work that is not their own. Copying answers for study questions, cheating on exams and/or submitting laboratory results which are not your own are expressly prohibited.

Time Commitment

According to "Hints on How to Succeed in College Classes"

<http://tinyurl.com/3dqegz> you should budget your time per week for this four hour credit course as follows:

1. Reading assigned text 2 to 3 hours
2. Homework assignments 3 to 6 hours
3. Time for review and test preparation 3 hours
4. Total study time per week 8 to 12 hours PER WEEK

SCANS CRITERIA

- 1) **Foundation skills are defined in three areas: basic skills, thinking skills, and personal qualities.**
 - a) **Basic Skills:** A worker must read, write, perform arithmetic and mathematical operations, listen, and speak effectively. These skills include:
 - i) Reading: locate, understand, and interpret written information in prose and in documents such as manuals, graphs, and schedules.
 - ii) Writing: communicate thoughts, ideas, information, and messages in writing, and create documents such as letters, directions, manuals, reports, graphs, and flow charts.
 - iii) Arithmetic and Mathematical Operations: perform basic computations and approach practical problems by choosing appropriately from a variety of mathematical techniques.
 - iv) Listening: receive, attend to, interpret, and respond to verbal messages and other cues.
 - v) Speaking: Organize ideas and communicate orally.
 - b) **Thinking Skills:** A worker must think creatively, make decisions, solve problems, visualize, know how to learn, and reason effectively. These skills include:
 - i) Creative Thinking: generate new ideas.
 - ii) Decision Making: specify goals and constraints, generate alternatives, consider risks, and evaluate and choose the best alternative.
 - iii) Problem Solving: recognize problems and devise and implement plan of action.
 - iv) Visualize ("Seeing Things in the Mind's Eye"): organize and process symbols, pictures, graphs, objects, and other information.
 - v) Knowing How to Learn: use efficient learning techniques to acquire and apply new knowledge and skills.
 - vi) Reasoning: discover a rule or principle underlying the relationship between two or more objects and apply it when solving a problem.
 - c) **Personal Qualities:** A worker must display responsibility, self-esteem, sociability, self-management, integrity, and honesty.
 - i) Responsibility: exert a high level of effort and persevere toward goal attainment.
 - ii) Self-Esteem: believe in one's own self-worth and maintain a positive view of oneself.
 - iii) Sociability: demonstrate understanding, friendliness, adaptability, empathy, and politeness in group settings.
 - iv) Self-Management: assess oneself accurately, set personal goals, monitor progress, and exhibit self-control.
 - v) Integrity and Honesty: choose ethical courses of action.
- 2) **Workplace competencies are defined in five areas: resources, interpersonal skills, information, systems, and technology.**
 - a) **Resources:** A worker must identify, organize, plan, and allocate resources effectively.
 - i) Time: select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
 - ii) Money: Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
 - iii) Material and Facilities: Acquire, store, allocate, and use materials or space efficiently. Examples: construct a decision time line chart; use computer software to plan a project; prepare a budget; conduct a cost/benefits analysis; design an RFP process; write a job description; develop a staffing plan.
 - b) **Interpersonal Skills:** A worker must work with others effectively.
 - i) Participate as a Member of a Team: contribute to group effort.
 - ii) Teach Others New Skills.
 - iii) Serve Clients/Customers: work to satisfy customer's expectations.

- iv) **Exercise Leadership:** communicate ideas to justify position, persuade and convince others, responsibly challenge existing procedures and policies.
- v) **Negotiate:** work toward agreements involving exchange of resources, resolve divergent interests.
- vi) **Work with Diversity:** work well with men and women from diverse backgrounds.

Examples: collaborate with a group member to solve a problem; work through a group conflict situation, train a colleague; deal with a dissatisfied customer in person; select and use appropriate leadership styles; use effective delegation techniques; conduct an individual or team negotiation; demonstrate an understanding of how people from different cultural backgrounds might behave in various situations.

- c) **Information:** A worker must be able to acquire and use information.

- i) **Acquire and Evaluate Information.**
- ii) **Organize and Maintain Information.**
- iii) **Interpret and Communicate Information.**
- iv) **Use Computers to Process Information.**

Examples: research and collect data from various sources; develop a form to collect data; develop an inventory record-keeping system; produce a report using graphics; make an oral presentation using various media; use on-line computer data bases to research a report; use a computer spreadsheet to develop a budget.

- d) **Systems:** A worker must understand complex interrelationships.

- i) **Understand Systems:** know how social, organizational, and technological systems work and operate effectively with them.
- ii) **Monitor and Correct Performance:** distinguish trends, predict impacts on system operations, diagnose deviations in systems' performance and correct malfunctions.
- iii) **Improve or Design Systems:** suggest modifications to existing systems and develop new or alternative systems to improve performance.

Examples: draw and interpret an organizational chart; develop a monitoring process; choose a situation needing improvement, break it down, examine it, propose an improvement, and implement it.

- e) **Technology:** A worker must be able to work with a variety of technologies.

- i) **Select Technology:** choose procedures, tools or equipment including computers and related technologies.
- ii) **Apply Technologies to Task:** understand overall intent and proper procedures for setup and operation of equipment.
- iii) **Maintain and Troubleshoot Equipment:** Prevent, identify, or solve problems with equipment, including computers and other technologies.

Examples: read equipment descriptions and technical specifications to select equipment to meet needs; set up and assemble appropriate equipment from instructions; read and follow directions for troubleshooting and repairing equipment.