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BIOH 405.01: Hematology

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Syllabus BIOH 405 – Hematology – Fall 2014

Lecture Classroom: Skaggs Building Room 025, M W 12:10 – 1:00 pm

Lab Classroom: Health Sciences Room 404 T 1:10 pm – 3:00 pm

Course Instructor:

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Course Description and Intended Audience:

This course is intended to introduce the student to normal and pathologic hematology, with emphasis on cell development, cellular components and morphology. Laboratory exercises will instruct the student in proper specimen collection, preparation of peripheral blood smears, microscopic examination of blood smears, and other manual tests associated with blood and coagulation studies. Lectures will include discussion of actual clinical cases. While primarily designed for those students enrolled in the Microbiology Medical Technology option, this class is beneficial for any student involved in a health sciences career path. For the Med Tech majors, the class is designed to prepare the student for their year of internship, as well as preparation for the national certifying exam – Board of Registry, American Society for Clinical Pathology (BOR ASCP). For the non-Med Tech major, an understanding of normal and pathologic hematology will be beneficial in the overall understanding of their patients, the diseases they encounter and the treatments they are prescribed.

Course Materials:

Textbook Materials Required:

1. Hematology: Clinical Principles and Applications. Rodak. Elsevier 2011. ISBN: 1437706924
2. Clinical Hematology Atlas. Carr. Elsevier 2012. ISBN: 1455708305
3. Fac-Pac for lab. Contains all lab exercises. Available at UM Bookstore.

Moodle Supplement:

1. This course includes a Moodle supplement. All notes from lecture will be posted on Moodle the week before lecture. Important handouts our web resources will also be listed here. Notes are to be used to review material and as a guide for studying for tests. Handouts are offered as an option to print and bring to class for easier note taking. The slides are also numbered, so an option to printing the handouts is to jot a slide number that you are making a note about to reference as you review the slides. If you have not used Moodle before, be sure to take the online tutorial.

Laboratory Equipment:

1. Each student will be responsible for having a laboratory coat at each lab. Space will be provided to store the coat in the lab. Failure to wear a lab coat and closed toed shoes will result in being asked to leave the class, which will count as an unexcused absence.
2. Safety glasses or goggles are recommended but not required. Eyeglasses are acceptable.

Learning Outcomes:

1. The student will have a solid understanding of laboratory safety practices and know exactly what is required for Universal Standards practices in clinical laboratories.
2. The student will be able to define quality control and quality assurance and how each is properly utilized in a clinical laboratory to assure the best patient outcomes.
3. The student will gain knowledge of correct specimen collection procedures and the importance behind those procedures. Phlebotomy will be demonstrated and the student will be tested on principles, but actual blood drawing by students will not be done in this class.
4. The student will become adept at using the microscope properly.
5. The student will prepare peripheral blood smears and reticulocyte smears; and learn to identify the various normal and abnormal cellular components.
6. The student will be able to describe the normal production and destruction of hematopoietic cells, as well as the metabolism of hemoglobin and iron.
7. The student will learn a multitude of pathologic conditions resulting from metabolic, genetic, and acquired conditions.
8. The student will gain an understanding of identifying abnormal results, and how to interpret those results.
9. The student will gain an understanding of hemostasis (coagulation), disorders of hemostasis and current laboratory tests used for hemostasis.
10. The student will learn how other body fluids such as synovial fluid or cerebral spinal fluid is used in clinical diagnosis.
11. The student will learn how to make a differential diagnosis. An actual clinical case will be assigned each student. The student will examine a peripheral blood smear and based on the abnormal criteria he/she observes, make educated guesses as to the pathology involved. He/she will then list other laboratory or diagnostic testing that could be ordered to further confirm a suspected pathology. The ultimate goal of clinical pathology is to unravel a mystery using patient symptoms, laboratory and other diagnostic testing to diagnose and treat disease. Physicians rely heavily on clinical laboratory testing. Proficiency in proper specimen collection, testing (including proper QC/QA), and interpretation are key to best care patient practices.

Grading:

Total Points and Grading Policy:

Final grade will be determined as a percentage of points based on the following: 3 lecture/lab tests, 10 quizzes, 5 lab exercises, lab final, lecture final, and workup of a clinical unknown blood smear. Pass-Fail grade: students in the P/F status must earn the equivalent of a "C" grade for a P. I do not grade on a curve.

Total lecture/lab tests:	250 pts. (Test 1&2: 100 pts. each, Test 3: 50 pts.)
Quizzes	115 (Quiz 1: 25 pts., Quiz 2-9: 10 pts. each)
Lab exercises	50 (10 pts. X 5)
Blood smear (unknown)	25
Final test (lecture)	100
Final test (lab)	50
Total Possible:	590

A+	97-100
A	93-96.9
A-	90-92.9
B+	87-89.9
B	83-86.9
B-	80-82.9
C+	77-79.9
C	73-76.9
C-	70-72.9
D+	67-69.9
D	63-66.9
D-	60-62.9
F	Below 60

Course Expectations and Requirements:

Prerequisites:

BIOM 360/361 General Microbiology or equivalent or by consent of the instructor.

Attendance:

Attendance is expected in all lectures and laboratory sessions. There will be information shared in lecture that is not in the notes or the text. Absence from lectures will cause you to miss important content. Quizzes and/or laboratory exercises may not be made up. **More than two unexcused absences from lab will result in lowering of final grade by one letter grade point.** Tests may only be made up with prior approval of the instructor and will require **legitimate documentation** of reason for absence. Examples of documented circumstances that may merit approval include the following: 1) illness or accident, 2) death or family emergency, 3) university sanctioned activity.

Reading Requirements:

Reading requirements are spelled out on the schedule. Students are expected to read the required reading **before** class – especially the lab FacPac (see explanation of quizzes below). The text as a whole will go into more detail than I will in lecture, however, it helps to understand the big picture. The quizzes at the end of the chapters are helpful for review; with answers in the back of the text to self check your answers. I recommend taking the time to do these quizzes – it will really help you understand the main points.

Tests, quizzes, lab exercises, and clinical unknown assignment:

There will be three mid-term non-cumulative tests that combine information from the lecture and lab. The lecture final will be cumulative as will the lab final. The lab final will include visually identifying cells and cell components from power point slides. The quizzes will be as follows: at the start of every lab, a ten-point quiz will be given. Some of the questions will be from the required reading for that day's lab to be sure you understand what it is you will be doing in lab that day. The rest of the questions will be review questions from the last two previous lectures. These quizzes are designed to help keep you on track and up to speed. There is a tremendous amount of material to cover in this course. It is not particularly difficult, but if you fall behind, catching up will be an uphill battle. As mentioned before, quizzes cannot be made up, so missing lab will hurt you in more ways than one. Finally, the clinical unknown assignment will consist of reviewing a peripheral blood smear from a real clinical case. You will learn how to do this in the labs. You will offer potential diagnoses, as well as additional tests that would help differentiate possible disease states. This is a fun exercise and helps you to see what value the Medical Technologist offers to the overall care of a patient. This class is one of the more hands-on, relevant courses of your education. Enjoy it, learn it and apply it!

Email Communications:

I will use email to communicate schedule changes and other notifications. I will only use the official University email address, so be sure to check your email regularly.

Professionalism and Classroom Etiquette:

Medical Technologists, Physical Therapists, Pharmacists, Exercise Physiologists, Dieticians, Nurses, etc. are all considered professionals in the health care field. Being enrolled in this class, you are expected to act professional at all times, observing safety standards, confidentiality rules, and demonstrating ethical behavior. Please be on time to class, turn off all cell phones and leave them out of sight. Laptops and tablets are acceptable only if they are used for note taking or following notes on Moodle. No cell phones, computers, or other electronic devices may be used during exams. Some basic math will be utilized on tests, but you will be expected to perform these functions without aid.

Students with Disabilities:

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). If you think you may have a disability with the potential to adversely affect your academic performance, and you have not already registered with DSS, please contact DSS in Lommasson 154 (phone: 243-2243) or consult their website: <http://life.umt.edu/dss>. Please let me know as soon as possible about any assistance you may need. I will work with you and DSS to provide an appropriate accommodation.

University Policy for drops, adds, or changes of grade option:

It is the student's responsibility to know the required dates for drops, adds or changes of grade option. I will not bend the rules on this. Please consult the registrar's website for specifics.

<http://www.umt.edu/registrar/students/dropadd.php>

Academic Honesty and Misconduct:

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. Anyone caught plagiarizing or cheating on an exam or assignment will be given a grade of "F" for the course and will be reported to the Department Chair and the Dean of Students. All students must be familiar with the Student Conduct Code. The code is available for review online at: http://www.umt.edu/vpsa/policies/student_conduct.php

Emergency Preparedness and Response:

Should an emergency of any type develop, please observe the following:

1. In the event we need to evacuate the building during lecture, our primary route will be through the classroom door to the stairwell, up one flight and out through the Skaggs lobby door. During the laboratory sessions in Health Sciences building, we will exit through the classroom down the nearest stairwell to the ground floor and out the nearest exit.
2. If you hear an alarm or are told to evacuate, always assume the emergency is real. Without panic, pick up your backpack, coat and valuables as the building may be closed for some time.
3. Do not use elevators as a means of evacuating.
4. In the event of a lock down, please follow all directions. If you are asked to stay in the classroom, please do so. If you have text enabled emergency notifications, you may use your cell phone for updates.
5. If you have a medical condition that will make evacuation a challenge, please inform me privately so we can plan an appropriate alternative and safe response.
6. Please take responsibility to assist others.

BIOH 405 - Hematology

Lecture and Lab Schedule - Fall 2014

			Required reading:
August	M	25 Lecture - Introduction, Overview, Safety	Chapters 1-2
	T	26 Lab - Safety in the Lab	Chapter 2, FacPac pg. 5-16
	W	27 Lecture - Quality Control, Quality Assurance, Phlebotomy	Chapters 3, 5
September	M	1 No Class - Labor Day	
	T	2 Lab - Blood Drawing, Microscopes	Chapters 3-4, FacPac pg. 17-37
	W	3 Lecture - Hematopoiesis, Cell Structure and Function	Chapter 7
	M	8 Lecture - Erythrocyte Production and Destruction	Chapter 8
	T	9 Lab - Manual RBC & WBC Counts	Chapter 14, FacPac pg. 39-48
	W	10 Lecture - Hemoglobin Metabolism	Chapter 10
	M	15 Lecture - Iron Metabolism & Metabolism of the Erythrocyte	Chapter 11
	T	16 Lab - Hgb, Hct, RBC indices, Reticulocytes	Chapter 14, FacPac pg. 49-70
	W	17 Lecture - Leukocyte Development, Kinetics & Functions Part 1	Chapter 12
	M	22 Lecture - Leukocyte Development, Kinetics & Functions Part 2	Chapter 12
	T	23 Lab - Blood Staining for Microscopic Analysis	Chapter 15, FacPac pg. 71-79
	W	24 LAB/LECTURE TEST #1	
	M	29 Lecture - Anemias: Introduction; Automated Instruments	Chapter 18, 39
	T	30 Lab - Evaluation of Stained Blood Smears	Chapter 15, FacPac pg. 81-92
	W	1 Lecture - Hematopathology: Iron Deficiencies	Chapter 19
October	M	6 Lecture - Hematopathology: Megaloblastic & Aplastic Anemias	Chapters 20-21
	T	7 Lab - WBC Differentials - Sedimentation Rate	Chapters 14-15, FacPac pg. 81-98
	W	8 Lecture - Hematopathology: Intrinsic Defects	Chapter 22
	M	13 Lecture - Hematopathology: Intrinsic Defects Continued	Chapter 23
	T	14 Lab - WBC Differentials - Practice Slides	Chapter 15, FacPac pg. 81-92
	W	15 Lecture - Hematopathology: Extrinsic Defects	Chapter 24, 25
	M	20 Lecture - Hematopathology: Hemoglobinopathies, Thalassemias	Chapters 26, 27
	T	21 Lab - Flow Cytometry	Chapter 33, FacPac pg. 99-104
	W	22 Review for Lab/Lecture test #2	
	M	27 LAB/LECTURE TEST #2	
	T	28 Lab - Hand Out Unknown Clinical Case Slides	Chapter 15, FacPac pg. 81-92
	W	29 Lecture - Leukocyte Disorders: Non-malignant Disorders	Chapter 28
November	M	3 Lecture - Leukocyte Disorders: Specialty Testing	Chapters 29-33
	T	4 No Lab - Election Day	
	W	5 Lecture - Leukocyte Disorders: Myeloproliferative Neoplasms	Chapter 34
	M	10 Lecture - Leukocyte Disorders: Acute Leukemias	Chapter 36
	T	11 No Lab - Veterans Day	
	W	12 Lecture - Leukocyte Disorders: Myelodysplastic Syndromes	Chapter 35
	M	17 Lecture - Leukocyte disorders: Mature Lymphoid Neoplasms	Chapters 37-38
	T	18 Lab - Work on Unknowns; LAB/LECTURE Test #3	
	W	19 Lecture - Normal Hemostasis & Coagulation	Chapter 40
	M	24 Lecture - Disorders of Hemostasis ; Unknown's Due	Chapters 41, 43, 44
	T	25 Lab - Review Unknowns; Review for Lab Final	
	W	26 No Class - Travel Day for Thanksgiving Holiday	
December	M	1 Lecture - Lab Tests for Hemostasis	Chapter 45
	T	2 Lab - LAB FINAL - slides and written SB 336 (note the room change)	
	W	3 Lecture - Body Fluids	Chapter 17
Decmeber	M	8 FINAL EXAM - 8:00 - 10:00 am, SB 025	