Med 530 Course C
Foundations of Medicine: Anatomy, Physiology, and Pathology
(4 units)

Master of Science in Global Medicine
Department of Medical Education Affairs
Keck School of Medicine
University of Southern California

Instructors: Dr. Jorge N. Artaza, Dr. Monica G. Ferrini

USC blackboard (BB): available at https://blackboard.usc.edu/
– The syllabus, announcements, lecture slides, online homework assignments, and grades will be posted on BB.

Required Textbooks:
_Anatomy and Physiology: Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn. Publisher: Pearson; ISBN: 0-8053-9591-1.

_PhysioEx 9.0 Laboratory Simulations in Physiology by P. Zao, T stabler et al. Publisher: Pearson ISBN-13: 978-0-321-81557-6.

Suggested Textbooks:
_General Pathology: Kumar V, Abbas AK, and Fausto N and Aster JC. Robbins and Cotran: Pathologic basis of Disease. Eighth Edition. Elsevier Saunders Company, 2010.

Course description

This course is a continuation of MEDS530B; it covers the basics of human anatomy (gross anatomy, histology), physiology (cellular physiology and different organ system areas) and pathology (general, systemic and cellular pathology). We will review the structure, function and diseases of the major organ systems of the human body, with an overview of disease prevention and laboratory simulation of case studies for every organ systems. The course is oriented to pre-medical and health professional related students.

Course Objectives

Upon completion of this course, students should be able to:
-Utilize the appropriate anatomical terminology when referring to the human body.
- Recognize anatomy, physiology, and pathophysiology of the blood, heart and circulatory system, immune and lymph system, digestive system, respiratory system, urinary, and reproductive systems, and deal with different case studies, and identify symptoms, required pre-tests, confirmatory tests, and pathological conditions for these systems, and explain the behavioral ways for disease prevention.
- Apply computer simulation to understand structure and functions of the organ systems covered in the course.
-Integrate information from current clinical literature with basic anatomical concepts and how they relate to the normal or disease state.

Course Structure

Lectures
Students are responsible for all topics and issues discussed in the lectures, even if they are not covered in the textbook. All lectures will be posted on blackboard at least one day before the lecture day.

Presentations assignments 20%

One or two oral presentations depending on the number of students of diseases will be assigned to each student at the beginning of the semester. Students will discuss signs and symptoms; other diseases that produce the same symptoms, risk factors, and diagnostic based on pre and post confirmatory tests, prevention method and therapeutic plan for that particular disease. Students can use different resources (Internet, literature, videos, etc.) to do the assignment.

Homework & Online Laboratories
Will account for **10%** of the final semester grade.
Each student is responsible for completion of his/her own assignment/s and submission by the assign due day and time. Late assignments will not be accepted.

Midterm exam and Final

– 1 in-class Midterm worth **35%**, and a final exam worth **35%** of your total grade.
– The Midterm and the Final will have 50 questions each, and the final will not be cumulative.

Grading System:

Grading Scale:	**B+:** 88-89%	**C+:** 78-79%	**D+:** 68-69%	**F:** <59%
A: 93-100%	**B:** 83-87%	**C:** 73-77%	**D:** 63-67%	
A-: 90-92%	**B-:** 80-82%	**C-:** 70-72%	**D-:** 60-62%	

Lectures Description:

Session 1: (5/22) The Blood (Terminology and Anatomy) Blood Characteristics and components, Erythrocytes, Leukocytes (WBCs), Platelets/Thrombocytes. Complete blood test (CBC/Hemogram), Blood film, Functions of Blood and different blood cells, Response to Injury and/or Infection. Haemostatic Process, Blood Transfusions, Blood Typing. General Erythrocytes, leukocytes and thrombocytes Disorders. Blood tests. Blood collection, hemocytometer, blood count, ESR, Hematocrit, and Hb conc. Blood Coagulation, Blood Groups.

Session 2: (5/26) Memorial Day (No class).

Session 3: (5/27) Red blood cells disorders: Anemias and Erythrocytosis I: Microcytic and hypochromic anemias: IDA (iron deficiency anemias), thalassemias, anemias of chronic diseases, sideroblastic anemias, sickle cell anemia. Methods of Diagnostics

Session 4: (5/29) Red blood cells disorders: Anemias and Erythrocytosis II: Normocytic anemias: aplastic anemia, hemolytic anemias: intra and extra-vascular, Macrocytic anemias: megaloblastic and non-megaloblastic anemias. Erythrocytosis and Polycytemias. Methods of Diagnostics. Clinical cases.

Session 5: (6/2) White Blood cells disorders: Benign leukocytes disorders: Leukopenias and leukocytosis: qualitative and quantitative disorders. Neutrophilias, Leukemoid reaction, eosinophilias, basophilias, monocytosis and lymphocytosis. Leukemias: definition, classification and diagnostic. Clinical cases.

Session 6: (6/3) Leukemias: definition, classification and diagnostic. Acute and chronic leukemias. Lymphoblastic and myeloid leukemias. Classification: FAB and WHO. Clinical cases.

Session 7: (6/5): Stem Cells & Regenerative Medicine. Adult, embryonic and iPS stem cells. Stem cells therapy.

Session 8: (6/9) Lymphatic System and immune system I: Anatomy and physiology)
Characteristics of Immunity, signs/symptoms of inflammation, lines of defense, Immunity, cell mediated and humoral immunity. Protein electrophoresis, Western blot

Session 9: (6/10) MIDTERM

Session 10: (6/12) Lymphatic System and Immune system II: Pathology. Lymphatic System, Spleen Disorders, Immune System disorders. Transplantation and immune system.
Autoimmune disease.

Session 11: (6/16) The Heart (Terminology Anatomy and Physiology) Anatomy The Heart, Layers of the Heart Wall & Pericardium, Chambers, Pathway the blood through the heart; coronary circulations; Microscopic Anatomy of Cardiac Muscle; Intercalated Discs, Cardiac Muscle Contraction; Heart Physiology: Conduction system in the heart; extrinsic; EKG, Heart sounds; cardiac cycle; cardiac output; Regulation of the stroke volume; Regulation of the heart rate. Reading: Chapter 18, Anatomy and Physiology: Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn

Session 12: (6/17) Blood Vessels & Blood Circulation (Terminology, Anatomy and Physiology) Anatomy of Arteries and Veins, types of blood vessels and capillaries; capillary exchange hemodynamics: factors affecting blood flow; Blood Pressure (BP); Peripheral Resistance; Heart, Major Arteries of Systemic and pulmonary Circulations, Arterial Supply of the Brain, Special Circulations (Circle of Willis, Hepatic portal circulation, Fetal circulation) Factors that Influence BP.
Reading: Chapter 19 Anatomy and Physiology: Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn.

Session 13: (6/19) Respiratory System I: Anatomy of Upper & Lower Respiratory Tracts. Major organs; voice production; conducting zone; respiratory zone, respiratory membrane; mechanics of breathing: inspiration and expiration; respiratory volumes and respiratory capacities; respiratory function test.
Reading: Chapter 22. Chapter 22 Anatomy and Physiology: Human Anatomy and Physiology 8th (2010) by Elaine Marieb & Katja Hoehn

Session 14: (6/23) Respiratory System II: Gas Exchanges Between Blood, Lungs, and Tissues. External and internal Respiration, Gas Transport to Tissue Cells, How RBCs and HB bind to oxygen, Other Factors Influencing Hemoglobin Saturation; Neural Regulation of Respiration, Factors Influencing the Rate & Depth of Breathing. Pulmonary Irritant and inflation reflexes; Respiratory Adjustments: Exercise Medical Terms for Altered Breathing (Eupnea, Hyperpnea, Hypopnea, Tachypnea, Apnea, Dyspnea, Orthopnea, Anoxia, Suffocation, Hypercapnia, Hypoxia/Hypoxemia)

Session 15: (6/24) Digestive System I: Anatomy and Histology of GI tract and layers, Peritoneum, mouth and oral cavity, teeth and tongue, esophagus, stomach, small intestine, and large intestine Physiology of defecation.
Reading: Chapter 23 Anatomy and Physiology: Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn.

Session 16: (6/26) Digestive System II & Metabolism: accessory digestive organs (salivary glands, liver, gallbladder, pancreas), bile; physiology of the digestive process: digestion and absorption of macromolecules; neural and hormonal control of digestion. Phases of digestion: cephalic, gastric and intestinal; liver function tests.
Metabolic adaptations: absorptive and postabsorptive state; metabolism during fasting and starvation; heat; metabolic rate; body temperature homeostasis; fever;
Reading: Chapter 23 and 24 Anatomy and Physiology: Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn

Session 17: (6/30) Students presentations.

Session 18: (7/1) FINAL

Students with Disabilities
Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be certain the letter is delivered to the instructor as early in the semester as possible. DSP is located in on the University Park campus in STU 301 and is open 8:30 a.m. – 5:00 p.m., Monday through Friday. The phone number is (213) 740-0776.

Statement on Academic Integrity
USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A:
http://www.usc.edu/dept/publicationis/SCAMPUS/gov/
Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there by a suspicious of academic dishonesty. The Review process can be found at http://www.usc.edu/student-affairs/SJACS/