

# Keck School of Medicine of **USC**

## Master of Science in Global Medicine Program

### **MEDS 530B**

### **Foundations of Medicine: Anatomy, Physiology, and Pathology (4 units)**

**Term:** Spring 2017  
**Day(s)/Time:** MW- 9:00 am - 10:50 AM

**Location:** Mckibben Hall 156

**Instructor:** Mansour Rostami M.D.  
**Office:** TBA  
**Office Hours:** By Appointment  
**Contact Info:** mrostami@usc.edu

### **Course description**

This course is a continuation of MEDS530A; 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, and urinary 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.
- 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 of diseases will be assigned to each student at the beginning of the semester depending on the number of students. Students will discuss the disease, its 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. **Questions about each of the presentations will be included in the final exam.**

## **Homework**

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 exams and Final**

2 in-class Midterms worth **40%** (20% each), and a final exam worth **30%** of your total grade.

Midterms will have 50 questions, and the final exam will have 100 questions

## **Required Readings and Supplementary Materials**

Textbook is required and can be downloaded from the link below. You are expected to come to class prepared to discuss the assigned reading for that day. During class, you are expected to be prepared to discuss important points from the readings, and to ask questions if there is something you do not understand from the readings or class discussions. Participation levels in class discussion are student-determined, but those expecting to excel in this course will take the time to both read and analyze the assigned reading material.

**Required Textbook:** Anatomy and Physiology: Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn. Publisher: Pearson; ISBN: 0-3217-4326-1; ISBN13: 978-0-321-74326-8.

**Link** to **Textbook:**  
<https://www.dropbox.com/sh/7qyinnjy3geka6w/AADkgsnl6WKxngKSMK9wblPwa/Marieb%20Human%20Anatomy%20%26%20Physiology%209th%20txtbk.pdf?dl=0>

**Link to PowerPoints:**

<https://www.dropbox.com/sh/7qyinnjy3geka6w/AAAaz8RF2tXXexMxyqKED2r2a/LAMC-%20El%20Camino%20Marieb's%20Anatomy/Anatomy%20Ed%2011%2C%20El%20Camino%20Marieb%202015?dl=0>

[https://www.dropbox.com/sh/7qyinnjy3geka6w/AACVeSe5xSR\\_1ec7lNFsOCPga?n=118697360](https://www.dropbox.com/sh/7qyinnjy3geka6w/AACVeSe5xSR_1ec7lNFsOCPga?n=118697360)

**Link to Sample Questions:**

<https://sites.google.com/site/doctorrostami/los-angeles-mission-college/anatomy-1/study-guide>

**Additional Resources:** A Medical Dictionary (e.g. Dorlund's Pocket Medical Dictionary)

**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.**

## Grading

Students will be assessed based on the following Grading Scale:

<b>Grading Scale:</b>	<b>B+: 87-89%</b>	<b>C+: 77-79%</b>	<b>D+: 68-69%</b>	<b>F: &lt;59%</b>
<b>A: 93-100%</b>	<b>B: 83-86%</b>	<b>C: 73-76%</b>	<b>D: 63-67%</b>	
<b>A-: 90-92%</b>	<b>B-: 80-82%</b>	<b>C-: 70-72%</b>	<b>D-: 60-62%</b>	

### Statement for 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 sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. Website and contact information for DSP: [http://sait.usc.edu/academicsupport/centerprograms/dsp/home\\_index.html](http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html), (213) 740-0776 (Phone), (213) 740-6948 (TDD only), (213) 740-8216 (FAX) [ability@usc.edu](mailto:ability@usc.edu).

### 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, ([www.usc.edu/scampus](http://www.usc.edu/scampus) or <http://scampus.usc.edu>) contains the University Student Conduct Code (see University Governance, Section 11.00), while the recommended sanctions are located in Appendix A.

## **Emergency Preparedness/Course Continuity in a Crisis**

In case of a declared emergency if travel to campus is not feasible, USC executive leadership will announce an electronic way for instructors to teach students in their residence halls or homes using a combination of Blackboard, teleconferencing, and other technologies.

## **Course Schedule: Weekly breakdown and lectures description**

### **Week 1:**

**Session 1: (1/9) 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.

**Session 2: (1/11) 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

### **Week 2:**

**Session 3: (1/16)** Martin Luther King's Birthday

**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, Factors that Influence BP.

**Reading:** Chapter 19 Anatomy and Physiology: Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn

**Session 4: (1/18) 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.

### **Week 3:**

**Session 5: (1/23) The Blood: (Physiology and Pathology)** 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 6: (1/25) Red blood cells disorders: Anemias and Erythrocytosis I:** Red blood cells disorders: classification and diagnostic of Anemias. Microcytic Anemias: IDA, sideroblastic anemias, Thalasemias.

#### **Week 4:**

**Session 7: (1/30) Red blood cells disorders: Anemias and Erythrocytosis II:** Normocytic anemias: aplastic anemia, hemolytic anemias: intra and extra-vascular, Macrocytic anemias: megaloblastic and nonmegaloblastic anemias. Erythrocytosis and Polycytemias.

**Session 8: (2/1) White Blood cells disorders I:** Benign leukocytes disorders: Leukopenias and leukocytosis: qualitative and quantitative disorders. Neutrophilias, Leukemoid reaction, eosinophilias, basophilias, monocytosis and lymphocytosis.

#### **Week 5:**

**Session 9: (2/6) Presentation Session: Blood and cardiovascular System Diseases.** Students will present a description of the symptoms, other diseases that produce the same symptoms, confounding symptoms and factors, risk factors, pre and post confirmatory tests, prevention method and therapeutic plan for that case.

**Reading:** Kumar V, Abbas AK, and Fausto N and Aster JC. Robbins and Cotran: Pathologic basis of Disease. Eighth Edition. Elsevier Saunders Company, 2010, chapter 11. Blood Vessels and chapter 12. The Heart.

**Session 10 (2/8):** **First Midterm.**

#### **Week 6:**

**Session 11 (2/13) President's Day**

**White Blood cells disorders II:** Malignant leukocyte disorders: Leukemias: definition, classification: FAB and WHO, incidence and diagnostic. Treatment. Lymphoid tumors. Multiple Myeloma. Revision and Clinical cases.

**Session 12: (2/15) Stem Cells & Regenerative Medicine.** Adult, embryonic and iPS stem cells. Stem cells therapy.

#### **Week 7:**

**Session 13: (2/20): Lymphatic System and immune system I:** (Terminology, Anatomy and physiology). Organs of the Immune System, The Lymphatic System, Lymphatic Capillaries, Functions of the Lymphatic system, Lymphatic Flow, Structure of a Lymph Node, Regional Lymph Node Groups, The Spleen structure and its functions, The Thymus, The Reticuloendothelial System.

**Session 14: (2/22) Lymphatic System and Immune system II :**(Anatomy and physiology)  
Characteristics of Immunity, signs/symptoms of inflammation, lines of defense, Immunity, cell mediated and humoral immunity. Protein electrophoresis, Western blot

## **Week 8:**

**Session 15 (2/27): Lymphatic System and immune system III** :(Pathology) Lymphatic System, Spleen Disorders, Immune System disorders. Autoimmune disease.

**Reading:** Kumar V, Abbas AK, and Fausto N and Aster JC. Robbins and Cotran: Pathologic basis of Disease. Eighth Edition. Elsevier Saunders Company, 2010, chapter 13. Diseases of Lymph Nodes, Spleen and Thymus.

**Session 16: (3/1) Lymphatic System and immune system IV** Transplantation and immune system. Manipulation of the Immune response. Anti-inflammatory, cytotoxic and non-cytotoxic fungal and bacterial derivative drugs mechanisms of action. Biological Agents Can be used to Alleviate and Suppress Autoimmune Diseases

## **Week 9:**

**Session 17: (3/6). Presentation Session: Immune System Diseases.** Students will present a description of the symptoms, other diseases that produce the same symptoms, confounding symptoms and factors, risk factors, pre and post confirmatory tests, prevention method and therapeutic plan for that case.

**Reading:** Kumar V, Abbas AK, and Fausto N and Aster JC. Robbins and Cotran: Pathologic basis of Disease. Eighth Edition. Elsevier Saunders Company, 2010, chapter 11. Blood Vessels and chapter 12. The Heart.

**Session 18: (3/8)**

**Second Midterm**

**Week 10: Spring Recess 3/12-3/19**

## **Week 11:**

**Session 19: (3/20) 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 9th (2013) by Elaine Marieb & Katja Hoehn

**Session 20: (3/22) 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)

**Reading:** Chapter 22 Anatomy and Physiology: Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn

## Week 12:

**Session 21: (3/27) Presentation Session Respiratory Systems diseases** Students will present a description of the symptoms, other diseases that produce the same symptoms, confounding symptoms and factors, risk factors, pre and post confirmatory tests, prevention method and therapeutic plan for that case.

**Session 16: (3/29) 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

## Week 13:

**Session 17: (4/3) Digestive System II:** 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.

**Reading:** Chapter 23 Anatomy and Physiology: Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn

**Session 18: (4/5) Metabolism and nutrition:** metabolic adaptations: absorptive and postabsorptive state; metabolism during fasting and starvation; heat; metabolic rate; body temperature homeostasis; fever; energy homeostasis and regulation of food intake: nutrition: requirements for carbohydrates, protein and lipids; lipoproteins.

**Reading:** Chapter 24 Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn

## Week 14:

**Session 19: (4/10) Presentation Session Digestive Diseases and Nutrition.** Students will present a description of the symptoms, other diseases that produce the same symptoms, confounding symptoms and factors, risk factors, pre and post confirmatory tests, prevention method and therapeutic plan for that case.

**Session 20: (4/12) Urinary System I:** Overview of urinary system structure. kidney, nephron, glomerulus, renal capillaries, renal tubule, urinary bladder. **Reading:** Chapter 25 Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn

### **Week 15:**

**Session 21: (4/17) Urinary System II:** Renal physiology: glomerular filtration, tubular reabsorption; tubular secretion; formation of diluted and concentrated urine, hormonal and neural control, renal tests; characteristics of urine, urine constituents, urinalysis.

Reading: Chapter 25 Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn

**Session 21: (4/19) Urinary System II:** Renal physiology: glomerular filtration, tubular reabsorption; tubular secretion; formation of diluted and concentrated urine, hormonal and neural control, renal tests; characteristics of urine, urine constituents, urinalysis.

Reading: Chapter 25 Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn

### **Week 16:**

**Session 22: (4/24) Fluid, Electrolyte and Acid-Base Homeostasis:** composition of body fluids; regulation of water and solute loss; electrolytes balance; acid base balance; body buffer systems; acid-base imbalance; diagnostic.

Reading: Chapter 26 Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn

**Session 22: (4/26) Fluid, Electrolyte and Acid-Base Homeostasis:** composition of body fluids; regulation of water and solute loss; electrolytes balance; acid base balance; body buffer systems; acid-base imbalance; diagnostic.

Reading: Chapter 26 Human Anatomy and Physiology 9th (2013) by Elaine Marieb & Katja Hoehn

### **Week.17**

**Study Days Sat-Tue April 29-May 2**

**Final 5/3**