

PHOL 480: Translational System Physiology

Spring Semester 2013: M, W 8:00-9:30, Th 8.00-9.00

(4 credits course)

Course Director: *Andrea Romani*

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Required Text: "Medical Physiology" by WF Boron and EL Boulpaep, Elsevier Science, 2007, 2nd ed..

The course is arranged on a series of self-learned classes covering classical human physiology plus translational topics. Class time will be spent in active discussion of the assigned readings. There will be no lectures. Students will be given a set of learning objectives prior to each class meeting, and they are expected to master the material thoroughly before class. The students will discuss the reading assignment and learning objectives with the instructor in class. The instructor will facilitate the discussion, ask questions, and give clarification when needed. Class participation and discussion are integral parts of the course. The Thursday Class will be run in conjunction with a clinician (when possible) and will cover key physio-pathological or pathological conditions pertinent to the topics discuss in class during that week. Whenever possible, topics for the Thursday class may be proposed by the students.

Each of the 2 exams will consist of ~10-12 questions that will emphasize conceptual understanding of the material covered in class.

Grading: Exam I 30%
 Exam II 30%
 Participation in Discussion 40%

Class Schedule – Spring 2013

<u>Date</u>	<u>Topic</u>	<u>Instructor/Reading Assignment</u>
Introduction		
1/14	Introduction to the course	Romani
<u>Neurophysiology (Dr. Wilson)</u>		
1/14	Nervous System Overview	Wilson (267-274, 282-288)
1/16	Neurons, Synaptic Transmission	Wilson (310-322, 323-330)
1/17	<i>Paraplegia or Alzheimer</i>	
1/23	Sensory System, Autonomic nervous system	Wilson (351-370, 371-392)
1/24	CNS circuits, Motor System	Wilson (408-423)
Muscle Physiology (Dr. Nosek)		
1/28	Structure and Function of Muscle – part I	Nosek (237-263)
1/30	Structure and Function of Muscle – part II	Nosek (237-263)
1/31	<i>Myasthenia gravis or Sarcopenia</i>	
<u>Cardiovascular Physiology (Drs. Romani & Chandler)</u>		
2/4	Circulation, Cardiac Cycle	Romani (529-553)
2/6	Electrophysiology, Cardiac Function	Romani (504-528, 544-553)
2/7	<i>Hypertension or Hemorrhage</i>	
2/11	Regulation of Pressure & flow	Romani (429-439, 467-481)
2/13	Control of Cardiovascular Function	Chandler (554-576)
2/14	<i>Cardiac Hypertrophy or Fibrillation</i>	

Respiration Physiology (Dr. Boron)

2/18	Organization & Mechanics of Ventilation	Boron (613-651)
2/20	Acid/base regulation	Boron (652-670)
2/21	Gas Transport and Diffusion	Boron (672-684)
2/25	Gas Exchange: Ventilation and Diffusion	Boron (685-724)
2/27	Control of Breathing	Boron (725-745)

3/4 [Open for revision](#)

3/7 EXAM – part I

Gastro-Intestinal Physiology (Dr. Cotton)

3/11	Overview, Organization, motility	Cotton (883-894)
3/13	Gastric Function, pancreas and bile function	Cotton (895-927)
3/14	<i>Pancreatitis or Chron's Disease</i>	
3/18	Digestion and Absorption	Cotton (933-937, 949-957, 959-968)
3/20	Liver Physiology	Romani (TBD)
3/21	<i>Alcoholic Liver Disease</i>	

Renal Physiology (Dr. Simonson)

3/25	Urinary system, Glomerular Filtration	Simonson (749-760, 762-781)
3/27	Tubular Function/transport - part 1 (Na+)	Simonson (782-796)
3/28	<i>Renal Insufficiency or Tubulopathies</i>	
4/1	Tubular transport part 2 (Mg ²⁺ , Ca ²⁺ , glucose)	Simonson (797-834)
4/3	Tubular transport part 3 (K ⁺ , acid/base)	Simonson (851-880)
4/4	<i>Glomerulonephritis or Idiopathic Hypertension</i>	

Endocrine Physiology/Metabolism (Dr. Romani)

4/8	Overview: Endocrine System and Hypophysis	Romani (1011-1027)
4/10	Bone Mineral Metabolism	Romani (1094-1110)
4/11	<i>PI metabolism and Regulation</i>	
4/15	Thyroid	Romani (1044-1056)
4/17	Adrenal Glands (Mineral-Corticoids, etc)	Romani (1057-1073)
4/18	<i>Cushing</i>	
4/22	Growth Hormone	Romani (1028-1043)
4/24	Endocrine Pancreas and Metabolism	Romani (1074-1093)
4/25	<i>DIABETES</i>	

Integrative Physiology (Dr. Romani)

4/29	Nutrition; Fast vs. Fed	Romani (1000-1007; 1213-1236)
5/01	Exercise and Adaptive Responses	Romani (593-609, 1249-1267)
5/02	Aging and Adaptive Responses	Romani

5/6 EXAM – part II

5/11 **FINAL GRADES ARE DUE**

Instructors and e-mails for Phol 480 (in alphabetic order)

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Chandler Margareth: mpc10@case.edu

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Nosek Tom: tmn2@case.edu

Romani Andrea: amr5@po.cwru.edu

Simonson: mss5@case.edu

Wilson Chris: cgwilson@case.edu

Protein Nutrition, Exercise and aging

Romani (1281-1292) plus review

11-beta-HSD