FALL 2013
SYSTEMS PHYSIOLOGY III- APPH 6213
Integrated Systems and Adaptation

Course Director: Ed Balog, PhD
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Class schedule: T, Th 12:05-1:25
Location: 555 14th St Room 1103

Pre-requisite: APPH 6211, 6212 (Systems Physiology I, II)

Course description: The course will focus on integrative mechanisms of organ systems involved in homeostasis and function of the intact organism (e.g. human physiology). Particular emphasis will be placed on the interaction among various organ systems (e.g. cardiorespiratory, neuroendocrine, urinary), their biological adaptation and plasticity related to pathology, stress, and exercise.

Required Textbook: W.F. Boron and E.L. Boulpaep, Medical Physiology, 2nd Undated Edition, 2012 Elsevier Press
ISBN: 978-1-4377-1753-2

Course Evaluation:		
	Mid term exam	25%
	Final cumulative exam	45%
	Student teaching presentation	10%
	Critique of Journal article	20%

Journal Article Critique
The goals of journal article critique are to foster critical analysis of the scientific literature and promote effective written communication. The paper should be 7-10 double spaced pages including references. Students will chose an original research article from a reputable peer-reviewed journal and get approval for the paper from instructors. The topic of the journal article should be broadly related to an area covered in class. The critique should begin with a brief review of the literature leading to the reason why the work described in the article was performed and the hypothesis. The review of the literature will require that you read articles in addition to the one you will analyze. Included these articles in your references. The critique should also include a summary of the methods, results and the author's interpretation and conclusion. Your critique should include a discussion of whether the problem was significant, were the experimental design and methods appropriate, do you agree with the author's interpretation of the results, is the work likely to have a significant impact on the field, what (if anything) would you have done differently and what should be done next.

Student teaching presentation
The goal of the teaching presentation is to foster effective verbal communication. Students will teach one of the lecture topics listed below. Students will be assessed on both the factual information provided and the clarity of the presentation.

Course Faculty:
Patricia J. Nichols Assistant Professor, Division of Physical Therapy, Emory University.
pnichol@emory.edu

Ed Balog Associate Professor, School of Applied Physiology, Georgia Tech.
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Lecture Schedule (30 in-class meetings) Assigned Reading

Unit I	CONTROL OF PHYSIOLOGICAL PROCESSES		
Tues., Aug. 20	Principles of Regulation and Homeostasis	P. Nichols	Chpt 1
Thurs Aug 22	Control of metabolism	P. Nichols	Chpt 51
Tues Aug 27	Implications of Endocrine pathology (DIABETES mellitus) Disturbances of homeostasis in DKA	P. Nichols	Chpt 51
Thurs Aug 29	Principles of Endocrine Physiology	E. Balog	Chpt 47
Tues Sept 3	Endocrine regulation of growth & the Thyroid	E. Balog	Chpts 48-49
Thurs Sept 5	Hypothalmic-Pituitary-Gonadal Axis	E. Balog	Chpts 54-55
Tues Sept 10	Student Lessons: Adrenal gland influences	E. Balog	Chpt 50

UNIT II	CARDIOVASCULAR PHYSIOLOGY		
Thurs Sept 12	Cardiovascular physiology: Overview	P. Nichols	Chpts. 17,19
Tues Sept 17	Cardiovascular: the heart as a pump	P. Nichols	Chpts. 21-22
Thurs Sept 19	Cardiovascular: the peripheral circulation	P. Nichols	Chpts. 19,20,24
Tues., Sept. 24	Control of cardiac output and blood pressure	P. Nichols	Chpts. 23,25
Thurs., Sept. 26	Control of cardiac output and blood pressure	P. Nichols	Chpts. 23,25
Tues., Oct. 1	Respiratory physiology: Overview/ventilation	P. Nichols	Chpts. 26,27

UNIT III PULMONARY PHYSIOLOGY			
Thurs., Oct. 3	Respiratory: Carriage of gases	P. Nichols	Chpt. 29
Tues., Oct. 8	Respiratory: Work of ventilation Gas Exchange	P. Nichols	Chpts. 30,31
Thurs., Oct. 10	**Midterm (Unit 1 and II)**		
Tues., Oct 15	**Fall Break**		
Thurs Oct 17	Respiratory: control of ventilation	P. Nichols	Chpts. 31,32
Tues., Oct. 22	**Hypoxia** **Interpretation of arterial blood gases**	**P. Nichols**	**Chpt 31**

Deadline for approval of paper topics, e-mail copy of paper to Dr Balog.

Thurs., Oct. 24	Blood	E. Balog	Chpt 18, p. 1258-1260
UNIT IV RENAL PHYSIOLOGY			
Tues., Oct 29	Renal System: Overview / Clearance	P. Nichols	Chpt. 33
Thurs., Oct 31	Filtration and tubular function	P. Nichols	Chpts. 34-37
Tues., Nov. 5	Control of ECF osmolarity	P. Nichols	Chpt. 38
Thurs., Nov. 7	Control of blood volume and blood pressure	P Nichols	Chpt 40
Tues., Nov. 12	Acid Base Balance : respiratory and renal	P. Nichols	Chpts.28,39 PJN Away
Thurs., Nov. 14	Acid base/ renal failure	P. Nichols	
UNIT V	THE CONTROL OF IMMUNE FUNCTION		
Tues, Nov. 19	Immune ***Paper Critiques Due***	Nichols	
Thurs., Nov. 21	I*mmune*	Nichols	
Tues., Nov. 26	Immune perturbations: exercise, stress, disease	Nichols	
Thurs., Nov 28	Thanksgiving		
UNIT VI	Further integrative function		
Tues., Dec. 3	Fluid/Thermoregulatory balance Electrolyte balance	E. Balog E Balog	Chpt 59, p 1260-1264 Chpts. 35-37, 52
Thurs., Dec. 5	Electrolyte balance	E Balog	Chpts. 35-37, 52

FINAL EXAM DECEMBER 10 11:30-2:20