Advances in Hypertension Research
Course Syllabus

Course Number: **GMS 6413**

Credit Hours: **2 credit hours**

Course Format: **This online course is tailored for asynchronous distance learners.**

COURSE DESCRIPTION
This is an advanced graduate class, also suitable for postdoctoral students which will expose students to important, current aspects of Hypertension research. It begins with clinical trials and pharmacogenomics; considers mono- and polygenic forms of hypertension; dietary/environmental influences leading to salt dependent hypertension / metabolic syndrome/ type 2 diabetes; neural control of BP and stress-induced hypertension; endothelial dysfunction / inflammation and stem cells in hypertension and concludes with hypertension in pregnancy and fetal programming of hypertension. The teaching faculty is drawn from a wide range of disciplines and are all actively involved in research on their areas of expertise. The structure of this course involves 1). Lectures by research faculty on areas of their expertise and 2). Tutorial style discussions on original articles which expand on the didactic lecture material.

TARGET AUDIENCE
This course is designed for individuals wishing for an in-depth understanding of the current state of hypertension research. This course will be useful for students who have not met the entry requirements for medical school and who are interested in a career in Cardiovascular and/or Nephrology Medicine; for those wishing to enhance their applications into Masters and PhD programs in the medical sciences in cardiovascular / renal research.

PREREQUISITES
This course requires a BA or BS and a strong science foundation with at least 5 full semester courses related to biology, chemistry and/or physics. In addition, Principles of Medical Physiology (GMS6400c) is required.

CONTACTS
The course coordinator is Chris Baylis Ph.D., Professor of Physiology and Medicine and Director of the UF Hypertension Center. Contact: baylisc@ufl.edu

SCHEDULE

This is a half semester long course that is offered during the 1st part of the summer and Fall semesters. It is designed to be taken as part of the Medical Physiology Certificate course and should be preceded by GMS 6400C, GMS 6410 and GMS 6414.

COURSE GOALS

Hypertension is a multifactorial disease and this course explores: 1). Some of the current treatments available. 2). How cardiovascular, neural, endocrine and renal function all influence blood pressure control. 3). How vascular endothelial dysfunction / inflammation are associated with hypertension. 4). How genetic, epigenetic and environmental factors can determine the level of the blood pressure. 5). The complexity of the factors that lead to hypertension.

LEARNING OUTCOMES

Upon completion of this course, students will be able to:

1. Understand how many individual body systems cooperate in the control of the normal blood pressure.
2. Understand how impairments in cardiovascular, neural, endocrine and /or renal function can lead to hypertension.
3. Understand why the majority of hypertension is classed as “essential” or of unknown origin.
4. Understand the role of genetic, epigenetic and environmental factors in the development of hypertension.
5. Develop an in depth understanding of some of the research contributions that are shaping our current views on high blood pressure causes and consequences.
6. Present individual research papers in a critical manner and in the context of the material already discussed

LEARNING RESOURCES

1. Recorded lectures with PowerPoint presentations, workshops and virtual laboratory exercises will be provided on the course website.
2. Tutorial (informal) discussions of research articles will be available EITHER as an online discussion using bulletin board and discussion website, or in real time using webcam. The real time sessions will also be recorded and posted online.
3. Online Q/A bulletin board and discussion website where students can post questions, which faculty will answer within the bulletin board.
4. There is no textbook for this course. Lectures will be accompanied by notes in PowerPoint format. References for original articles will be provided which students can access through the PUBMED using the University of Florida log-on.

EXAMINATIONS AND GRADING

A numerical grade will be given at the end of the module and will represent an average between the grades of all participating faculty. The assessment will be 25% on each of 2 sessions (mid-term and final) in which each student presents one specific paper that

is related to the material that has been discussed. A final, open book written examination will be worth the remaining 50%.
The grade will be scored as follows:

Grading scale:

A numerical grade will be given at the end of the course and will be scored as follows:

93-100% = A
90-92%= A-
87-89% = B+
83-86% = B
80-82% = B-
77-79% = C+
73-76% = C
70-72% = C-
67-69% = D+
63-66% = D
<63% =E

GRADING POLICY
Failure to attend the live tutorial discussions and paper presentations will receive a 0 for that class. In some circumstances where an absence is essential this will be waived, but the student must obtain the prior approval of the instructor.

ACADEMIC HONESTY
Please review the complete policy of the University of Florida regarding academic dishonesty, found in the online student handbook at:
http://www.dso.ufl.edu/judicial/pdffiles/handbook 2003.pdf

Students are expected to abide by the University of Florida Academic Honesty Guidelines and to adhere to the following pledge:

"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied:
"On my honor, I have neither given nor received unauthorized aid in doing this assignment."

Course Schedule:

Date/ time	Subject	Teacher
Week 1	Introduction.	Baylis
	Lecture: Clinical trials for therapy.	DeHoff
	Lecture: Pharmacogenomics and Hypertension.	Gong
	Tutorial discussions on clinical trials and Pharmacogenomics	Faculty
Week 2	Lecture: Single gene polymorphisms and Hypertension.	Wingo
	Lecture: Populations and HT	Segal
	Tutorials on monogenic causes of hypertension and hypertension in different populations	Faculty
	Lecture: The kidney in Hypertension	Baylis
Week 3	Lecture: Salt dependent HT.	Weiner
	Lecture: Metabolic Syndrome and Diabetes - How These Affect Hypertension Management.	De-Hoff
	Tutorials on the kidney in hypertension and Salt dependent hypertension and metabolic syndrome.	Faculty
Week 4	**Student presentations on assigned papers**	Faculty
	Lecture: Neural control of BP/ stress induced Hypertension	Scheuer
Week 5	Lecture: Oxidative stress, inflammation and Hypertension	Raizada/ Sumners
	Lecture: Endothelial dysfunction in Hypertension	Delp
	Tutorials on stress and Hypertension; oxidative stress, inflammation and Hypertension and endothelial dysfunction	Faculty
	Lecture: Stem cells in hypertension.	Segal
Week 6	Lecture: Hypertension in pregnancy	Conrad
	Lecture: Fetal programming of Hypertension	Keller- Wood/ Wood.
	Tutorial discussions on Stem cells in cells in hypertension; pregnancy and hypertension and fetal programming of hypertension	Faculty
Week 7	**Student presentations on assigned papers**	Faculty
	Open book exam	

Please note that this is an advanced, up to date, research based course and the content will vary according to recent advances.