

Physiology of Circulation of Blood

Course Syllabus

Course Number: GMS 6410

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 in depth discussion and understanding of several aspects of cardiovascular function, as follows: Control of cardiac development; vascular and microvascular function; baroreflex and chemoreflex control of the circulation; role of the kidney and central nervous systems in cardiovascular regulation; the maternal and fetal circulation in normal pregnancy; use of gene therapy tools in cardiovascular research. 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 current views on cardiovascular physiology. 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 medicine; for those wishing to enhance their applications into Masters and PhD programs in the medical sciences in cardiovascular 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) are required.

CONTACTS

The course coordinator is Peter Sayeski Ph.D., Professor of Physiology and Functional Genomics. psayeski@ufl.edu

SCHEDULE

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

COURSE GOALS

The cardiovascular system provides supplies the vital organs with blood and is under complex control. This course explores: 1). How the heart develops 2). Heterogeneity of structure and function in the vasculature. 3). The baroreflex and chemoreflex control of the circulation 4). How the kidney and the brain both exert long term influence on cardiovascular function. 5). The maternal and fetal cardiovascular adaptations during a normal pregnancy. 6). Use of gene therapy in cardiovascular research.

LEARNING OUTCOMES

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

1. Understand the normal molecular mechanisms controlling cardiac development.
2. Understand the structure, function and regulation of the various levels of vasculature and microvasculature.
3. Understand both baroreflex and chemoreflex control of cardiovascular functions.
4. Understand the long term control of the circulation by the kidney and the brain.
5. Understand the physiological adaptations of maternal and fetal cardiovascular systems during normal pregnancy.
6. Appreciate the use of gene therapy techniques in cardiovascular research.
7. Develop an in depth understanding of some of the research contributions that are shaping our current views on cardiovascular physiology.
8. 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%.

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/pdf/files/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."

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Course Schedule

Date/time	Subject	Lecturer
Week 1	Introduction to the class Lecture: CNS Pathways	Sayeski Hayward
	Discussion: CNS Pathways Lecture: Chemoreflex	Hayward Wood
Week 2	Discussion: Chemoreflex Lecture: Fetal Circulation	Wood Wood
	Discussion: Fetal Circulation Lecture: Cardiovascular roles for tyrosine kinase.	Wood Sayeski
Week 3	Discussion: Cardiovascular roles for tyrosine kinase. Lecture: Gene Therapy tools	Sayeski Raizada
	Discussion: Gene Therapy tools Lecture: Vascular Function	Raizada Delp
Week 4	Midterm Paper presentation	Faculty
	Discussion: Vascular Function Lecture: Baroreflex	Delp Scheuer
Week 5	Discussion: Baroreflex Lecture: Baroreflex in Pregnancy	Scheuer Keller-Wood
	Discussion: Baroreflex in Pregnancy Lecture: Long Term Control of BP; the Kidney	Keller-Wood Baylis
Week 6	Discussion: Long Term Control of BP; the kidney Lecture: Cardiac Development	Baylis Kasahara
	Discussion: Cardiac Development	Kasahara
Week 7	Final Paper presentation	Faculty
	Open Book final exam	

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