Medical Pulmonary Physiology
Course Syllabus

Course Number: **GMS 6402**

Credit Hours: 3 credit hours

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

COURSE DESCRIPTION
Medical Respiration Physiology (GMS6402) teaches the functions of the pulmonary system of human body at a level required for clinical medicine and basic research in medical physiology. The course covers normal physiology, as well as selected diseases. Concepts are taught using a combination of lectures, online Research Assignments, and online problem sets. The Research Assignments are designed to help the student understand the integration of pulmonary physiology with genetics, genomics, molecular biology, and cellular physiology as a basis for a better understanding of human disease. The ultimate goal is for students to develop an understanding of the integrated functions of the normal body and "problem solving" and "critical thinking" skills in evaluating clinical situations. Each recorded lecture lasts between 20 and 30 min.

TARGET AUDIENCE
This course is designed to meet the needs of individuals wanting to pursue a career in medicine, biomedical research, or in teaching topics related to physiology and medicine. For example, this course is designed to provide critical knowledge for individuals who wish to teach pulmonary physiology at the secondary and post-secondary levels. However, this course will also provide a foundation for students who are wishing to attain or enhance knowledge of medical pulmonary physiology.

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. A minimum undergraduate GPA = 2.0 is required for admission. Co-enrollment or prior passing grade in GMS 6440 required for enrollment in this class.

CONTACTS
Peter Sayeski, Ph.D., Professor, Department of Physiology and Functional Genomics. Please use the email function within Canvas to contact Dr. Sayeski.

SCHEDULE
This is a self-paced course that is offered in the spring, fall and summer.

COURSE GOALS
Physiology is the science of how the body functions, and is the basis for understanding modern clinical medicine and the biomedical sciences. This course will provide: 1) a foundation understanding of the basic functions of the pulmonary system; 2) integration of individual facts in order to understand how organ systems work independently and interdependently in the body. One example of this integration is in the

understanding of emphysema. Other examples covered in this course include high altitude physiology and pulmonary adaptations to exercise.

LEARNING OUTCOMES

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

1. Understand the structure and normal functions of the lung at a level required for an understanding of clinical medicine.
2. Understand the uptake, transport, and utilization of oxygen and other blood gases at a level required for an understanding of clinical medicine.
3. Understand acid-base physiology at a level required for an understanding of clinical medicine.
4. Understand the mechanisms controlling pulmonary function at a level required for an understanding of clinical medicine.
5. Understand how these systems act in an integrated manner to regulate overall body functions.
6. Understand how failure of these normal physiologic functions and integrations are associated with some diseases.
7. Demonstrate the ability to apply physiological principles of clinical and basic science relevancy by multiple choice examinations, research assignments, and problem sets.

LEARNING RESOURCES

1. Recorded video lectures with PowerPoint presentations will be provided on the course website.
2. Recorded video clinical correlation(s) and/or case studies relating to the basic science material.
3. Lecture notes for each video lecture are available as PDF downloads enabled for direct note taking.
4. Text: Students may wish to supplement the course videos and PDF handout by purchasing an online version of "*Berne & Levy Physiology, 7th Edition*" 2018. Author: Bruce M. Koeppen & Bruce A. Stanton. ISBN: 9780323393942.

COMMUNICATION WITH FACULTY

If you have questions about the material or the course, please contact the course director (Dr. Sayeski) using the email function in Canvas.

STRUCTURE OF CONTENT

The course content is structured into sub-topical groups of lectures that are accompanied by Problem Sets. Problem Sets are designed to help the student master the course material. These problem sets are completed as take-home assignments and are graded. There are three Functional Genomics Research Assignments, which are designed to help the student integrate the concepts of physiology with functional genomics and human diseases of genetic origin. These Research Assignments are also completed as take-home assignments and are graded.

COURSE CALENDAR and RECOMMENDED TIME MANAGEMENT

The videos and corresponding PDF notes are available throughout the entire time the course is open, from the first day through the end of the course on the day the grades are reported to the Registrar. However, the Exam is open ONLY during the window of time shown on the website. The course content lecture titles should be viewed in the order shown later in this syllabus.

EXAMINATION AND GRADING

There will be one multiple choice examination covering the material taught in the lectures. The exam will be monitored by ProctorU, a UF chosen service that allows the students to complete their exams at home while still ensuring academic integrity. Students will take the exam at a computer that meets the technical requirements of ProctorU, including a web cam and microphone. Students will make the arrangements for exam proctoring. The exam may be taken any time during the window of availability; however, it can only be taken once.

We recommend you make an appointment with ProctorU at least two weeks in advance of your preferred exam date. All costs of the exam are covered in the registration costs. Scores are reported as a percent. The points used to compute final grades will be determined after all assignments and the exam have been completed.

GRADING SCALE:

A numerical grade will be given at the end of the course and will be scored as follows, per University of Florida standards:

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

The final examination accounts for 40% of the total grade, Functional Genomics Research Assignments 30% of the total grade, and Problem Sets 30% of the total grade.

GRADING POLICY

There are no make-up exams unless otherwise granted by the course coordinator prior to an examination date. Failure to take an exam without prior permission from the course coordinator will be recorded as 0.

ACADEMIC HONESTY
Please review the complete policy of the University of Florida regarding academic dishonesty, found in the online student handbook at: http://graduateschool.ufl.edu/media/graduate-school/pdf-files/handbook.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."

IMPORTANT NOTICE ABOUT PLAGIARISM
Plagiarism is not tolerated at the University of Florida. Plagiarism may be punishable by expulsion from the course or the certificate program. If plagiarism is detected after the certificate has been awarded, the certificate may be rescinded.

The University of Florida has an honor code that defines plagiarism as follows:

> Section 3a: Plagiarism.
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> A student shall not represent as the student's own work all or any portion of the work of another. Plagiarism includes but is not limited to:
>
> 1. Quoting oral or written materials including but not limited to those found on the internet, whether published or unpublished, without proper attribution.
> 2. Submitting a document or assignment which in whole or in part is identical or substantially identical to a document or assignment not authored by the student.
>
> Please note that intent is not an element of this kind of violation so it is important to take great care to complete the written assignments in your own words.
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> For a complete description of the UF Honor Code and procedures, please visit: https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/
>
> For a good discussion about plagiarism and how to properly cite your sources, please visit: http://mediasite.video.ufl.edu/Mediasite/Play/adaa44500eaf460a84f238e6b9a558f9

COURSE EVALUATION POLICY
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

MEDICAL PULMONARY PHYSIOLOGY (3 credit hours)

Lecture 1: Introduction to Respiratory Physiology
Lecture 2: Functional Anatomy
Lecture 3: The Respiratory Pump and Lung Volumes
Problem Set 1: Lung Structure

Lecture 4: Lung Compliance I
Lecture 5: Lung Compliance II
Lecture 6: Airway Resistance I
Lecture 7: Airway Resistance II
Problem Set 2: Pulmonary Mechanics.

Lecture 8: The Work of Breathing I
Lecture 9: The Work of Breathing II

Functional Genomics Research Assignment 1: Cystic Fibrosis

Lecture 10: Alveolar Ventilation and Gas Composition I
Lecture 11: Alveolar Ventilation and Gas Composition II
Problem Set 3: Alveolar Ventilation and Gas Composition

Lecture 12: Gas Diffusion I
Lecture 13: Gas Diffusion II
Problem Set 4: Gas Diffusion

Lecture 14: Oxygen Transport I
Lecture 15: Oxygen Transport II
Lecture 16: Oxygen Content I
Lecture 17: Oxygen Content II
Lecture 18: Clinical Correlation O_2 and CO_2 Assessment I
Lecture 19: Clinical Correlation O_2 and CO_2 Assessment II
Problem Set 5: Oxygen Transport and Carriage

Functional Genomics Research Assignment 2: Sickle Cell Anemia

Lecture 20: Pulmonary Circulation I
Lecture 21: Pulmonary Circulation II
Lecture 22: Clinical Correlation: Pulmonary Edema I
Lecture 23: Clinical Correlation: Pulmonary Edema II
Problem Set 6: Pulmonary Circulation

Lecture 24: Acid-Base I
Lecture 25: Acid-Base II
Problem Set 7: Acid-Base

Lecture 26: Respiratory Control I
Lecture 27: Respiratory Control II
Problem Set 8: Neural Respiratory Control Mechanisms

Lecture 28: High Altitude Respiration
Lecture 29: Clinical Correlation: Case Studies I
Lecture 30: Clinical Correlation: Case Studies II
Problem Set 9: Vascular Control Mechanisms

Lecture 31: Exercise Physiology and the Lung

Functional Genomics Research Assignment 3: Polycythemia Vera and Blood Doping

Final Examination