

SYLLABUS - PHYSIOLOGY OF AGING, FALL 2017
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Prerequisites: This course requires a basic knowledge of cell biology.

Textbook (NOT REQUIRED): Physiological Basis of Aging and Geriatrics, 4th Edition, by Paola S. Timiras (My copy of the 3rd Edition of this text will be available on reserve at SWEM.)

Goals: To provide a basic knowledge of the physiological processes associated with aging including common pathologies. To provide an introduction to the basic scientific literature in aging and basic instruction in how to read and present a scientific research paper.

Grading:

Research Paper Discussions	100 pts.	Weekly (10 total, 10 pts. each)
Test #1	30 pts.	Sept. 25
Test #2	30 pts.	Oct. 25
Test #3	30 pts.	Nov. 29
Final Exam (Comprehensive)	<u>30 pts.</u>	Dec. 19, 2:00-5:00 (tentative)
TOTAL	220 pts.	

Final grading is on the standard scale. However, if the mean is <80%, grading is on the curve, with the mean representing the lowest B.

Tests:

Tests will be multiple-choice. However, there is the opportunity to explain any answers you choose. If a wrong answer is chosen, a logical, valid explanation can sometimes lead to partial or even full credit. If the correct answer is chosen, there will be no deductions for invalid explanations.

If an alternate date is needed for tests due to scheduling conflicts, an earlier test date will be allowed if arranged at least one week prior with the professor. If a later date is needed due to illness or personal crisis (contact the Dean of Students), the test can be taken within one week after the test without penalty. Without an excuse, a late test will be allowed, but **5% will be deducted if taken within one week after the test, and 10% will be deducted if taken later than one week after the test date.**

Alternate dates for the final exam are allowed but **require approval from the Dean of Students.**

Preparation for tests: Test questions typically require that you not only master the terminology and sequence of events in a physiological process, but also be able to apply the knowledge to new situations. Study questions will be provided before each test. It is highly recommended that you read the Blackboard notes for each lecture **before** attending the lecture.

Paper Discussions:

Paper discussions will consist of reading an assigned original research paper, and then writing a 1-page summary of the paper (**5 points, due by 1:00 PM the day of the discussion; late summaries will lose 1 point**), and discussing the paper in class (**5 points**).

The **written summary** should include:

- a) the purpose/hypothesis of the paper
- b) a description of each figure/table including what was measured and what was found (you can focus on the most important figures in the paper if there are many)
- c) the main conclusions/significance of the paper

Summaries can be written in paragraph or outline/bullet-point form (your choice). **Submit your summaries on Blackboard by the deadline.**

Before class, your small group will be assigned a figure or table to present, and you will have time during class within your small group to organize your presentation before presenting it to the class.

Oral presentations should be equally divided among the 4 group members and include:

- a) the overall purpose (or questions to be addressed) of the experiments performed in the figure
- b) explanation of each panel in the figure – what measurement was made and what they found (before sure that you explain the X and Y-axes in graphs)
- c) the overall conclusions of the figure
- d) an advanced analysis would include the ability to discuss: limitations of the methods used, limitations of the conclusions made based on the evidence provided, ideas for future experiments, or ways to improve the experiments

Questions regarding the papers will appear on tests, so attendance and participation in important.

Missed Discussions: If you are going to miss a paper discussion, you may turn in a more detailed written summary (~4 pages) instead, which will be **due by 5:00 on the day of the discussion**, or points will be deducted (5% if turned in within 1 week, 10% after 1 week). Be advised that it is difficult to earn full credit with this written option. **You will only be able to take this option for 2 paper discussions.** If you miss more than 2 paper discussions, there is no opportunity to make-up the work.

Topics:

- I. Introduction to Aging and Human Longevity
 - A. What is Aging & How is it Studied
 - B. History of Human Life Span
 - C. Diseases of Aging
- II. Theories of Life Span and Aging
 - A. Comparative Approaches, Physiological Correlates, Genetic Models
 - B. Cellular Senescence and Death
 - C. Oxidants and Antioxidants in Aging

- D. Caloric Restriction and the Insulin/IGF-1 Pathway
- E. Genes Associated with Longevity
- III. Systemic Alterations with Aging
 - A. Nervous System
 - B. Sensory Systems
 - C. Endocrine System
 - D. Cardiovascular System
 - E. Respiratory System
 - F. Renal System
 - G. Urinary and Reproductive Systems
 - H. Musculo-Skeletal System
 - I. Skin
- IV. Strategies for Healthful Aging

Schedule:

Wed., Aug. 30	Lecture #1: Introduction to Aging/Longevity
Mon., Sept. 4	Lecture #2: Theories of Life Span and Aging (Genetic Models, Telomeres)
Wed., Sept. 6	Paper #1
Mon., Sept. 11	Lecture #3: Theories of Aging (Oxidative Stress)
Wed., Sept. 13	Paper #2
Mon., Sept. 18	Lecture #4: Caloric Restriction, Aging/Longevity Genes
Wed., Sept. 20	Paper #3
Mon., Sept. 25	TEST #1
Wed., Sept. 27	Lecture #5: Nervous System (Memory, Alzheimer's Disease)
Mon., Oct. 2	Paper #4
Wed., Oct. 4	Lecture #6: Nervous System (Motor Control, Parkinson's Disease)
Mon., Oct. 9	Paper #5
Wed., Oct. 11	Lecture #7: Nervous System (Sleep, Vision, Hearing)
FALL BREAK	
Wed., Oct. 18	Paper #6
Mon., Oct. 23	Lecture #8: Endocrine System (Stress)
Wed., Oct. 25	TEST #2
Mon., Oct. 30	Lecture #9: Endocrine System (Metabolism), Cardiovascular System
Wed., Nov. 1	Paper #7
Mon., Nov. 6	Lecture #10: Atherosclerosis, Respiratory and Renal Systems
Wed., Nov. 8	Paper #8
Mon., Nov. 13	Lecture #11: Urinary and Reproductive Systems, Bones/Joints
Wed., Nov. 15	Paper #9
Mon., Nov. 20	Lecture #12: Muscle, Skin, Strategies for Healthful Aging
Mon., Nov. 27	Video
Wed., Nov. 29	Test #3
Mon., Dec. 4	TBA
Wed., Dec. 6	Paper #10

FINAL EXAM Tues., Dec. 19, 2:00-5:00 (tentative)

Accommodations: It is the policy of William & Mary to accommodate students with disabilities and qualifying diagnosed conditions in accordance with federal and state laws. Any student who feels s/he may need an accommodation based on the impact of a learning, psychiatric, physical, or chronic health diagnosis should contact Student Accessibility Services staff at 757-221-2509 or at sas@wm.edu to determine if accommodations are warranted and to obtain an official letter of accommodation. For more information, please visit www.wm.edu/sas.