

BIOLOGICAL PROCESSES OF AGING

Population Health Sciences 810-155

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4:35-5:45 MW Fall 2007 125 McArdle

Objective: The objective of this course is to present an overview of the biological changes in people with the passage of time, which affect one's ability to adapt within the environment.

Content: The course is organized on the basis of lecture and class discussion

I. The Human Aging Process

A. Population Trends

1. Cultural variations
 - a. Environmental
 - b. Genetic
2. Disease vs. Aging

B. Individual Aging

1. Variations within and between individuals
2. Characteristics of aging

II. Biological Theories of Aging

A. Genetic Control as a Cause of Aging

1. Programmed intrinsic end point
2. Immunological

B. Aging and Embryology

III. Cellular Aging

A. Nuclear

1. Nucleoproteins
2. Nuclear Membrane

B. Cytoplasm

1. Mitochondria
2. Lysosomes and Lipofuscin
3. Other organelles.

IV. Circulation of Blood and Lymph

A. General characteristics of the aged cardiovascular system

B. Events of cardiac contraction

1. Mechanical events
2. Electrical events
3. Circulation

C. Arterial System

1. Pulmonary
2. Systemic
3. Heart

D. The capillaries and veins

V. Respiratory Function Changes

- A. Morphological
- B. Lung volume changes with age
- C. Changes in lung diffusion with age

VI. Temperature Regulation

VII. Exercise Testing and Physical Activity in the Aged

VIII Muscular Changes

- A. Skeletal Muscle
- B. Neuromuscular transmission
- C. Cardiac and smooth muscle

IX. Bone Changes

- A. Morphological - Metabolic
- B. Osteoporosis
- C. Mechanical loading of Bone

X. Nervous System Changes

- A. Morphological
- B. Metabolic
- C. Central and peripheral function

XI. Urogenital System

A. Renal function

1. Morphological,
2. The senile kidney

XII. Eyes and Ears

- A. Focusing of the eye
- B. Visual acuity
- C. Hearing

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<u>DATE</u>	<u>LECTURE TITLE</u>	<u>LECTURER</u>	<u>OUTLINE REF</u>
Sept 5	Human aging process	E. Smith	I A, B
Sept 10	Cellular Aging	E. Smith	II A
Sept 12	Biological Theories of Aging	T. Pugh	III A
Sept 17	Biological Theories of Aging	T. Pugh	III B
Sept 19	Circulation	K. Saupe	IV A, B
Sept 24	Circulation	K. Saupe	IV C
Sept 26	Circulation	K. Saupe	IV D
Oct 1	<u>EXAM--COVERS ALL LECTURES FROM SEPT 6 TO SEPT 26</u>		
Oct 3	Respiration	W. Reddan	V A
Oct 8	Respiration	W. Reddan	V B, C
Oct 10	Temperature Regulation	W. Reddan	VI
Oct 15	Exercise and Aging	E. Smith	VII
Oct 17	Muscle	E. Smith	VIII A
Oct 22	Muscle	E. Smith	VIII B
Oct 24	Bone	E. Smith	IX A
Oct 29	<u>EXAM--COVERS ALL LECTURES FROM OCT 4 TO OCT 23</u>		
Oct 31	Bone	E. Smith	IX B
Nov 5	Bone	E. Smith	IX C
Nov 7	Nervous System	E. Smith	X
Nov 12	Kidney	E. Smith	XI A
Nov 14	Ears and Eyes	E. Smith	XII A, B
Nov 19	<u>EXAM--COVERS ALL LECTURES FROM OCT 25 TO NOV 15</u>		

THE FIRST EXAM WILL COVER 7 LECTURES. EACH LECTURE IS WORTH 16 POINTS FOR A TOTAL OF A 112 POINTS PER EXAM. THE TWO LAST EXAMS WILL COVER 6 LECTURES WORTH 16 POINTS PER LECTURE FOR A TOTAL OF 96 POINTS. YOUR GRADE WILL BE BASED ON THE PERCENTAGE OF THE TOTAL POINTS (304) YOU ACQUIRE DURING THE SEMESTER. I AM SURE YOU WILL HAVE A GREAT SEMESTER.