

GRANDE PRAIRIE REGIONAL COLLEGE
DEPARTMENT OF PHYSICAL EDUCATION & ATHLETICS

PZ 2600 - A2,3
ELEMENTARY PHYSIOLOGY
COURSE OUTLINE: 1993-1994

I. GENERAL INFORMATION

Instructor: Ray Kardas
Office: C418
Phone: 539-2990
Class Hours: Both Semesters - M, W, F @ 11:00 - 11:50
Labs: (primarily in 2nd semester)
Section L1 - M @ 9:00 - 9:50
Section L2 - W @ 9:00 - 9:50

II. COURSE SEQUENCE:

<u>DATE</u>	<u>TOPIC</u>
Sept 8	Introduction; Homeostasis
Sept 10-22	Unit 1 - Cellular Physiology Cells as the basic functional units of the body Body Fluids/Compartments Homeostasis and feedback control Carbohydrates, fats and proteins Plasma membrane Cytoplasmic organelles Protein synthesis Cell division Cellular energy for physical activity
Sept 24	Test #1
Sept 27 - Oct 13	Unit 2 - Nerve, Synapse and Muscle Classification of neurons and nerves Electrical activity in neurons - ion gating in axons - resting potentials - action potentials - graded potentials - refractory period, threshold, all-or-none law Synaptic transmission and neurotransmitters Neuromuscular junction Skeletal transfer in exercise
Oct 11	Thanksgiving - No Classes

- Oct 15-29 Unit #3 - The Nervous System
- Organization review
 - Sensory and motor cortex
 - Spinal cord tracts
 - Sensory receptors
 - classification; adaptation; projection; pathways
 - Lower motor control of skeletal muscles
 - muscle spindles
 - Golgi tendon organs
 - other reflexes
 - Pyramidal and extrapyramidal tracts
 - Cerebellum and basal nuclei
 - Pain
- Oct 18 Test #2 - Unit 2
- Nov 1 Test #3 - Unit 3; The Nervous System
- Nov 3-14 Begin Unit 4: Autonomic Nervous System
- Comparison of the somatic and autonomic systems
 - Structure of the autonomic system
 - Physiology of the autonomic system
 - neurotransmitters
 - acetylcholine; norepinephrine; dopamine
 - cholinergic receptors
 - nicotinic; muscarinic
 - adrenergic receptors
 - alpha; beta
 - Actions of sympathetic nerves on specific effectors
 - Adrenal medulla
 - Actions of parasympathetic nerves on specific effectors
- Nov 15 Test #4 on Unit 4: Autonomic Nervous System
- Nov 17 - Unit #5 - The Special Senses
- Dec 3
 - Sense of Smell
 - Sense of Taste
 - Vestibular apparatus and equilibrium
 - The ear and hearing
 - sound; cochlea; neural pathway; processing
 - The eye and vision
 - optics; refraction; accommodation; retina; neural pathway
- Dec 6 Test #5 on Unit 5: The Special Senses
- 8 TBA

- Jan 5-14 Unit #6: Blood
- Volume, composition and origin
 - Plasma
 - formed elements
 - Blood changes with training
 - Hemostasis
 - Blood groups
 - Immune system - nonspecific and specific immunity
- Jan 17 Test on Unit #6 - Blood
- Jan 19 - Unit #7: Cardiovascular system
- Feb 4
- Properties of cardiac muscle
 - Electrical activity of the heart
 - Electrocardiogram
 - Cardiac cycle
 - Cardiac output and regulation of rate and volume
 - Hemodynamics
 - flow, pressure, resistance, regulation
 - The microcirculation and the exchange of fluid between capillaries and tissues
 - Regulation of blood volume by the kidneys
 - Cardiovascular responses to exercise stress
- Feb 7 Test on Unit #7 - The Cardiovascular system
- Feb 9-18 Unit #8: Respiratory Physiology
- Physical aspects of ventilation
 - Mechanics of breathing
 - Respiratory volumes and pulmonary function tests
 - Transport and exchange of gases
 - Regulation of respiration
 - Regulation of acid-base balance
 - Effect of exercise and high altitude on respiratory function
- Feb 21-25 Spring Break - No Classes
- Feb 28 - Unit #9: Renal Physiology
- Mar 11
- Microstructure of the kidney
 - Glomerular filtration and autoregulation
 - Tubular secretion
 - Clearance
 - Countercurrent multiplier
 - Renin-angiotensin pathway
 - Renal control of acid-base regulation
 - Kidney responses to exercise
- Mar 14 Test #9 on Unit 9 - Renal Physiology

- Mar 16-25 Unit #10: Gastrointestinal Physiology
- Digestive processes
 - mouth, stomach, small intestine, large intestine
 - Absorption of carbohydrates, proteins and fats
 - Liver, gallbladder and pancreas
 - Nutrition and performance
- Mar 28 Test #10 on Unit 10 - Gastrointestinal Physiology
- Mar 30 - Unit #11: Endocrinology
- Apr 11
- Role of the endocrine system
 - Hormones
 - chemistry, target cell specificity, mechanisms of action, control of secretion
 - Pituitary gland
 - hypothalamic relationships, anterior lobe hormones, posterior lobe hormones
 - Adrenal glands
 - functions and regulation
 - Thyroid and parathyroids
 - functions and regulation
 - Pancreas
 - functions and regulation
 - Endocrine changes with exercise and training
- Apr 8 Final Labs
- 11 Test #11 on Unit 11 - Endocrinology

III. COURSE EVALUATION

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| (1) | Eleven Class tests | 80% |
| (2) | Lab Test (*NOTE: Attendance is compulsory at all labs 2% will be deducted/absence) | 10% |
| (3) | Paper on Reproduction Physiology (Required) | 10% |

IV. COURSE TEXTS AND SUPPLEMENTARY MATERIAL

- (1) Sherwood, Lauralee; Human Physiology: From Cells to Systems, 2nd Ed.
St. Paul, West Publishing, 1993.
- (2) Sherwood, Lauralee; Learning Resource Manual to Accompany Human Physiology: From Cells to Systems, 2nd Ed.
St. Paul, West Publishing, 1993