

## FLORIDA STATE COLLEGE AT JACKSONVILLE

## COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER:	BSC 2086C
COURSE TITLE:	Human Anatomy and Physiology II
PREREQUISITE(S):	Completion of BSC 2085C with a grade of C or better
COREQUISITE(S):	None
CREDIT HOURS:	4
CONTACT HOURS/WEEK:	5
CONTACT HOUR BREAKDOWN:	
Lecture:	3
Laboratory:	2
Other _ ____:	
FACULTY WORKLOAD POINTS:	4.4
STANDARDIZED CLASS SIZE ALLOCATION:	24

## CATALOG COURSE DESCRIPTION:

This course is a continuation of Anatomy and Physiology I and includes: the cardiovascular system; the lymphatic system and immunity; the respiratory system; the digestive system and metabolism; the urinary system; fluid/electrolyte and acid/base balance; and the reproductive systems. Within Anatomy and Physiology II, these topics may or may not be covered in the sequence listed. The laboratory component of this course provides students with direct hands-on experiences to reinforce the anatomical and physiological concepts presented in lecture and encourage critical thinking, the understanding of scientific methodology and the application of scientific principles.

SUGGESTED TEXT(S): Human Anatomy and Physiology, Marieb, Wesly/Benjamin Cummings, Latest Edition

Special Package - ISBN 0321472268  
Includes: A Brief Atlas of the Human Body Interactive  
Physiology 9 System suite CD ROM Get Ready for A&P  
Workbook

SUGGESTED TEXT(S): (Continued)

Anatomy & Physiology Place CD (also on website)

Anatomy & Physiology Place - Ebook with tutorial, quizzes reviews, Labs, etc.

My A&P - Student's site - Includes Anatomy & Physiology Place, grade book, etc.

Anatomy 360 CD (also on the website)

IMPLEMENTATION DATE:

Fall, 1994 (was APB 2191C prior to this)

REVIEW AND MODIFICATION DATE:

Fall Term, 1993 (941)

Fall Term 2001 (2001)

Summer Term, 2002 (20023)

Fall Term, 2002 (20031)

Fall Term, 2006 (20071)

Fall Term, 2008 (20091) - Outline Review 2007

## COURSE TOPICS

CONTACT HOURS  
PER TOPIC

- I. Cardiovascular System 9 lec/lab combination
- A. The Blood
1. Functions of Blood
  2. Blood Components
    - a. Plasma
    - b. Red Blood Cells (Erythrocytes)
    - c. White Blood Cells (Leukocytes)
    - d. Platelets (Thrombocytes)
  3. Hemopoiesis
    - a. Erythropoiesis/
    - b. Leukopoiesis
    - c. Thrombopoiesis
    - d. Selected Disorders
  4. Recycling Iron from Hemoglobin
  5. Hemostasis
    - a. Vasoconstriction
    - b. Platelet Plug Formation
    - c. Clotting
    - d. Fibrinolysis
    - e. Selected Disorders
  6. Blood Groupings
    - a. ABO System
    - b. Rh System
- B. The Heart
1. Anatomy
  2. Major vessels
  3. Coronary Circulation
  4. Conduction System of the Heart
  5. Physiology of Cardiac Muscle Contraction
  6. Cardiac Cycle
  7. The Electrocardiograph
    - a. Components of an Electrocardiogram
  8. Cardiac Output
    - a. Stroke Volume
    - b. Heart rate
  9. Selected Disorders
    - a. Angina Pectoris
    - b. Myocardial Infarction
    - c. Coronary atherosclerosis
    - d. Congenital Disorders
- C. The Blood Vessels & Hemodynamics
1. Comparative Microanatomy of Artery, Vein, and Capillary
  2. Anatomy and Physiology of Microcirculations
  3. Classification of Capillaries

## COURSE TOPICS (CONTINUED)

CONTACT HOURS  
PER TOPIC

4. Distribution of Blood Throughout the Body
5. Hydrostatic and Osmotic Pressures and Capillary Exchange
6. Edema
7. Hemodynamics
  - a. Factors that Affect it
  - b. Blood Pressure
  - c. Blood Flow
  - d. Neural Regulation of Blood Pressure
  - e. Hormonal Regulation of Blood Pressure
  - f. Shock and Homeostasis
8. Evaluating Circulation
  - a. Pulse and Pulse Points
  - b. Blood Pressure
9. Selected Disorders
10. Circulatory Routes
  - a. Pulmonary Circulation
  - b. Systemic Circulation
    - Arterial System
    - Venous System
  - c. Selected Disorders
    - Aneurysms
    - Varicosities
    - Orthostatic hypotension
    - Hypertension

## II. Lymphatic System and Immune System

3 lec/lab combination

- A. Functions of Lymphatic system
- B. Structural Organization of the Lymphatic System
  1. Lymphatic Ducts
  2. Lymph Nodes
  3. Spleen
  4. Thymus
  5. Red Bone Marrow
  6. Lymphoid Tissues
- C. Lymph Pathway
- D. Nonspecific Resistance to Disease
  1. External Defenses
  2. Internal Defenses
- E. Specific Resistance to Disease
  1. Antigen Presenting Cells (APC)
  2. Major Histocompatibility Complex (MHC) Antigens
  3. Complement System

## COURSE TOPICS (Continued)

CONTACT HOURS  
PER TOPIC

4. Cell-Mediated Immune Response
  - a. T Cells
    - T4 (CD4) Cells
    - T8 (CD8) Cells
  - b. Cytotoxic (Killer) T Cells
  - c. Helper T Cells
  - d. Memory T Cells
5. Antibody-Mediated Immune Response
  - a. B Cells
  - b. Plasma Cells
  - c. Memory B Cells
6. Antibodies (Immunoglobulins)
  - a. Structure of Antibodies
  - b. Classes of Antibodies
  - c. Immunological Memory
- B. Inflammation
- C. Self-Recognition and Immunological Tolerance
- D. Selected Disorders
  - a. Type I hypersensitivity
  - b. Type II hypersensitivity
  - c. Type III hypersensitivity
  - d. Type IV hypersensitivity

## III. Digestive System

6 lec/lab combination

- A. General Functions of the Digestive System
- B. Structural Organization of the Digestive System
  1. Mouth
    - a. Salivary Glands
    - b. Dentitions
    - c. Selected Disorders
  2. Pharynx
    - a. Anatomy and Physiology
  3. Esophagus
    - a. Anatomy and Physiology
  4. Deglutition
  5. Stomach
    - a. Gross Anatomy and Microanatomy
    - b. Factors Affecting Gastric Activity
    - c. Factors Affecting Gastric Emptying
    - d. Selected Disorders
  6. Small intestine
    - a. Gross Anatomy and Microanatomy
    - b. Mechanical and Chemical Digestion
    - c. Absorption of Nutrients
    - d. Selected Disorders

## COURSE TOPICS (Continued)

CONTACT HOURS  
PER TOPIC

- e. Hepatic Portal System
  - Monosaccharides
  - Amino Acids and Oligopeptides
  - Short-Chain Fatty Acids
- f. Lymphatic System
  - Long-Chain Fatty Acids
  - Chylomicrons
- 7. Colon and rectum
  - a. Gross Anatomy and Microanatomy
  - b. Mechanical and Chemical Digestion
  - c. Absorption of Nutrients
  - d. Defecation Reflex
  - e. Selected Disorders
- 8. Pancreas
  - a. Gross Anatomy and Microanatomy
  - b. Role of Pancreas in Digestion
  - c. Selected Disorders
- 9. Liver
  - a. Gross Anatomy and Microanatomy
  - b. Role of Liver in Digestion
  - c. Other Functions of the Liver
  - d. Selected Disorders
- 10. Gall bladder
  - a. Gross Anatomy and Microanatomy
  - b. Role of Gall bladder in Digestion
  - c. Selected Disorders

## IV. Metabolism and Nutrition

3 lec/lab combination

- A. Overview of Basic Organic Chemistry
- B. ATP Metabolism
  - 1. Catabolism
  - 2. Anabolism
  - 3. Phosphorylations
- C. Cellular Respiration
  - 1. Aerobic
    - a. Glycolysis
    - b. Krebs (Citric Acid) Cycle
    - c. Electron Transport Chain
    - d. Substrate Level Phosphorylation
    - e. Oxidative Phosphorylation
    - f. Dehydrogenation
    - g. Decarboxylation
    - h. Role of Vitamins
    - i. Role of Minerals

## COURSE TOPICS (Continued)

CONTACT HOURS  
PER TOPIC

- 2. Anaerobic
  - a. Glycolysis
  - b. Fermentation
- D. Glycogenesis and Glycogenolysis
- E. Lipid-Carbohydrate Connection
  - 1. Lipolysis
  - 2. Beta Oxidation
  - 3. Ketogenesis
  - 4. Gluconeogenesis
- F. Lipid-Protein Connection
  - 1. Lipogenesis
  - 2. Chylomicrons
  - 3. Very Low Density Lipoproteins
  - 4. Low Density Lipoproteins
  - 5. High Density Lipoproteins
  - 6. Cholesterol Transport
- G. Protein-Carbohydrate Connection
  - 1. Proteolysis
  - 2. Nonessential Amino Acids
  - 3. Deamination and Transamination
  - 4. Gluconeogenesis
- H. Metabolic States
  - 1. Absorptive State
  - 2. Postabsorptive State
- I. Heat and Energy Balance
- J. Regulation of Food Intake
- K. The Food Guide Pyramid
- L. Vitamins
  - 1. Classification of Vitamins
    - a. Fat-soluble
    - b. Water-soluble
  - 2. Vitamin Deficiency
  - 3. Hypervitaminosis
- M. Minerals
  - 1. Major Minerals
    - a. Calcium
    - b. Phosphorus
    - c. Potassium
    - d. Sulfur
    - e. Sodium
    - f. Chloride
    - g. Magnesium
    - h. Iron
  - 2. Trace elements

## COURSE TOPICS (Continued)

CONTACT HOURS  
PER TOPIC

- N. Adequate Diets
- O. Nutritional Requirements

## V. Reproduction and Development

9 lec/lab combination

- A. Major Functions of the Reproductive Systems
- B. Embryonic Development of the Reproductive Systems
- C. The Male reproductive System
  - 1. Gross Anatomy
  - 2. Scrotum and Testes
    - a. Microanatomy and Functions
  - 3. Epididymis
    - a. Microanatomy and Functions
  - 4. Ductus (Vas) Deferens and Ejaculatory Duct
    - a. Microanatomy and Functions
  - 5. Urethra
    - a. Microanatomy and Functions
  - 6. Penis
    - a. Gross Anatomy and Microanatomy
    - b. Functions
  - 7. Seminal Vesicles
    - a. Microanatomy and Functions
  - 8. Prostate Gland
    - a. The Microanatomy and Functions
  - 9. Bulbourethral Glands
    - a. Microanatomy and Functions
  - 10. Semen
  - 11. Meiosis and Spermatogenesis
  - 12. Hormonal Regulation of Testicular Functions
  - 13. Selected Disorders
- D. The Female Reproductive System
  - 1. Gross Anatomy of the Female Reproductive System
  - 2. Ovaries
    - a. Microanatomy and Functions
  - 3. Uterine (Fallopian) Tubes
    - a. Microanatomy and Functions
  - 4. Uterus
    - a. Gross Anatomy and Microanatomy
    - b. Functions
  - 5. Vagina
    - a. Microanatomy and Functions
  - 6. Vulva
    - a. Gross Anatomy and Functions
  - 7. Mammary Glands
    - a. Microanatomy and Functions

## COURSE TOPICS (Continued)

CONTACT HOURS  
PER TOPIC

- 8. Meiosis and Oogenesis
- 9. Hormonal Regulation of the Ovarian Cycle
- 10. Hormonal Regulation of the Menstrual (Uterine) Cycle
- 11. Birth Control Methods
  - a. Surgical Sterilization
  - b. Hormonal Methods
  - c. Intrauterine Methods
  - d. Spermatocides
  - e. Barrier Methods
  - f. Periodic Abstinence
  - g. Coitus Interruptus
  - h. Induced Abortion
- 12. Aging and the reproductive Systems
- 13. Selected Disorders

## E. Embryonic Development

- 1. Fertilization
- 2. Germ Layer Formation
- 3. Development of the Extra Embryonic Membranes
- 4. Organ-System Developmental Time Table

## F. Human Genetics

- 1. Chromosomes as Carriers of Genetic Traits
- 2. Basic Terminology
- 3. Monohybrid Crosses
- 4. Sex Linked Traits
- 5. Genetic Disorders and Birth Defects

## VI. Respiratory System

6 lec/lab combination

- A. Major Functions of Respiratory System
- B. Structural Organization of the Respiratory System
- C. Nasal Cavity and Paranasal Sinuses
  - 1. Gross Anatomy and Functions
- D. Pharynx
  - 1. Gross Anatomy and Functions
- E. Larynx
  - 1. Gross Anatomy and Functions
- F. Trachea
  - 1. Gross Anatomy and Microanatomy
  - 2. Functions
- G. Bronchial Tree
  - 1. Gross Anatomy and Microanatomy
  - 2. Functions
- H. Lungs
  - 1. Gross Anatomy and Microanatomy
  - 2. Functions

## COURSE TOPICS (Continued)

CONTACT HOURS  
PER TOPIC

- I. Pulmonary Ventilation
  - 1. Boyle's Law
  - 2. Muscles of Inspiration and Expiration
- J. Lung Volumes and Capacities
- K. Exchange of Oxygen and carbon Dioxide
  - 1. External Respiration
  - 2. Internal Respiration
- L. Dalton's Law of Gases and Partial Pressures
- M. Oxygen-Hemoglobin Dissociation Curve
  - 1. Relationship between Hemoglobin and Oxygen Partial Pressure
  - 2. Factors Affecting Hemoglobin's Affinity for oxygen
- N. Carbon Dioxide Transport
- O. Atmospheric Pressure and Henry's Law of Gases
  - 1. The Bends
  - 2. Hyperbaric Oxygenation
- P. Regulation of Respiration
  - 1. Respiratory Center of the Brainstem
  - 2. Cortical Influences
  - 3. Chemical Influences
- Q. Selected Disorders

## VII. Urinary System

6 lec/lab combination

- A. General Functions of the Urinary System
- B. Structural Organization of the Urinary System
- C. Kidneys
  - 1. Gross Anatomy and Microanatomy
    - a. Renal Capsule
    - b. Renal Cortex
    - c. Renal Medulla
    - d. Renal Pelvis
    - e. Renal Calyces
    - f. Renal Hilus
    - g. Renal Circulation
- D. Nephrons
  - 1. Types: Cortical Nephrons & Juxtamedullary Nephrons
  - 2. Microanatomy
    - a. Renal corpuscle, Proximal Convoluted Tubule, Distal Convoluted Tubule, Loop of Henle, Ascending limb, Descending limb
  - 3. Role in Urine Formation
    - a. Glomerular Filtration
    - b. Tubular Secretion
    - c. Tubular Reabsorption
    - d. Primary Active Transport
    - e. Secondary Active Transport

## COURSE TOPICS (Continued)

CONTACT HOURS  
PER TOPIC

- f. Urinalysis
  - Chemical Analysis
  - Microscopic Analysis
- 4. Countercurrent Mechanism and Water Regulation
- 5. Juxtaglomerular Apparatus & Blood Pressure Regulation
- E. Renal Blood Supply
- F. Ureters
  - 1. Microanatomy and Functions
- G. Urinary Bladder
  - 1. Gross Anatomy and Microanatomy
  - 2. Functions
  - 3. Micturition Reflex
- H. Urethra
  - 1. Microanatomy and Functions
- I. Urine
  - 1. Composition
  - 2. Abnormal Constituents
- J. Selected Disorders

## VIII. Fluid and Electrolyte Balance

3 lec/lab combination

- A. Distribution of Body Fluids
- B. Fluid Exchange Between Compartments
- C. Electrolytes in Body Fluids
  - 1. Anions
    - a. Cl<sup>-</sup>, Bicarbonate
    - b. Functions
    - c. Effects of Excess Anions
    - d. Effects of Insufficient Anions
  - 2. Cations
    - a. Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>2+</sup>
    - b. Functions
    - c. Effects of Excess Cations
    - d. Effects of Insufficient Cations
- D. Regulation of Acid-Base Balance
  - 1. Carbonic acid-bicarbonate Buffer System
  - 2. Protein Buffer System
  - 3. Phosphate Buffer System
- E. Disorders of Acid-Base Balance
  - 1. Respiratory Acidosis
    - a. Causes
    - b. Signs and Symptoms
  - 2. Respiratory Alkalosis
    - a. Causes
    - b. Signs and Symptoms
  - 3. Metabolic Acidosis

## COURSE TOPICS (Continued)

CONTACT HOURS  
PER TOPIC

- a. Causes
  - b. Signs and Symptoms
4. Metabolic Alkalosis
- a. Causes
  - b. Signs and Symptoms

TOTAL NUMBER OF CONTACT HOURS

45

IX. LABORATORY TOPICS—Faculty must select 30 hours of laboratory activities from the following list  
Topics indicated with \*\* must be covered with a hands-on activity

A.	Cardiovascular System **	6
	1. Blood	
	2. Anatomy of the Heart	
	3. Major blood vessels	
	4. Blood pressure and pulse	
B.	Lymphatic System	2
C.	Digestive System **	4
D.	Metabolism and Nutrition	2
E.	Reproduction and Development **	4
	1. Anatomy of male reproductive system	
	2. Anatomy of female reproductive system	
	3. Development	
F.	Human Genetics	2
G.	Respiratory System **	4
H.	Urinary System **	4
I.	Fluid and Electrolyte Balance	2
J.	Exercises at the discretion of the instructor	2-8
	Lab Testing	
	TOTAL LABORATORY HOURS	30



Course Prefix and Number: <b>BSC 2086C</b>	Semester Credit Hours: <b>4</b>
--	---------------------------------

Course Title: <b>Human Anatomy and Physiology II</b>
--

Discipline Area for the Course:

<input type="checkbox"/> Communication	<input type="checkbox"/> Mathematics	<input type="checkbox"/> Social & Behavioral Sciences
<input type="checkbox"/> Humanities & Visual/Performing Arts	<input checked="" type="checkbox"/> Natural Sciences	<input type="checkbox"/> Other-Designated Option

INTELLECTUAL COMPETENCIES:

<input checked="" type="checkbox"/> Reading	<input checked="" type="checkbox"/> Speaking	<input checked="" type="checkbox"/> Critical Analysis	<input checked="" type="checkbox"/> Quantitative Skills	<input checked="" type="checkbox"/> Scientific Method of Inquiry
<input checked="" type="checkbox"/> Writing	<input checked="" type="checkbox"/> Listening	<input checked="" type="checkbox"/> Information Literacy	<input checked="" type="checkbox"/> Ethical Judgment	<input checked="" type="checkbox"/> Working Collaboratively

Learning Outcomes	Method Of Assessment	
1	Explain and apply major concepts in human anatomy and physiology including the cardiovascular system, the lymphatic system and immunity, the respiratory system, the digestive system and metabolism, the urinary system and fluid and electrolyte balance and the reproductive system.	Written tests, reports and/or use of equipment to demonstrate student competency in field.
2	Demonstrate knowledge of scientific method.	Formulate problem, make observations, derive and test hypothesis and make conclusions.
3	Communicate scientific ideas through oral or written assignments.	Written reports and/or oral presentations demonstrate ability to communicate scientific ideas.
4	Interpret scientific models such as formulas, graphs, tables and schematics, draw inferences from them and recognize their limitations.	Written reports of lab experiments and/or written tests demonstrate student competency in the application of scientific knowledge.
5	Demonstrate problem solving methods in situations that are encountered outside of the classroom.	Students use demonstrations, group discussions, written tests, laboratory reports, research projects and/or field experiences to illustrate competence in recognizing and evaluating various scientific processes.
6	Demonstrate proper laboratory technique including safety in the use and care of laboratory equipment and materials.	Results from laboratory work and experiments demonstrate student competency in laboratory technique.
7		
8		
9		
10		

Name of Person Completing This Form: Nancy Webster Yurko, Gary Hill, Fred Muth

Signature: \_\_\_\_\_ Date: 04/2005



Course Prefix and Number: BSC2086C	Semester Credit Hours: 4
Course Title: Human Anatomy and Physiology II	

Discipline Area for the Course:

<input type="checkbox"/> Communication	<input type="checkbox"/> Mathematics	<input type="checkbox"/> Social & Behavioral Sciences
<input type="checkbox"/> Humanities & Visual/Performing Arts	<input checked="" type="checkbox"/> Natural Sciences	<input type="checkbox"/> Other-Designated Option

INTELLECTUAL COMPETENCIES:

<input checked="" type="checkbox"/> Reading	<input checked="" type="checkbox"/> Speaking	<input checked="" type="checkbox"/> Critical Analysis	<input checked="" type="checkbox"/> Quantitative Skills	<input checked="" type="checkbox"/> Scientific Method of Inquiry
<input checked="" type="checkbox"/> Writing	<input checked="" type="checkbox"/> Listening	<input checked="" type="checkbox"/> Information Literacy	<input checked="" type="checkbox"/> Ethical Judgment	<input checked="" type="checkbox"/> Working Collaboratively

KNOWLEDGE	Primary	Secondary	N/A	VALUE	Primary	Secondary	N/A
A. Global and Historical Knowledge & Understanding			X	Intellectual honesty	X		
• Comprehends a general knowledge of the nature, origins and contributions of major civilizations			X	Curiosity and openness to new ideas	X		
• Comprehends the workings and interrelations of personal, business and government economies			X	Recognition of one's own creative potential	X		
• Comprehends political, social and economic systems and their effects upon society				Acceptance of and respect for differences among people and cultures	X		
B. Cultural and Aesthetic Knowledge and Understanding							
• Comprehends the contributions of the arts and humanities to the human experience on a personal, national or global level			X	Civic Engagement		X	
• Comprehends the historical development of the arts and sciences			X	Lifelong Learning	X		
• Comprehends religious and cultural systems and their effects upon society			X				
C. Human Awareness and Understanding							
• Comprehends the dynamics of human behavior and the process of increasing self-awareness, growth and development	X						
• Comprehends the stages of human development and the dynamics of human relationships in diverse cultures		X					
• Comprehends the factors that promote physical, mental and social well-being	X						
D. Mathematics, Science and Technology							
• Comprehends the basic concepts and investigative processes of the natural sciences	X						
• Comprehends the breadth, significance and development of the mathematical sciences	X						
• Comprehends the ways science and technology have shaped and continue to reshape human cultures and the environment	X						

Name of Person Completing This Form: \_\_\_\_\_ Nancy Yurko \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_ 11/8/02 \_\_\_\_\_