SYLLABUS

BIO 211 - ANATOMY & PHYSIOLOGY I

Fall Semester, 2008

Lecture: CRN 30033, Section M02 12:30 - 1:55 T/Th, Rm. 216
Lab: CRN 30037, Section M2A 9:00 - 12:00 Tuesday, or
CRN 30039, Section M2B 9:00 - 12:00 Thursday, Rm. 214

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Office Hours: Monday and Wednesday; 10:00-11:00,
Tuesday and Thursday; 2:00 – 3:00
other times by appointment

COURSE: BIO 211 - Anatomy & Physiology I is the first semester of a two semester sequence whose purpose is to facilitate the learning of body structure and function needed to serve as requirement for nursing and other allied health professions, as well as satisfy the lab science requirements for the Liberal Art/Sciences and General Studies major. In order to receive knowledge of all body systems, the student should complete this course along with BIO 212 - Anatomy & Physiology II. This is especially important if transferring to a four-year institution with a major requiring a full academic year of anatomy and physiology or if the student is enrolled in Three River's nursing. *BIO 211 with a minimum grade of C is the pre-requisite for BIO 212. BIO 211 and 212 with a minimum grade of C+ is also the pre-requisite for the TRCC nursing program*. BIO 211 presents the students with a lecture/laboratory study of basic biological chemistry, cell, tissue, organ, body fluid and cavity organization and nervous, skeletal, and muscular.

PRE-REQUISITE FOR THE COURSE: General Biology I (BIO 121) and Concepts of Chemistry (CHE 111) or equivalent with a minimum grade of C or instructor's permission

CREDIT; 4 credit hours consisting of 3 contact hours of lecture and 3 hours of laboratory per week during the Fall semester.

REQUIRED TEXTS;

Fundamentals of Anatomy and Physiology by Frederic Marini and Judi Nath, 8th edition, Benjamin-Cummings Publishers. (with COURSE COMPASS)

Pictorial Anatomy of the Cat, by Stephen Gilbert, University of Washington Press, 1999.

RECOMMENDED TEXTS: (optional)

Visual Guide to Human Physiology by Paul A. Krieger. Morton Publishing Company, 2008

Get Ready for A&P by Lori Garrett, Benjamin-Cummings Publishers, 2008 (An e-book version is on Course Compass

Outline of Cat Anatomy with Reference to Human, by Stephen Gilbert, Univ. of Washington Press 2000, ISBN: 0-295-97818-x

*The texts listed above will also be used for BIO 212. **The student is also expected to provide their own dissecting kit and gloves**, which are available from the bookstore.

GENERAL COURSE OBJECTIVES:

1. Provide students with a laboratory science to satisfy the science requirements of Three River's LAS or GS Associate Degree.
2. To fulfill pre-requisite and co-requisite anatomy and physiology requirements for Three River's Nursing.

3. To fulfill pre-requisite and co-requisite anatomy and physiology requirements for allied health programs.
4. Provide students with an undergraduate level study of human body systems.
5. Provide students with a foundation for study of the medical, biological, or physical sciences.
6. Provide students with critical thinking and problem solving skills.
7. Demonstrate the biological sciences and how they relate to other disciplines.
8. Illustrate the interdependence of all life forms operating on natural laws with the physical environment.
9. Encourage not only awareness of the student's natural uniqueness but also their role as an interrelated biological organism of this planet.

CLASS ATTENDANCE:

Attendance of class is required. Attendance is taken. Absences can be very detrimental due to the nature of the material. An explanation of all absences is very much appreciated, especially if presented in advance when possible. It is the student's responsibility to obtain materials and notes for any classes that they miss.

METHODS OF STUDENT EVALUATION; GRADING POLICIES

A. The student's grade for the course represents their ability to master course objectives, attitude, rate of improvement, proficiency and knowledge of course material.

B. Final letter grades are determined by converting accumulated points into a percentage score using the following formula:

percentage score = number of points you have accumulated on exams divided by the total number of points possible multiplied by 100

C. Points are obtained by the following methods of evaluation:

l. **Lecture**

a. Quizzes: Quizzes worth 15 points each will be given once a week on Wednesdays on line *on the Course Compass web site*. Their content and times available will be announced in the announcement section of Course Compass and by email . Each will consist of 15 multiple choice questions worth one point each. **If missed, they cannot be made-up**, however the lowest quiz score will be dropped at the end of the semester.

b. Major Exams: Three major exams of 140 points each will be given. Each will evaluate the student's knowledge over material given since the last major exam. **(see class schedule, p.26)** They will consist of 70 multiple choice questions worth two points each.

c. Basic biology & chemistry background: A pre-test of 30 points over basic biology and chemistry knowledge will be given. If a passing score is not attained, a post-test may be taken by the student. **See p. 6 for details**.

d. Extra Credit: There will usually be extra credit questions attached to the major

exams and points given for the ADAM Interactive Physiology modules.

2. **Laboratory:**
   a. Quizzes; A lab quiz over anatomical terminology worth 15 points and a lab quiz over the eye and ear worth 45 points will be given.
   b. Practical exams: Three identification type exams will be given: tissue identification, bone identification, and muscle identification. Each will be worth 50 points.
   c. Lab reports: A short report of a cellular biology lab exercise and a short report of an experiment of diffusion and osmosis, each worth 15 points, will be written.

D. Percentage contribution of each evaluation process to the overall lecture/lab score and to the overall grade:
   a. weekly quizzes: 2.6% of lecture, 1.8% overall (each); 21% of lecture, 14.7% overall (all 8 or 9 for the semester)
   b. major exams: 24.6% of lecture, 17.2% overall (each of the three)
   c. pre or post-test: 5.3% of lecture, 3.7% overall
   d. anatomical term quiz: 6% of lab, 1.8% overall
   e. eye/ear quiz: 18% of lab, 5.4% overall
   f. tissue identification: 20% of lab, 6% overall
   g. bone identification: 20% of lab, 6% overall
   h. muscle identification: 20% of lab, 6% overall
   i. cell lab report: 6% of lab, 1.8% overall
   j. diffusion/osmosis lab report: 6% of lab, 1.8% overall

E. Exam and quiz questions for lecture and/or laboratory material may consist of multiple choice, true/false, fill in the blank, matching, identification, or essay questions. Some questions might be reserved as an extra credit option.

F. Absence on examination days:
Students are required to take exams as scheduled.

G. Final letter grades for the course are determined by the following steps:
   l. Converting lecture points into a percentage score.
   2. Converting laboratory points into a percentage score.
   3. Combining 70% of the lecture percentage score with 30% of the laboratory percentage score to determine an overall course percentage score. (Lecture is worth 70% and lab 30% of the final grade.)
   **4. The final course grade is determined from the overall course percentage score related to the following percentage scale:

100% = A+*	80 - 81% = B-	60 - 67% = D
92 - 99% = A	78 - 79% = C+	0 - 59% = F
90 - 91% = A-	72 - 77% = C	
88 - 89% = B+	70 - 71% = C-	
82 - 87% = B	68 - 69% = D+	

*A+ cannot be reported to the registrar's office as an official grade.
**The instructor reserves the right to use subjective evaluation, especially in cases where the final percentage score is on a borderline between grades.

Procedure for Withdrawing from the Course(s):

A student who finds it necessary to discontinue a course must complete a withdrawal form obtained from the Registrar's Office. **Students who do not withdraw by December 15, but stop attending will be assigned a "F" grade**, signifying failure and no credit. F grades count as courses attempted and may adversely affect the good standing status of the student receiving the grade.

Academic Integrity at Three Rivers

Academic integrity is essential to a useful education. Failure to act with academic integrity severely limits a person's ability to succeed in the classroom and beyond. Furthermore, academic dishonesty erodes the legitimacy of every degree awarded by the College. In this class and in the course of your academic career, present only your own best work; clearly document the sources of the material you use from others; and act at all times with honor. (taken from the Academic Integrity policy of Three Rivers Community College)

Disabilities:

If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact the Disabilities Counseling Services at 383-5240. To avoid any delay in the receipt of accommodations, you should contact the counselor as soon as possible. Please note that I cannot provide accommodations based upon disability until I have received an accommodation letter from the Disabilities Counselor. Your cooperation is appreciated.

Revisions to the Syllabus

The instructor reserves the right to revise the academic schedule, objectives, and/or topical outline contained in this syllabus

SPECIFIC OBJECTIVES FOR THE LECTURE PORTION OF THE COURSE

(objectives with an * will not be covered formally in class but students are expected to learn on their own and will be tested).

CLASSROOM CONTENT IS DIVIDED INTO THE FOLLOWING LEARNING UNITS. CORRESPONDING LEARNING UNITS WITH ADDITIONAL RESOURCES ARE FOUND ON THE COURSE COMPASS WEB SITE

I. **Pre-Requisite Competencies**

It is expected that the student be competent in knowledge of basic biology chemistry so that a study of the human bodies structure and functions can be undertaken. This may be accomplished by a variety of means, the preferred being that the student review selected content they have learned in BIO 121 (General Biology I) and CHE 111 (Concepts of Chemistry) or equivalent taken as the pre-requisite courses for Anatomy & Physiology I. Methods of self instruction such as computer programs, videotapes, workbooks, or tutors are available.

At the beginning of the semester, students will be given a "pre-test" consisting of 60 multiple choice questions worth 30 points (1/2 pt. ea.) over this learning unit to determine the status of their basic biology/chemistry knowledge base and create a self review before the class starts. **(see schedule, p. 27)** It is a pass/fail test. Therefore if a score of 70% or better is attained, the student is automatically given the full 30 lecture points. If a score of 70% or better is not attained, no points will be given**. However, the student can choose to take a "post-test of the same point value and number of questions. If a score of 70% or better is attained on the "post-test", the students score will be changed from 0 to 30 (full point value given as if the student passed the "pre-test". The "post- test" is taken by appointment anytime before Exam #1 is given (see class schedule)

***Failing the "pre-test" is not justification for withdrawal from the course.*

Listed below is a list of competencies that will be tested over in the pre/post testing. These competencies deal with basic chemistry and cell biology which are covered in chapter 2 and 3 of the textbook.

*A. Be able to discuss the importance of matter and energy as it relates to the make-up of the life process

1. Define matter (solid, liquid, versus gas) and energy (potential versus kinetic and forms such as chemical, light, mechanical, nuclear, heat, etc.).
2. Define chemical elements and list the symbols of and major functions of the biologically importance elements listed in figure 2-1, p. 28 and those shown in pink in the periodic table in appendix III, p.A-39. Be aware that carbon, hydrogen, oxygen, and nitrogen are the most abundant elements making up the construction of life.
3. Describe atomic structure by defining: atom, subatomic particles (protons, neutrons, electrons), atomic number, atomic mass (weight), isotopes, and radioisotopes.
4. Be able to state what determines the difference of atoms of one element from another (atomic number).
5. If given the atomic number and atomic mass, be able to determine the number

of protons, neutrons, and electrons making up the structure of those atoms.

6. Define electron energy levels (shells) and state the significance of the outermost energy level.

Organize matter into most complex structure be becoming familiar with the following:

7. Compare ionic and covalent bonding (single versus double versus polar).
8. Define compounds, molecules, and ions (cation versus anion).
9. When reading or writing ions in symbolic form, be able to interpret the superscript as to the type of electrical charge (positive or negative) and its intensity.
10. When reading or writing a formula for a chemical compound, be able to interpret what elements are combined together and in what proportion. If reading a structural formula, also be able to interpret what type of chemical bonds are involved and the basic shape of the molecule.
11. Define molecular weight. If given a formula for a chemical compound and the atomic weights of the elements involved, be able to determine the molecular weight.

*B. Describe the basics of chemical reactions by accomplishing the following:

1. Define chemical reaction, reactants, and products.
2. Define metabolism, catabolism, anabolism, exergonic (exothermic), endergonic (endothermic), catalysts, and enzyme.

*C. Discuss the chemical make-up of living organisms based upon types of chemical compounds.

l. State the differences between inorganic and organic compounds and in reference to organic compounds, be able to define macromolecule, monomer, and polymer.

2 Discuss the importance of water.

a. Define solution, solute, solvent, hydrophilic, and hydrophobic.
b. Define ionization, electrolyte, acid, base, salts, and minerals.
c. Discuss measurements of solution concentrations such as percentage, gram-percent (gm/dl), mg-percent (mg/dl), moles or millimoles/liter, milliosmoles/liter, milliequivalents per liter (mEq/l). (See page 17 of *Applications Manual*)
d. Be able to use the pH scale to measure the concentration of hydrogen ions in an aquatic solution such as body fluids. If given a pH number, be able to state if it is neutral, acidic or basic (alkaline) and its relative strength. Be able to define acidosis and alkalosis by you knowing the normal pH of human blood.

3. Be able to discuss the role of carbohydrates in the life process.

a. Relate carbohydrates to sugars and starches and state the primary function of carbohydrates.
b. Relate simple sugars to monosaccharides and state the significance of glucose.
c. Relate complex sugars to disaccharides and polysaccharides. Define sucrose, glycogen, starch, and cellulose (plant fiber)
d. Describe how monosaccharides can be bonded together to form disaccharides or polysaccharides by a chemical mechanism called dehydration synthesis. Describe how polysaccharides or disaccharides are broken apart into monosaccharides by a chemical mechanism called hydrolysis.

e. Be able to recognize the basic molecular structure of a carbohydrate.

4. Discuss the role of lipids in relation to the life process.
   a. List the functions of lipids.
   b. Be familiar with the terms: fatty acids (saturated versus unsaturated, trans fats),
   c. glycerol, di- and triglycerides, steroids, fat-soluble vitamins (A,D,E,K), prostaglandins, and phospholipids.
   d. Relate the chemical mechanisms of dehydration synthesis and hydrolysis to the conversion of simple lipids like fatty acids to complex like triglycerides and visa versa.
   e. Be able to recognize the basic molecular structure of a fatty acid and a steroid.
5. Discuss the role of proteins in relation to the life process.
   a. Define amino acids.
   b. List the functions of proteins.
   c. Be able to recognize the basic molecular structure of an amino acid.
   d. Relate the chemical mechanism of dehydration synthesis and hydrolysis to the conversion of amino acids to polypeptides and visa versa.
   e. Define peptide bond, antigen, antibody, and enzyme.
   f. Briefly describe the mechanism of enzyme function using the terms substrate, active site, and product. (see page 52-53 of Martini)
6. Briefly discuss the role of nucleic acids in relations to the life process.
   a. Define nucleotides and be able to list the different types of N-bases.
   b. Briefly describe the purpose of DNA and RNA.
7. Discuss the role of adenosine tri-phosphate (ATP) for energy storage and transfer in biological chemical reactions
   a. Define adenosine tri-phosphate (ATP) and adenosine di-phosphate (ADP).

*D. Be able to discuss the cell as the basic structure of the human body.

1. Be able to list the components of the cell theory. (see p. 63 of Martini)
2. Describe the anatomy and physiology of a typical cell by being able to label a diagram, and/or describe the function of the following cellular structures:

cell membrane	endoplasmic reticulum	centrioles
centrosome	-granular vs agranular	ribosomes
nucleus	nuclear membrane	golgi complex
nucleoplasm	lysosome	chromatin
mitochondria	nucleolus	cytoplasm

3. Describe amoeboid, ciliary, and flagella movement of cells.
4. Briefly describe the process of cell reproduction.
   a. Define mitosis and state the significant outcome of the process.
   b. Describe basic chromosome structure and know how many human cells have.
   c. Describe the main intracellular events that occur during the phases of mitosis.
   d. Briefly compare mitosis and meiosis.

***will not be covered in class**

II. **Basic Biological Organization of the Human Body**

Upon completion of a study of basic organization of the human body, the student

should be able to correctly answer questions concerning the following:

A. Be able to list and describe the characteristics of living material.
B. Be able to describe the various levels of organization from atoms through organism level.
C. Be able to list the various body systems.
D. At the cellular level of biological organization, be able to describe the following:
   1. Distinguish between unicellular versus multicellular life forms. In reference to multicellular, understand what is meant by cell differentiation.
   2. Associated with cellular structures, be able to define and discuss the following in relation to respiration.

metabolism	acetyl co-enzyme A	Kreb's cycle
ATP-ADP	glycogenolysis	oxydative phosphorylation
glycolysis	mitochondrial structure	aerobic respiration
pyruvic acid	-outer/inner membrane	anaerobic respiration
glucose	-cristae	
glycogenesis	-matrix	

E. Discuss the organization of the potential dorsal and ventral cavities.
   l. Distinguish between cranial and vertebral cavity.
      a. State the contents of each.
      b. Define meninges and state their function.
   2. Distinguish between the divisions of the ventral cavity.
      a. List the major contents of the thoracic cavity.
      b. Pertaining to the thoracic cavity, define

mediastinum	diaphragm	pericardial cavity
visceral pleura	pleural fluid	pericardial fluid
parietal pleura	pericardium	pleural cavity

      c. List the major contents of the abdominal and pelvic cavity.
      d. Pertaining to the above cavities, define:

visceral and parietal peritoneum	peritoneal fluid
peritoneal cavity	diaphragm

III. **Tissues:**

Upon completion of a study of tissues, the student should be able to correctly answer questions concerning the following:

A. Define tissues and list the four main tissue types.
B. Describe epithelial tissue.
   1. List functions of epithelium, structural specialization's of epithelial cells, and how they maintain their integrity
   2. Classify epithelial tissue by cellular shape, layers, and associated structures.
   3. Give an example of the location of the following epithelial types:

simple and stratified squamous	simple and stratified columnar
simple and stratified cuboidal	ciliated pseudostratified columnar
transitional	neuralepithelium
germinal epithelium	

4. Briefly organize glandular epithelium into endocrine versus exocrine, simple versus compound and modes of secretion.

C. Be able to discuss connective tissue
   l. List the functions of the tissue.
   2. Contrast connective tissue to epithelium using the terms extracellular protein fibers, ground substance, and matrix.
   3. Distinguish between types of intercellular material by defining:
      connective tissue proper
      fluid connective tissue
      supporting connective tissue
      dense vs loose connective tissue
      regular vs irregular connective tissue
      reticular fibers
      elastic fibers
      collagenous fibers
      chondroitin sulfate
   4. Define and state the function of the following connective tissue cells:

mesenchyme	osteocyte	hemocytoblast
adipocyte	osteoblast	mast cell
plasma cell	erythrocyte	chondrocyte
osteoclast	leukocyte	fibroblast
macrophage	platelet	melanocyte

   5. Describe the structure and locations of the following types of connective tissue.

loose	adipose	elastic cartilage
dense	reticular	fibrocartilage
regular	elastic	fibrous
irregular	collagenous	bone
areolar	hyalin cartilage	blood

   6. Describe the microstructure of cartilage by defining or labeling a diagram the following: perichondrium, matrix, lacuna, chondrocytes.
   7. Describe the microstructure of bone by defining or labeling a diagram the following: matrix, lacuna, Haversian canal, osteocytes, lamella, canaliculi, osteon.
   8. Compare the differences and similarities of providing nutrients to chondrocytes of cartilage versus osteocytes of bone.

D. Be able to describe muscle tissue.
   l. Describe the functions of and the characteristics of muscle tissue.
   2. Describe the basic structural characteristics and location of skeletal, smooth, and cardiac muscle.

E. Briefly describe nervous tissue. (p. 134-135 of Martini only)
   1. Briefly describe the characteristics of the tissue.
   2. Briefly define: neuron, cell body, axon, dendrite, and neuroglia.

IV. **Skin:**

Upon completion of a study of the integumentary system, the student should be able to correctly answer questions concerning the following:

A. Define an organ, based upon tissue types functioning together, by using skin as an example.

B. List the functions of skin.

C. Describe or label on a diagram, the following skin structures:

epidermis	hair(follicles, root, shaft)
stratum corneum	sebaceous glands
stratum granulosum	sweat glands
stratum basale	nerve receptors
melanocytes	pilomotor (arrector pili) muscle
keratinocytes	ceruminous glands
keratin	mammary glands
dermis	

V. **Organization and Communication Between Fluid Compartments:**

Upon completion of a study of fluid compartments, the student should be able to correctly answer questions concerning the following:

A. Be able to discuss the organization of the body into fluid compartments.
   l. Define total body water, intracellular, extracellular fluid, plasma and interstitual fluid.
   2. State the normal quantity of fluid in each of the above.
   3. Discuss the effect of age, sex, and quantity of adipose tissue on percentage of body weight made up of fluid.
   4. Discuss the relative distribution of different types of electrolytes and protein between the fluid compartments.
   5. List the normal routes of intake and output of fluids.
   6. List miscellaneous extracellular fluid compartments.
   7. State the route of communication between intracellular and interstitual fluids and between interstitual and plasma fluid compartments.

B. Discuss transport of materials through the cell membrane.
   l. Describe the molecular construction of the cell membrane.
      a. Define phospholipid bilayer
      b. Organize membrane proteins into the following and be able to define each:

integral vs peripheral protein	enzymes
fibrous vs globular protein	receptors
anchors	carrier (transport) proteins
recognition proteins	channel proteins (leak vs gated)

   2. Define permeability and its various degrees.
   3. Discuss the following methods of moving chemicals through the cell membranes and factors influencing each:

diffusion	osmosis	passive transport
active transport	pinocytosis	phagocytosis
filtration	endocytosis	exocytosis

   4. Relating to osmosis, define isotonic, hypertonic, hypotonic, crenation, plasmolysis, hemolysis, normal saline, 5% dextrose, lactate Ringer's solution.
   5. Define transmembrane potential and state the cause of a resting membrane potential by relating diffusion, leak channels, and active transport of Na^+ and K^+ and explaining the Na-K pump.

C. Discuss communication between plasma and interstitual fluid via capillaries.
l. Describe the general structure of a capillary.
2. Define the following and relate them to inward and outward movements fluids through capillary walls:

capillary pressure	tissue colloid osmotic pressure
tissue pressure	effective osmotic pressure
effective hydrostatic pressure	filtration pressure
plasma colloid osmotic pressure	absorption pressure

D. Discuss the role of the lymphatic system for body fluid regulation.
*1. Describe the basic anatomy of the lymphatic system.
*2. Describe routes of lymphatic drainage for various areas of the body.
*3. Discuss the composition of, formation of, purpose of, and movement of lymph.
*4. List structures not drained by lymphatics.
*5. List various causes of edema.

***will not be covered in class**

VI. **Skeletal System:**

Upon completion of a study of the skeletal system, the student should be able to correctly answer questions concerning the following:

A. List the major functions of the skeletal system.
*B. Describe the microscopic construction of bone tissue (review objective III-C-7, p 10).
C. Organize the skeleton into axial and appendicular portions.
D. Organize bones into long, short, flat and irregular.
E. Diagram and discuss the structure of long bones using the following terms:

epiphysis	epiphyseal plate
diaphysis	medullar cavity
articular cartilage	red and yellow marrow
periosteum	spongy and compact bone
metaphysis	trabeculae
endosteum	

F. Differentiate between intramembranous and endochondral ossification.
G. Define and state the cause of the vertebral column curvatures.
H. Organize skeleton articulations (joints).
1. Define articulation and classify them into synarthrosic, amphiarthrotic, or diarthrosic according to degree of movement permitted.
2. Classify joints according to structure into sutures, synchondrosis, syndesmosis, symphysis, and synovial.
3. Diagram and discuss the basic structure of a synovial joint.
*I. Define the following joint movements:

flexion	eversion
extension	supination
abduction	pronation
adduction	protraction
rotation	retraction

circumduction dorsiflexion
inversion plantarflexion

*J. Define: ligament, tendon, tendon sheath, and bursae

***will not be covered in class**

VII **Nervous System:**

Upon completion of a study of the nervous system, the student will be able to correctly answer questions concerning the following subject matter:

A. Describe the overall construction, organization, and terminology associated with nervous tissue.
1. List the specialized characteristics of nervous tissue.
2. Describe the organization of neurons.
a. Describe the following parts of the neuron: cell body, axon, dendrites, teledendria, myelin sheath, node of Ranvier, and Schwann cells.
*b. Differentiate between the following types of neurons:
myelinated alpha, beta, and gamma
non-myelinated motor
unipolar sensory
bipolar internuncial
multipolar
3. Define neuroglia (glial cells).
4. Describe the structure of a nerve.
a. Be able to define epineurium, perineurium, endoneurium, and fasiculi as parts of a nerve.
*b. Distinguish between motor, sensory, and mixed nerves.
*5. Define the following nervous system terminology:
central nervous system somatic
peripheral nervous system visceral
receptor effector
sensory (afferent) ganglia
motor (efferent)
*6. Distinguish between gray and white matter by defining: cortex, nuclei, horns, nerve tracts, commissural, associational, projectional, ascending and descending

B. Discuss the processes involved in nerve impulse generation and conduction using such terms as:
ion channels (discuss types) -graded potentia
sodium-potassium pump -threshold potentials
transmembrane potentials -action potentials
-resting membrane potential
depolarization hyper-hypopolarization
repolarization refractory periods (absolute, relative)

C. Diagram and describe the synapse.
l. Be able to define synapse.
2. Relate the following to synapses:
bouton EPSP

synaptic cleft	IPSP
pre-postsynaptic membrane	calcium
synaptic vesicles	adrenergic
neurotransmitter	cholinergic
spacial summation	temporal summation

3. Be able to list and discuss chemicals used as neurotransmitters.
4. Compare and contrast adrenergic and cholinergic synapses and receptors involved

D. Diagram and discuss the anatomy of the brain.
1. Define and list the main structures of the telencephalon, diencephalon, mesencephalon, rhombencephalon, brain stem, and diagram the connection of each.
2. Diagram and describe the cerebrum using the following terms:

cerebral hemishphere	convolutions
cerebral cortex	sulcus
longitudinal fissure	fissure
central sulcus	primary motor area
lateral fissure	pre-motor area
transverse fissure	somesthetic area
frontal lobe	corpus callosum
parietal lobe	optic chiasma
occipital lobe	basal nucleus
temporal lobe	lymbic system

*3. Describe the location of and list the functions of the following lower brain structures: thalamus, hypothalamus, midbrain, pons, medulla, cerebellum.

E. Diagram and discuss the parts of and the function of the spinal cord.
1. Given a diagram of a cross-section view of the spinal cord, be able to divide the gray matter into anterior and posterior horns.
2. State the purposes of the following spinal nerve tracts: spinocerebellar, funiculus gracilis, funiculus cuneatus, rubrospinal, spinothalamic, corticospinal, pyramidal, and extrapyramidal.
3. State the level at which the spinal cord terminates.
4. Define cauda equina.
5. Divide the spinal cord into cervical, thoracic, lumbar, and sacral segments.

F. Describe the anatomy and function of the meninges by defining dura mater, venous sinus, epidural space, subdural space, arachnoid mater, subarachnoid space, and pia mater.

***will not be covered in class**

G. State the origin and trace the path of circulation of cerebro-spinal fluid using the following terms:

choroid plexus	aquaduct of Sylvius
lateral ventricles	4th ventricle
foramen of Monroe	foramen of Luschka and Magendie
3rd ventricle	arachnoid villi

H. Discuss the organization of the peripheral nervous system.
*1. State the name, number, and general function of the cranial nerves.
*2. Describe spinal nerves.
a. State the total number and number of cervical, thoracic, lumbar, and sacral, and coccygeal.
b. Describe the origin of spinal nerves by defining dorsal and ventral roots, dorsal root ganglia, anterior and posterior rami.
*3. Define, state the location of, and the spinal nerves involved in the make-up of the cervical, brachial, lumbar, and sacral plexus.
*4. State the general location and function of the following peripheral nerves: axillary, musculocutaneous, radial, median, ulnar, femoral, obturator, sciatic, pudendal, and phrenic nerves.
*5. Organize receptors into types: exteroceptors, proprioceptors, and interoceptors. Briefly state the functions of the following exteroceptors: free dendritic endings, Merkel discs, Meissner's, Ruffini's, and Pacinian corpuscles

I. Describe the reflex arc as the basic function of the nervous system.
1. Using the spinal cord, correctly locate sensory, internuncial, and anterior horn cells and describe the path of impulse conduction for the myotactic (knee jerk), and withdrawal reflex.
2. Trace the pathway sensory nerve impulses would take as they ascend up the spinal cord to the brain using the dorsal column and spinalthalamic tracts.
3. Trace the pathway motor nerve impulses would take as they descend down the spinal cord from the brain using the corticospinal tracts.

J. Define the purpose of and describe the make-up of the autonomic nervous system.
1. Contrast autonomic and somatic reflexes.
2. Discuss the difference between the parasympathetic and sympathetic divisions using such terms as:

craniosacral
thoracolumbar
pre-ganglionic fibers
post-ganglionic fibers
sympathetic chain ganglia
*celiac, superior and inferior mesenteric ganglia
adrenergic fibers
cholinergic fibers

3. Be able to describe the effect of sympathetic or parasympathetic stimulation on any major visceral organ.

***will not be covered in class**

VIII. **Myology** (study of muscle)

Upon completion of a study of muscle tissue, the student should be able to correctly answer questions concerning the following:

A. List and define properties of muscle tissue.
B. Contrast skeletal, smooth, and cardiac muscle tissue according to cellular

structure, location, arrangement, innervation, and physiological properties.

l. Describe cellular structure of the three muscle types using the following terms:

muscle fiber	striations
sarcolemma	I, A, H, and Z bands
sarcoplasm	intercalated discs
myofibrils	tight junctions
multinucleated	

2. Describe location of the muscle types.
3. Contrast innervation of muscle tissue types and define motor end plate.
4. Define motor unit.
5. Contrast the basic physiological differences between muscle tissue types according to speed of contraction, latent period, fatigue, refractory periods all or none principle, tonus, tetany, isometric and isotonic contraction.

C. Describe the overall anatomy of a skeletal muscle.

1. Describe the gross structure of a skeletal muscle by defining origin, insertion, and belly.
2. Describe muscle attachments such as tendons and aponeuroses.
3. Describe the fascia arrangement using the terms: epimysium, fasciculus, perimysium, and endomysium.

D. Describe the ultra-micro structure of skeletal muscle fibers using the following terms:

motor end plate	sarcoplasmic reticulum	myosin
sarcolemma	longitudinal tubules	cross bridges
myofibrils	cisternae	Z-bands
synaptic cleft	T-tubules	sarcomere
synaptic vesicles	triad	troponin
sarcoplasm	myofilaments	tropomyosin
calcium	actin	

E. Describe the contractile mechanism for skeletal muscle.

1. Discuss stimulation of the muscle fiber by describing the conduction across the motor end plate, depolarization of the sarcolemma and conduction into the myofibrils by T-tubules.
2. Describe release of calcium ions and the calcium pump associated with the sarcoplasmic reticulum.
3. Describe the ratchet theory of contraction using the relationships of calcium, actin complex, myosin, troponin, tropomyosin, ATP, ADP, creatine phosphate, and creatine.
4. Discuss ATP replacement by defining aerobic, anaerobic respiration, lactic acid, and oxygen debt.
5. List causes of skeletal muscle fatigue.
6. List the effects of exercise on skeletal muscle.

F. Discuss how muscles work as groups using such terms as prime mover, synergistic muscles, and antagonistic muscles.

*G. Identify the location of major muscles and muscle groups of the body. (Correlation with lab work)

***will not be covered in class**

SPECIFIC OBJECTIVES FOR THE LABORATORY PORTION OF THE COURSE

LABORATORY CONTENT IS DIVIDED INTO THE FOLLOWING LEARNING UNITS. CORRESPONDING LEARNING UNITS WITH ADDITIONAL RESOURCES ARE FOUND ON THE COURSE COMPASS WEB SITE

I. **Introduction to the Human Body Lab**

Upon completion of the following laboratory studies, the student should be able to correctly answer questions concerning the following:

A. Discuss the derivation of medical terminology.
B. Define and correctly use anatomical directions, planes, and regions when describing the human body.
C. Organize the body into its potential body cavities and list major organs found in each.
D. Locate exterior features and landmarks of the human body.

II. **Cell Structure and Mitosis Lab**

Upon completion of a lab study of microscopic usage, cell structure, and mitosis, the student should correctly complete a lab report.

A. Identify the major parts of a microscope and use the instrument effectively in study.
B. Be able to prepare a wet-mount slide for study under a microscope.
C. Identify major cellular structures with a light microscope using a variety of live and prepared specimens.
D. Identify cells in various stages of mitosis.

III **Identification of Tissues Lab**

The following tissue types are to be correctly identified by the student on a lab practical exam:

A. Epithelial tissue:
   1. simple squamous
   2. stratified squamous
   3. simple cuboidal
   4. stratified cuboidal
   5. simple columnar
   6. stratified columnar
   7. ciliated pseudostratified columnar
   8. transitional

B. Connective tissue:
   1. areolar
   2. adipose
   3. reticular
   4. hyalin cartilage
   5. elastic cartilage
   6. fibrocartilage
   7. elastic
   8. collagenous
   9. bone
   10. blood cells (erythrocytes,

leukocytes, platelets)

C. Muscle tissue: (smooth, skeletal, versus cardiac)

D. Nervous tissue: (neurons versus glial cells)

IV. **Principles of Diffusion and Osmosis Lab**

Upon completion of experimental procedures and terminology associated with diffusion through a liquid and colloidal solution, osmotic pressure, and tonicity, the student should correctly complete a laboratory report of their data and conclusions.

V. **Anatomy and Physiology of the Ear Lab**

Upon completion of a study of the ear, the student should be able to correctly answer questions concerning the following:

A. Describe the anatomy of the ear by locating and stating the functions of the following:

temporal bone	-stapes	scala vestibula
mastoid process	eustachian tube	cochlear duct (scala media)
outer, middle, inner ear	stapedius	basilar membrane
cerumenous glands	tensor tympani	tectoral membrane
auricle	semicircular canals	organ of Corti
tympanic membrane	cochlea	scala tympani
ear ossicles	oval window	vestibular-cochlear nerve
-malleus	round window	endolymph
-incus	vestibular membrane	perilymph

*B. Define middle ear (bone) and nerve deafness.

***will not be covered in class**

VI. **Anatomy and Physiology of the Eye Lab**

Upon completion of a study of the eye and its associated structures, the student should be able to correctly answer questions concerning the following:

A. List the five special senses.

B. Briefly describe the orbits.

1. List the openings into the orbit and their purpose.
2. List the contents of the orbit.

C. Describe the construction of the anterior coverings of the orbit.

1. State the purpose of the eyelids.
2. Define medial and lateral angles, palpebral fissure, conjunctiva, conjunctival sac, tarsal plates, and their associated glands.
3. Locate, state the nerve supply, and the function of the levator palpebral superioris and orbicularis oculi muscle.

D. Describe the lacrimal apparatus.

E. Locate, state the nerve supply, and the function of the muscles that move the eyeball.

F. Describe the anatomy of the eye by locating and stating the functions of the following:

sclera	ciliary body	optic disc
cornea	suspensory ligaments	anterior and posterior cavity

choroid	retina	anterior and posterior chamber
iris	rods and cones	aqueous humor
pupil	macula	vitreous humor
lens	fovea centralis	optic nerve

*G. Define the following

ptosis	astigmatism
glaucoma	conjunctivitis
myopia	accommodation
hypermetropia	refraction

H. Successfully complete the following optional exercises:

near point of accommodation	two-point discrimination
visual acuity	location of tastebuds
color blindness	examination of retina
Rinne and Weber hearing test	examination of tympanic membrane
localization	olfactory nerve testing

***will not be covered in class**

VII **Anatomy of the Skeleton Lab**

Upon completion of a study of the skeleton, the student should be able to correctly identify the following on a timed laboratory practical examination.

A. Be familiar with the following terms as they apply to skeletal parts.

condyle	trochanter	fossa	spine
crest	tubercle	sinus	foramen
head	tuberosity	meatus	

B. Identify any bone as a member of the axial or appendicular skeleton.

C. Given a human skull, accurately identify the following bones and their details:

1. frontal bone
   a. frontal sinus
   b. supraoptic foramen
2. parietal bone
3. temporal bone
   a. mastoid process
   b. external auditory meatus
   c. zygomatic process
   d. zygomatic arch
   e. mandibular fossa
   f. styloid process
   g. carotid canal
   h. jugular foramen
4. occipital bone
   a. foramen magnum
   b. occipital condyles
   c. occiput (external occipital protuberance)
5. sphenoid
   a. sella turcica
   b. optic foramen
   c. sphenoid sinus
   c. foramen ovali
   d. foramen rotundum
6. ethmoid
   a. cribriform plate
   b. concha
   d. ethmoid sinus (air cells)
   e. perpendicular plate

c. crista galli

7. maxillary bone (maxilla)
   a. alveolar process
   b. maxillary sinus
   c. infraorbital foramen
8. zygomatic
   a. temporal process
   b. zygomatic arch
9. lacrimal
10. palatine
11. nasal
12. vomer
13. mandible
    a. body
    b. condyloid (condylar) process
    c. alveolar process
    d. coronoid process
    e. ramus
    f. angle
    g. body
    h. mental foramen
    i. mandibular foramen
14. hyoid
15. other structures
    a. orbits (superior and inferior orbital fissures)
    b. sagittal suture
    c. coronal suture
    d. lambdoidal suture
    e. squamosal suture

D. If given a vertebra, identify its basic parts:
   spinous process
   transverse process
   superior and inferior articular process/facets
   pedicle
   vertebral foramen
   body
   odontoid process (dens) (axis only)
   demifacet (thoracic only)
   transverse foramen (cervical only)
   intervertebral foramen
   lamina

E. Identify the intervertebral disc and define its parts; annulus fibrosus and nucleus pulposus (p. 269-270). Discuss disc problems (p. 276)

F. List the types and number of vertebrae, according to their locations. If given an individual vertebrae, be able to identify if it is a cervical, thoracic, lumbar, or sacral.

G. Identify the first two cervical vertebrae as the atlas and the axis and state how each allows head movement.

H. If given a sternum, differentiate between its manubrium, body, xiphoid process, sternal (jugular) notch, and sternal angle

I. State the number of pairs of and the difference between true, false, and floating ribs and identify the following parts: body or shaft, head, neck, tubercle, angle, costal grove, costal cartilages, and intercostal spaces.

J. Identify the following bones of the pectoral girdle and their details:
   1. clavicle
      a. sternal end
      b. acromial end
   2. scapula
      a. supraspinous fossa
      b. infraspinous fossa
      c. subscapular fossa
      d. glenoid fossa
      e. acromion process
      f. spine
      g. coracoid process
      h. superior and inferior angle
      i. body

K. Identify the following bones of the upper extremities and their details:

1. humerus
   a. head
   b. greater tubercle
   c. lesser tubercle
   d. medial epicondyles
   e. lateral epicondyles
   f. capitulum
   g. trochlear
   h. olecranon fossa
   i. coronoid fossa
   j. bicipital (intertubercular) grove
   k. anatomical/surgical neck
2. ulna
   a. olecranon process
   b. semilunar (trochlear) notch
   c. coronoid process
   d. radial notch
   e. styloid process
3. radius
   a. styloid process
   b. ulnar notch
   c. head
4. carpals: scaphoid, lunate, triquetrium, pisiform, trapezium, trapezoid, capitate, hamate (Also define carpal tunnel and carpal tunnel syndrome)
5. metacarpals: I - V
6. phalanges: proximal, middle, distal

L. Identify the pair of coxal (innominant), that as hip bones, form the pelvic girdle. Identify the areas of the coxal bone that are the ilium, ishium, and pubis. Also identify the following features:

1. iliac crest
2. pubic symphysis
3. anterior superior iliac spine
4. greater sciatic notch
5. ischial tuberosity
6. acetabulum
7. obturator foramen
8. greater or false pelvis
9. lesser or true pelvis
10. pelvic brim
11. posterior superior iliac spine
12. ischial spine
13. pelvic inlet

M. Identify the following bones of the lower extremities and their details:

1. femur
   a. head
   b. neck
   c. greater & lesser trochanter
   d. shaft
   e. medial & lateral condyles
   f. medial & lateral epicondyle
2. patella
3. tibia
   a. medial and lateral condyles
   b. medial malleolus
   c. tibial tuberosity
4. fibula
   a. head
   b. lateral malleolus
5. tarsals: calcaneus, talus, navicular, cuboid, cuneiforms (first, second, third)
6. metatarsals: I - V
7. phalanges: proximal, middle, distal

VIII. **Dissection of Major Skeletal Muscles of the Cat**

Upon completion of dissection, the students should be able to correctly identify the following muscles on a dissected cat, a diagram of human musculature, and/or upon themselves on a laboratory practical exam.

A. Superficial Thoracic Muscles:

1. pectoralis major
2. pectoralis minor

B. Abdominal wall muscles:
1. external abdominal oblique
2. internal abdominal oblique
3. linea alba (a line of connective tissue on midline where the aponeuroses of the above muscles fuse together
4. transversus abdominis
5. rectus abdominis

C. Deep Thoracic muscles:
1. serratus ventralis (anterior)
2. scalenus ("the scalenes)
3. external intercostals
4. internal intercostals

D. Superficial back muscles:
1. clavotrapezium
2. clavobrachialis
3. acromiotrapezius
4. spinotrapezius
5. latissimus dorsi

E. Deep back muscles:
1. multifidus spinae
2. longissimus dorsi
3. spinalis dorsi

F. Muscles of the neck:
1. sternomastoid
2. cleidomastoid
3. sternohyoid
4. sternothyroid
5. cricothyroid
6. digastric
7. mylohyoid
8. thyrohyoid

G. Deep muscles of the neck and back:
1. rhomboideus minor (cervicis)
2. rhomboideus major (thoracis)
3. splenius

H. Muscles of the head:
1. masseter
2. temporalis

I. Shoulder muscles:
1. supraspinatus*
2. infraspinatus*
3. teres major*
4. subscapularis*
5. acromiodeltoid
6. spinodeltoid
7. teres minor

*"rotator cuff" muscles

J. Muscles of the upper arm (brachium)
1. biceps brachii
2. triceps brachii
3. brachialis

K. Superficial muscles of the medial side of the thigh:
1. sartorius
2. gracilis

L. Superficial muscles of the lateral side of the thigh:
1. biceps femoris☒
2. tensor fascia latae

M. Deep muscles of the medial side of the thigh:
1. pectineus
2. adductor longus
3. adductor femoris
4. psoas major
5. semimembranosus☒
6. semitendinosus☒

☒"hamstring" muscles

N. Deep muscles of the lateral side of the thigh
1. vastus medialis●
4. vastus intermedius●

2. rectus femoris●
3. vastus lateralis●
5. semimembranosus (deep surface)
6. semitendinosus (deep surface)

●"quadraceps (quads) femoris" group

O. Muscles of the calf
1. tibialis anterior (cranialis)
2. gastrocnemius
3. soleus

P. Muscles of the hip
1. gluteus maximus◆
2. gluteus medius

◆Note the position of the sciatic nerve deep to the belly of this muscle

TOPICAL OUTLINE - BIO 211 - HUMAN ANATOMY & PHYSIOLOGY I

I. Review of chemical organization of Life
A. Matter and energy
l. Elements of life
2. Atoms, ions, and molecules
3. Chemical bonding
B. Chemical makeup of life
1. Water, solutions, and measurement
2. Biological organic compounds
C. Chemical reactions
1. Types of metabolic reactions
2. ATP
3. Role of enzymes and nucleic acids

II. Review of cellular structure and organization
A. Cell theory
B. Cellular structure and function
1. Organelles and inclusions
2. Respiration
3. Movement
4. Mitosis

III. Organization of the Human Body
A. Structural interrelationships
B. Homeostasis and feedback regulation
C. Respiration
D. Body cavities
1. Dorsal cavity
a. subdivisions
b. contents
c. meninges
2. Ventral cavity
a. subdivisions
b. contents

c. pleura and peritoneum

E. Anatomical directions, planes, and regions

IV. Tissues
- A. Definition and types of tissues
- B. Organization of epithelium
- C. Organization of connective
- D. Muscle and nervous

V. Skin as an example of an organ
- A. Functions of skin
- B. Epidermal and dermal structures

VI. Fluid compartment organization
- A. Fluid compartments
  1. Definitions and quantities
  2. Chemical compositions
  3. Intake and output
- B. Cell membrane physiology
  1. Molecular structure
  2. Transport across cell membranes
  3. Membrane electrical potentials
- C. Capillary dynamics
  1. Structure
  2. Pressures
- D. Lymphatic system

VII. Skeletal system
- A. Organization and general structure
- B. Ossification
- C. Vertebral column curvatures
- D. Joint organization and movements
- E. Anatomy of the skeleton

VIII. Nervous system
- A. Overall construction, organization and terminology
  1. Neurons
  2. Nerves
- B. Nerve impulses
- C. Synapses
- D. Central nervous system
  1. Brain
  2. Spinal cord
  3. Meninges
  4. Cerebrospinal fluid
- E. Peripheral nervous system
  1. Cranial nerves
  2. Spinal nerves and nerve plexus
  3. Major peripheral nerves
  5. Reflex arcs
  6. Autonomic nervous system
  7. Eye and ear and other special

4. Sense receptors senses

IX. Muscular system
   A. Organization, structure, and characteristics of muscle tissue
   B. Anatomy of a typical skeletal muscle
   C. Microstructure of skeletal muscle fibers
   D. Physiology of contraction
   E. Location of major skeletal muscles

Cover Illustration:

Dream Anatomy, an online exhibit by the U.S. National Library of Medicine about the history of anatomical imagery, from 1500 to the present:

> The interior of our bodies is hidden to us. What happens beneath the skin is mysterious, fearful, amazing. In antiquity, the body's internal structure was the subject of speculation, fantasy, and some study, but there were few efforts to represent it in pictures. The invention of the printing press in the 15th century-and the cascade of print technologies that followed-helped to inspire a new spectacular science of anatomy, and new spectacular visions of the body. Anatomical imagery proliferated, detailed and informative but also whimsical, surreal, beautiful, and grotesque — a dream anatomy that reveals as much about the outer world as it does the inner self.
>
> Over the centuries anatomy has become a visual vocabulary of realism. We regard the anatomical body as our inner reality, a medium through which we imagine society, culture and the human condition.

www.unbsj.ca/.../jones/mt/archives/c17th/

TENTATIVE ACADEMIC SCHEDULE
Fall Semester, 2008

Lecture: Tuesday and Thursday, 12:30 - 1:55, room 216

Sept. 2: Introduction to the course
Sept. 4: Body cavities and their linings

Sept. 9: Pretest over Unit I given in lab/tissues
Sept. 11: Pretest over Unit I given in lab/tissues

Sept. 16: tissues
Sept. 18: Skin

Sept. 23: Fluid compartments
Sept. 25: Fluids/cell membranes

Sept. 30: Diffusion/osmosis
Oct. 2: Carrier and vesicular transport

Oct. 7: **Exam #1**
Oct. 9: Capillary exchange

Oct. 14: Capillary exchange/lymphatics
Oct. 16: Skeletal structure

Oct. 21: Joints
Oct. 23: Nervous Tissue

****Last day to withdraw; Dec. 15

Oct. 28: Nervous tissue/membrane potentials
Oct. 30: Nerve impulse

Nov. 4: Polarization/refractoryness/synapse
Nov. 6: Synaptic transmission

Nov. 11: Neurotransmitters/CNS layout
Nov. 13: **Exam #2**

Nov. 18: Brain
Nov. 20: Spinal cord

Nov. 25: Meninges and CSF
Nov. 27: No classes: Thanksgiving Break

Dec. 2: reflex arc
Nov. 4: Cranial nerves
****
Dec. 9 Spinal and peripheral nerves
Dec. 11: Autonomic nervous system

Dec. 16: Muscle tissue
Dec. 18: Muscle contraction

Dec. 23: **Exam #3**

TOPIC ORDER AND TEXTBOOK READING

Unit 1: Review of Chemical and Cellular Organization; *Martini: chapters 2 & 3 (omit 70-72, 89-100);
Unit 2: Biological organization; Martini: pp. 2 - 16, 22 - 25, 930 - 946;
Unit 3: Tissues; Martini: chapter 4;
Unit 4: Skin; Martini: chapter 5;
Unit 5: Organization and communication of fluid compartments; Martini: pp. 1010 - 1017, 67 - 72, 89 – 100, 724 – 727, 734 - 737, 777 - 781, 783 - 788;
Unit 6: Skeletal system; Martini: chapters 6 - 9;
Unit 7: Nervous system; Martini: chapters 12 - 16;
Unit 8: Muscular system; Martini: chapters10 - 11;

**Fundamentals of Anatomy & Physiology*, by Martini and Nath, Benjamin-Cummings Publishers, 8th ed.

Tentative Academic Schedule - Lab
Fall Semester, 2008
Tuesday or Thursday - 9:00 - 12:00, Rm. 214

Tuesday Lab

Date	**Activity**
Sept. 2:	Lecture: Unit II: Biological Organization
Sept. 9:	**Pre-test** over Unit I objectives (see lecture schedule) followed by Anatomical Terminology exercise; (pp. 15 –19 and lab handout)
Sept. 16:	**Quiz** over anatomical terminology followed by Cell Structure and Mitosis lab exercise (chapter 3 and lab handout)
Sept 23:	Tissue anatomy; microscopic examination: (chapter 4 and lab handout)
Sept. 30:	Muscle and Nervous tissue lecture followed by Tissue anatomy (con't.)
Oct. 7:	Diffusion and osmosis lab experiment (chapter 3 and lab handout)
Oct. 14:	**Lab practical exam** over tissues; Special senses - ear lab; chp. 17, *Applications Manual*: pp. 104-106 and handouts
Oct. 21:	Special senses (con't) - eye lab (with dissection*) chp. 17 and handout
Oct. 28:	**Quiz** over eye/ear anatomy: Begin study of bones; chp. 6-9
Nov. 4:	Skeletal anatomy study (con't)
Nov. 11:	Cat muscle dissection*; (Muscles chapter in Gilbert and chp 11 in Martini)
Nov. 18:	**Lab practical exam** over bones; followed by muscle dissection* (con't)
Nov. 25:	Lab will not be in session
Dec. 2:	Muscle dissection* (con't)
Dec. 9:	**Lab practical exam** over muscles
Dec. 16:	Lecture over Unit VIII: Myology lecture objectives

Thursday Lab

Date	**Activity**
Sept. 4:	Lecture: Unit II: Biological Organization
Sept. 11:	**Pre-test** over Unit I objectives (see lecture schedule) followed by Anatomical Terminology; (pp. 15 -19 and lab handout)
Sept. 18:	**Quiz** over anatomical terminology followed by: Cell Structure and Mitosis lab exercise (chapter 3 and lab handout)
Sept. 25:	Tissue anatomy; microscopic examination: (chapter 4 and lab handout)
Oct. 2:	Muscle and Nervous tissue lecture followed by Tissue anatomy (con't.)
Oct. 9:	Diffusion and osmosis lab experiment, (chapter 3 and lab handout)
Oct. 16:	**Lab practical exam** over tissues; Special senses - ear lab; chp. 17, *Applications Manual*: pp. 104-106 and handout
Oct 23:	Special senses (con't) - eye lab (with dissection*) chp. 17 and handout
Oct. 30:	**Quiz** over eye/ear anatomy: Begin study of bones; chp. 6-9
Nov. 6:	Skeletal anatomy study (con't)
Nov. 13:	Cat muscle dissection*; (Muscles chapter in Gilbert and chp 11 in Martini)
Nov. 20:	**Lab practical exam** over bones followed by Muscle dissection* (con't)
Nov. 27:	No classes: Thanksgiving Break
Dec. 4:	Muscle dissection* (con't)
Dec. 11:	**Lab practical exam** over muscles
Dec. 18:	Lecture over Unit VIII: Myology lecture objectives

*dissection tool required; gloves recommended
All readings are from Martini's *Fund. of Anatomy/Physiology* unless stated otherwise

LAB HOURS - ROOM 204

FALL SEMESTER - 2008

(Subject to change after the science department moves to campus on New London Tpk)

MONDAY: 9:30AM - 9:30 PM
TUESDAY: 9:00 AM - 9:30 PM
WEDNESDAY: 9:30 AM - 9:30 PM
THURSDAY: 9:00 AM - 9:30 PM
FRIDAY: 8:00 AM - 12:00 PM
(Friday afternoon by arrangement)

LAB USAGE

1. All students enrolled in General Biology, Human Biology, Anatomy & Physiology, Microbiology, and Genetics are welcome to use the lab during the lab hours posted above.
2. If you plan on using the lab when another instructor has a class in session, please check with that instructor at the beginning of their class. (refer to the class schedule below)
3. If there is another class in session, please work quietly at the back of the room.
4. The lab may be closed during certain times of the semester for testing purposes. These times will be posted on the door, as needed.
5. Anatomy and Physiology students cannot dissect during open lab times when there is a non-dissection class in session (gen. biology and human biology)

ROOM 214 CLASS SCHEDULE

Monday	Tuesday	Wednesday	Thursday	Friday
	9:00 - 12:00 A&P I Kirkpatrick		9:00 – 12:00 A&P I Kirkpatrick	8:00-11:00 A&P I Skiba
1:00 - 4:00 A&P I Kirkpatrick		1:00 - 4:00 A&P I Kirkpatrick	1:00 - 4:00 Gen. Biology I Samuelson	
6:30 - 9:30 Human Biology Dopirak		6:30 – 9:30 A&P I Skiba	6:30 - 9:30 Gen Biology I Samuelson	