

**BIOL 2170 Introduction to Human Pathophysiology**  
**Fall Semester 2005**  
**Southern Utah University**

**Instructor:** Dr. Rachel Smetanka  
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**Office Hours:** Monday/Wednesday 2:30-4:30, Thursday 12:30-2, or by appointment

**Meetings:** Lecture: Tuesday and Thursday 2:30-3:50 pm, SC 114  
Recitation/Problem Session (optional): Tuesday 4-6 pm SC 016

**Required Text:** *Pathophysiology*, Copstead and Banasik, 3<sup>rd</sup> Edition.

**On-Line Information:** Via WebCT. WebCT will be used extensively in this course. Exam dates, problem sets, homework assignments, supplemental study materials, and grades can be found by checking WebCT on a regular basis. Announcements about readings and schedule changes will be posted regularly. Occasionally, quizzes will be administered through WebCT.

**Course Description:** A clinically-oriented study of human physiology and the alterations in body functions that underlie diseases in humans. It serves as a foundation for courses in the Nursing Program. Prerequisites: Human Anatomy and Human Physiology

**General Course Policies:** Because all students have already had a human physiology course in some capacity, students are expected to review the systems BEFORE lecture so that our discussion may begin at higher level without reviewing all of the basics. Nevertheless, normal physiology will be reviewed in class to ensure mutual understanding. Considerable material will be covered by both the text, other assigned reading materials, and in lecture. A certificate signed by a certified medical doctor or a documented family emergency are the ONLY acceptable excuses for missing an exam, unless prior arrangements are made.

**Your Responsibilities as a Student:**

- *Be courteous! Show up to class on time and turn off cell phones, pagers etc. during class.*
- *Academic dishonesty will not be tolerated.* You are expected to have read and understood the current student handbook (published by Student Services) regarding student responsibilities for information about what constitutes acceptable on-campus behavior. All exams and assignment requirements must be completed independently. Any plagiarism of materials used to complete assignments will not be tolerated. If you have been determined to be dishonest in your completion of any of the course requirements, you will receive a zero for that work and depending on the extent of the dishonesty, may fail the course and may receive further action from the university.

<b>Grading:</b>	Lecture Exams:	(3 x 100 pt)	300 points
	Final Exam (cumulative):	(1 x 150 pt)	150 points
	Quizzes (in class and online):	(10 x 15 pt)	150 points
	Other Assignments:	TBA	100 points
			<hr/>
			700 points

There will be 3 in class lecture exams and one final exam. Lecture exams will be worth 100 points each toward total points possible for the course (except Final exam worth 150 points). Students are allowed to replace the lowest exam score with the final exam score if final exam score (based out of 100 points) is

higher than one previous exam score. There will also be a weekly quiz either taken in lecture or assigned on WebCT except during those weeks which contain a lecture exam or Thanksgiving Break. The 1 lowest quiz score can be dropped or a student can elect not to take one quiz and have all completed quizzes count toward total points possible for the course. Problem sets will be assigned/available for each section of material covered. Problem sets are to be used for supplemental study material and students are encouraged to complete problems as a study guide for topics covered in class. Tuesday afternoon from 4-6 pm the instructor will be present to assist and answer questions from the problem sets. This time can also be used to review topics that students are having difficulty with. Students are encouraged to attend weekly.

Grades will be assigned based on the following scale:

A= 93.34-100%	C= 73.34-76.66%
A-= 90-93.33%	C-= 70-73.33%
B+= 86.67-89.99%	D+= 66.67-69.9%
B= 83.34-86.66%	D= 63.34-66.66%
B-= 80-83.33%	D-= 60-63.3%
C+= 76.67-79.99%	F= less than 60%

**Exam Schedule: (put these on your calendars NOW!!):**

**All Lecture Exams Given in SC 114 at 2:30 pm**

Lecture Exam 1: Tuesday, September 20

Lecture Exam 2: Tuesday, October 18

Lecture Exam 3: Tuesday November 15

**\*\*Final Exam: Friday, December 16, 3-4:50 pm\*\***

**American Disabilities Act Statement:** Students with medical, psychological, learning, or other disabilities desiring academic adjustments, accommodations, or auxiliary aids will need to contact the Southern Utah University Coordinator of Services for Students with Disabilities (SSD) in Room 206F of the Sharwan Smith Center, phone (435) 865-8022. SSD determines eligibility for and authorizes the provision of services.

*It is the student's responsibility to provide documentation from the Office of Disability Services to the lecture instructor to ensure that appropriate arrangements are made.*

## Tentative Lecture Schedule Fall 2005:

WEEK# - Tuesday	LECTURE TOPIC All readings from Copstead and Banasik 3 <sup>rd</sup> Edition
1 – Aug 30	<b>Introduction and General Concepts, Start Immunology Ch 1-2, 8-12</b>
2 – Sept 6	<b>Immunology and Cancer Ch 8-12, 7</b>
3 – Sept 13	<b>Finish Cancer, Nervous System Ch 7, 43-45</b>
4 – Sept 20	<b>Nervous System Ch 43-45</b>
5 – Sept 27	<b>Start Neuromuscular Junction, Musculoskeletal Physiology Ch 50-52</b>
6 – Oct 4	<b>Finish Musculoskeletal Ch 50-52</b>
7 – Oct 11	<b>Start Cardiovascular, hematology and lymphatics Ch 41-42, 17-18</b>
8 – Oct 18	<b>Cardiovascular, hematology and lymphatics Ch 17-19, 13-16</b>
9 – Oct 25	<b>Finish Cardiovascular, hematology and lymphatics, Start Respiratory Physiology Ch 13-16, 21-23</b>
10 – Nov 1	<b>Respiratory Physiology, Start Renal Physiology Ch 21-23, 26-29</b>
11 – Nov 8	<b>Renal Physiology Ch 26-29</b>
12 – Nov 15	<b>Renal Physiology, Start GI Physiology Ch 26-29, 35-38</b>
13 – Nov 22	<b>GI Physiology, Start Endocrinology (Thanksgiving Break) Ch 35-38, 39-41</b>
14 – Nov 29	<b>Endocrinology, Start Reproductive Physiology Ch 39-41, 30-34</b>
15 – Dec 6	<b>Reproductive Physiology, Special Senses (if time) Ch 30-34, 46-47</b>

**Learning Objectives for BIOL 2170:  
Introduction to Human Pathophysiology**

<p><b>General Concepts and Overview:</b> <b>Ch 1-3</b></p>	<ol style="list-style-type: none"> <li>1. Review concepts of cell structure and function related to metabolism, communication, transportation, and electrical activity of excitable cells.</li> <li>2. Review homeostasis, control systems, gain, and adaptation</li> </ol>
<p><b>Immunology and Cancer:</b> <b>Ch 8-12, 7</b></p>	<ol style="list-style-type: none"> <li>1. Review role of host, types of pathogens, transmission, components of the immune response, and inflammation.</li> <li>2. Relate each sign of inflammation with each phase of response to injury.</li> <li>3. Compare and contrast autoimmunity and other excessive immune responses with immunodeficiency disorders. Include immune mechanisms and signaling pathways.</li> <li>4. Evaluate steps in process of immunodeficiency associated with AIDS and account for stage-related symptoms.</li> <li>5. Discuss genetic basis of certain cancers and identify mechanisms targeted by latest treatment options.</li> </ol>
<p><b>Nervous System</b> <b>Ch 43-45, 48-49</b></p>	<ol style="list-style-type: none"> <li>1. Review structures and pathways associated with neural communication, locations and types of receptors and electrical activity of neurons.</li> <li>2. Relate cellular communication mechanisms employed by the nervous system to acute and chronic changes in brain function.</li> <li>3. Based on known neural communication pathways, evaluate usefulness of current and future treatment options for pathologies such as Parkinsons, Huntingtons, reperfusion injury, hematoma, and acute infections.</li> <li>4. Review mechanisms of signal transmission at the neuromuscular junction in the excitation of skeletal muscle.</li> <li>5. Use the structure and mechanisms of neuromuscular excitation to discuss inability to sufficient excite skeletal muscle. As examples, explain muscular fatigue, myasthenia gravis, and botulism.</li> </ol>

<p><b>Musculoskeletal Physiology:</b> <b>Ch 50-52</b></p>	<ol style="list-style-type: none"> <li>1. Review basic structure of skeletal muscle. Compare and contrast characteristics of skeletal muscle with that of smooth and cardiac muscles.</li> <li>2. Discuss possible alterations at the neuromuscular junction that may account for muscular weakness, overexcitation, or paralysis.</li> <li>3. Compare and contrast major muscle metabolic disorders: cause, symptoms, and treatment.</li> <li>4. Discuss musculoskeletal disorders that are associated with autoimmune reactions.</li> <li>5. Evaluate acute and chronic injuries of the movable joints.</li> <li>6. Discuss disorders of bone formation, bone infections, and necroses.</li> <li>7. Evaluate the mechanism by which treatments such as steroid therapy and chemotherapy may alter joint function.</li> </ol>
<p><b>Cardiac Physiology:</b> <b>Ch 17-19</b></p>	<ol style="list-style-type: none"> <li>1. Review structure and function of cardiac muscle and describe the intrinsic conduction system of the heart and pattern of blood flow through the heart and great vessels.</li> <li>2. Describe the purpose of heart valves and the consequences of acute and chronic valve disorders</li> <li>3. Define arrhythmia and give examples of mild and severe types of arrhythmias. Use this definition to explain any associated symptoms.</li> <li>4. Compare and contrast acute and chronic treatments for heart failure and relate the symptoms of right and left side heart failure to inappropriate blood pressures and blood flow dynamics.</li> </ol>
<p><b>Circulation, Hematology, and Lymphatics</b> <b>Ch 13-16</b></p>	<ol style="list-style-type: none"> <li>1. Review blood pressure and blood flow dynamics, circulatory control mechanisms, constituents of blood and the major functions of the lymphatic vessels.</li> <li>2. Compare and contrast systemic and local regulation of vascular tone and how this is altered by cardiovascular disease, aging, and diabetes mellitus.</li> <li>3. Describe the process of atherosclerosis, its influence on regulation of blood pressure, risk factors for development of coronary heart disease, and possible treatment options.</li> <li>4. Compare and contrast hyper- and hypo- coagulation states and possible causes for each.</li> <li>5. Discuss local control of lymph flow and blood pressure regulation and hormonal influences of insufficient lymph activity.</li> </ol>

<p><b>Respiratory Physiology: Ch 21-23</b></p>	<ol style="list-style-type: none"> <li>1. List the structures and functions of the respiratory system and describe factors that determine lung volume. Define the factors that determine the airflow rate into and out of the lungs. Be able to explain the concept of dynamic airway compression. Define the factors that determine gas exchange between an alveolus and a pulmonary capillary.</li> <li>2. Explain the consequences of inappropriate ventilation/perfusion matching and how these imbalances are corrected.</li> <li>3. Compare and contrast obstructive and restrictive pulmonary disorders.</li> <li>4. Discuss the consequences of hypo- and hyper-ventilatory states and their effect on acid/base balance, breathing stimulus, and partial pressure of arterial gases.</li> </ol>
<p><b>Renal Physiology Ch 26-29</b></p>	<ol style="list-style-type: none"> <li>1. Review major kidney processes: filtration, reabsorption, secretion. Review structure and function of urinary tract. 2. Review major hormones controlling short and long term regulation of fluid balance and discuss how these hormones are altered by acute and chronic renal disorders.</li> <li>2. Evaluate the effect of hypertension, renal stenosis, and chronic diabetes mellitus on the long term regulation of plasma volume.</li> <li>3. Compare and contrast possible diuretic combinations used for the treatment of edema. Justify acceptable combinations based on mechanism of action, local of action, and patient history.</li> <li>4. Discuss diagnostic characteristics and possible treatments of acute urinary tract infections.</li> </ol>
<p><b>Gastrointestinal Physiology: Ch 35-38</b></p>	<ol style="list-style-type: none"> <li>1. Review major structure and function of GI organs as well as accessory organs</li> <li>2. Discuss hormonal control of digestion and how alterations in GI hormones alter digestion or foodstuffs as well as gastric motility.</li> <li>3. Compare and contrast major inflammatory disorders of the GI tract.</li> <li>4. Differentiate between the three major categories of Hepatitis (A, B, C)</li> <li>5. Evaluate the major GI motility disorders and current treatment practices for these disorders.</li> <li>6. Discuss major conditions associated with GI malabsorption and their mechanisms.</li> </ol>

<b>Endocrinology: Ch 39-42</b>	<ol style="list-style-type: none"> <li>1. Review major structures and hormones of the central and peripheral endocrine organs.</li> <li>2. Use this knowledge to describe disorders of hyper- and hypo-secretion of major endocrine organs. Explain the basis of symptoms associated with these secretion disorders.</li> <li>3. Differentiate between severity and treatment success of acute versus chronic secretion disorders.</li> <li>4. Compare and contrast causes, symptoms, and treatment options for type 1 and type 2 diabetes mellitus.</li> </ol>
<b>Reproductive Physiology: Ch 30-34</b>	<ol style="list-style-type: none"> <li>1. Review major components of male and female reproductive systems.</li> <li>2. Compare and contrast congenital disorders of male and female reproductive organs.</li> <li>2. Evaluate major disorders of male reproduction that are associated with hormonal etiologies.</li> <li>3. Evaluate major disorders of female reproduction that are associated with hormonal etiologies.</li> <li>4. Assess current practice in progression, diagnosis, and treatment of prostate cancer.</li> <li>5. Discuss major changes associated with a woman's response to pregnancy.</li> <li>6. Compare and contrast menstrual disorders and disorders of the breast.</li> </ol>
<b>Pain and the Special Senses: Ch 46-47</b>	<ol style="list-style-type: none"> <li>1. Review the structure and function of pathways of vision, taste, hearing and olfaction.</li> <li>2. Compare and contrast symptoms and treatments of external and internal infections of the ear.</li> <li>3. Evaluate the mechanisms associated with corrective lens treatment for astigmatism, and near and far sightedness</li> <li>4. Assess current practices and outcomes for lens and corneal transplant.</li> <li>5. Compare and contrast the different types of macular degeneration.</li> </ol>