

**Introduction**

Biology 261 – Human Physiology – is designed for students intending to enter or already accepted into the Nursing program. It is NOT appropriate for pre dental, premedical or preveterinary students. Students with declared majors in biology, microbiology or environmental health will not get credit for taking this course. Furthermore, if you have already taken Biol 336, Biol 590 or Biol 436 the university will **NOT** give you credit for this class.

**Prerequisites**

Previous college courses in Biology (Biol 100 or 201A), Human Anatomy (Biol 212), and Organic Chemistry (Chem 102) or General Chemistry (Chem 100) AND Organic Chemistry (Chem 130) are required. (Note: Only Organic Chemistry (Chem 102 or 130) can be taken concurrently.) **PROOF OF THESE CLASSES ARE REQUIRED AND IF YOU CANNOT PROVIDE PROOF OF COMPLETION - YOU WILL BE DROPPED FROM THE CLASS.**

**Learning Objectives for Bio 261**

This is an **INTENSIVE** class designed for nursing students to introduce them to and give them a strong and comprehensive foundation of physiology. This will give the students a solid base to build upon with their remaining nursing courses. It is assumed that the students will enter the course with a thorough working knowledge of human anatomy and an understanding of basic chemistry principles, including the fundamentals of acid/base chemistry.

The course will review the basic concepts of biomolecules and cell biology with an emphasis on what is required for cellular “life” to understand the basic driving principle of physiology - homeostasis. The student will understand the importance of defining basic physical properties of molecules to be able to understand how molecules will be transported into and out of cells. We will then progress to understanding the nervous system and learn the details of neuronal transmission of signals and understand how the nervous system both receives information and initiates response actions throughout the body. This will include a thorough integration of how skeletal muscle cells are activated by neurons. The skeletal muscle system will be used as a foundation for introduction and comparison to the other types of muscle - smooth muscle and cardiac muscle – and their activation and control by the body. At the subcellular/cellular level we will also examine the composition of blood and outline a basis for clinical examination of blood and the students will gain an overview of the immune system, including a very basic understanding of antigens and antibodies and B-cell and T-cell function.

At the system level, we will cover the cardiovascular, respiratory, renal, digestive and endocrine systems, discussing both a review of anatomy (where appropriate) and learning the major specifics of function with emphasis as to how the systems help to regulate homeostasis. Finally, students will learn about both the male and female reproductive systems. Learning about how the male and female structures are formed, and emphasis on the complex hormonal control and coordination of both systems.

Biology 261 is an **EXTREMELY INTENSIVE AND DIFFICULT** course, which will move rapidly through the functions, mechanisms, and interrelationships of the human organ systems. This is a **difficult** and **time-consuming** course. To do well in this course, you should keep up with the material on a daily basis. Attend **all** lectures, take notes, go over your notes while the lecture is fresh in your mind, and use the text to fill in gaps and correct ambiguities. Be sure you **understand the material**; memorizing facts without being able to integrate the facts and overall concepts will not help you pass the difficult exams. **One of the best ways to study for a class such as physiology is to teach what you have learned to a fellow classmate or friend, this often helps you to see areas that you thought you understood but really haven't mastered.**

Supplemental material and grades will all be posted on **Blackboard**.

### **Grading**

The lecture portion of the course will contain three exams (100 points each) and one comprehensive final (200 points). Each exam will have both fill in the blanks and multiple choice questions. The laboratory portion of the course will be graded on quizzes, lab reports and assignments (~200 points total). Your lecture grade will count for ~75% and your laboratory grade for ~25% of your final course grade. The course grade will be determined by the percentage of the total point score earned, and will be 85-100% = A, 70-84% = B, 50-69% = C, 35-49% = D, 35% & less = F.

**MAKE-UP POLICY: NO LAB OR EXAM POINTS CAN BE MADE UP WITHOUT DOCUMENTATION (DOCUMENTATION DOES NOT INCLUDE E-MAILS TO ME).** If you are ill or have suffered an injury **AND** you can provide a note from your physician, **AND** you either contact me or leave a message with the department office (LS 104, 594-6767) no later than the day of the lab/exam or before the next lab period, a make-up lab exercise/exam (style to be determined by the instructor) can be arranged to be given at the instructor's convenience **TO BE DONE WITHIN THE WEEK FOLLOWING THE EXERCISE/EXAM. ABSOLUTELY NO EXCEPTIONS - TO BE CONSIDERED FOR MAKE-UP POINTS - I WILL REQUIRE DOCUMENTATION FOR ANYTHING THAT IS MISSED (ACCEPTABLE DOCUMENTATION INCLUDES: PHYSICIANS NOTE, COPY OF HOSPITAL ADMITTANCE FORM, ETC.)!**

**Any wet-lab we perform ABSOLUTELY CANNOT be made up.** There are no make-up labs; however, many of the lab simulations can be completed on a computer at home. If you anticipate missing a lab for a legitimate reason (with documentation), see me at least a week in advance. If you are ill on the day of a lab please also contact me no later than the day of the lab.

If you miss an exam, it will be averaged into your semester grade as a zero. If (1) you have an acceptable reason (accompanied by a note from your physician) for missing an exam **and** (2) you either contact me or leave a message with the department office (LS 104, 594-6767) no later than the day of the exam, a make-up exam (style to be determined by the instructor) will be given at the instructor's convenience. DOCUMENTATION IS ABSOLUTELY REQUIRED - NO EXCEPTIONS!

**IMPORTANT NOTE: ATTENDANCE OF LABS IS MANDATORY!**  
**ATTENDANCE IS TAKEN AT EACH MEETING, AND MISSING MORE THAN ONE LAB WITHOUT A LEGITIMATE EXCUSE WILL RESULT IN A FAILING GRADE.**

**Required Texts** (All available at Aztec Book Store)

1. *Fundamentals of Physiology - A Human Perspective, 3rd Edition* - by L. Sherwood
2. *Laboratory Exercises for Human Physiology* – by K.E. Norgard-Sumnicht, C.L. Brandt, G.A. Sabbadini & K. Krown
3. *PhysioEx 8.0 For Human Physiology – Laboratory Simulations in Physiology* – by T. Stabler, L. Smith, G. Peterson & A. Lokuta

## SYLLABUS FOR FALL 2009

Dr. Karin Norgard-Sumnicht - Office (South) LS 346, E-mail: knorgard@sciences.sdsu.edu

Office Hours: Available for appointments only. Appointments must be made at least one or two days in advance. And must be confirmed by e-mail.

Date	Topic	Reading: Sherwood 3rd Ed.
Sept 1	Homeostasis & Biomolecules (cont.)	1-15; A3-A18
Lab	Notebooks, Computers, Graphs & Pulse and Blood Pressure	(N)* - Both Intro's & Ex 1
3	Cell Membrane Structure and Transport	19-21; 43-61
8	Proteins, Enzyme Function & Cellular Metabolism	A14-A17; A19-A27; 26-32
<b>Write-Up</b> Lab	Diffusion, Osmosis, Cell Membrane Permeability	(N) - Ex 2
10	Intercellular Communication & Membrane Potentials	92-102; 61-66
15	Neurons and Action Potentials	109-114; 75-85
Lab	Enzyme Function & Scope & Transport	(N) - Ex 3, (S)** 1&8
17	Synaptic Transmission & Neuronal Integration	71-75; 85-92; Slides
22	Brain Structures/Functions	114-133
<b>Write-Up</b> Lab	<a href="#">Frog Sciatic Nerve Study</a>	(N) - Ex 4, (S) 3***
24	<b>EXAM I</b>	
29	Nervous System Organization & Reflexes	135-140; 145-165; 223-227
Lab	Human Reflexes & Receptors	(N) - Ex 5
Oct. 1	Skeletal Muscle Structure	203-213
6	Skeletal Muscle Mechanics & Metabolism	192-198; 213-223
<b>Write-Up</b> Lab	<a href="#">Frog Nerve-Skeletal Muscle Study</a>	(N) - Ex 6
8	Smooth and Cardiac Muscle	227-235
13	Blood Composition and Hemostasis	315-330
Lab	Blood Analysis Simulation	(S) 11 ( <b>BRING BOTH LAB MANUALS TO LAB</b> )
15	Autonomic & Somatic Nervous Systems	185-191
20	<b>EXAM II</b>	
Lab	<a href="#">Cardiac Muscle Demo &amp; Cardiac Simulation</a>	(N) - Ex 7, (S) 6 ( <b>BRING BOTH LAB MANUALS TO LAB</b> )
22	Cardiac System I	241-252; 255-264; 298-302
27	Cardiac System II	275-289; 265-270
Lab	CV Dynamics	(S) 5
29	Cardiac System III	289-297; 302-310
Nov. 3	Human ECG's & Disease Defense and Immunology	252-255; 355-358; 330-335
<b>Write-Up</b> Lab	Human Electrocardiograms	(N) - Ex 8
5	Respiratory System	365-383
10	Gas Exchange Mechanisms	383-399
Lab	Human Respiratory Study – No In Class Lab – At home simulation	(S) 7 & 10
12	Disease Defense and Immunology Wrap Up	335-355
17	<b>EXAM III</b>	
Lab	Human Response to Exercise	(N) - Ex 9
19	Digestive System & Fuel Metabolism - Pancreas	465-468; 481-493; 501-504; 560-572
24	Urinary System	443-446; 405-416; 427-429; 436-437
Lab	<b>NO LABS THIS WEEK (Nov 25<sup>th</sup> Furlough Day)</b>	
26	<b>THANKSGIVING</b>	
Dec. 1	Fluid Balance & Osmolarity Control	416-427; 429-436; 453-461
Lab	Kidney Simulation	(S) 9 & 10
3	Endocrine System Overview & Specific Glands	529-542; 547-573
8	Male Reproductive System	583-596
Lab	Endocrinology Simulation	(S) - Ex 4 ( <b>BRING BOTH LAB MANUALS TO LAB</b> )
10	Female Reproductive System	601-626

	<b>FINAL Tues. Dec 15<sup>th</sup> – 10:30-12:30</b>	

\* Norgard-Sumnicht et. al. - *Lab Exercises for Human Physiology*

\*\* Stabler et. al. - *PhysioEx 8.0 for Human Physiology - Laboratory Simulations in Physiology*

\*\*\*This one particular simulation will only be done if the frogs do not arrive for the class.

**IMPORTANT NOTE: AGAIN, ATTENDANCE OF LABS IS MANDATORY!  
ATTENDANCE IS TAKEN AT EACH MEETING, AND MISSING MORE THAN  
ONE LAB WITHOUT A LEGITIMATE EXCUSE WILL RESULT IN A FAILING  
GRADE.**