...learn wisdom in thy youth... *Alma 37:35*

College of Life Sciences
Department of Exercise Sciences

ExSc 400 sections 1 and 12 * *Functional Anatomy and Kinesiology*
Winter 2010 4 credit hours

Course Information

Instructor: Rike Mitchell, PhD, MSPT, MTC
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Required Text: Musculoskeletal Functional Anatomy, Myrer JW (BYU bookstore)

Suggested Reference Texts:

1. Abrahams PH, Marks SC and Hutchings RT. *McMinn's Color Atlas of Human Anatomy*. 5th ed. Edinburgh: Mosby; 2003
2. Netter FH. *Atlas o Human Anatomy.* 2nd ed. East Hanover, new Jersey: Norvartis; 1997
3. Gilroy, AM, MacPherson, BR, Ross, LM. *Atlas of Anatomy* 1st ed. New York: Thieme; 2008

Catalogue Course Description: Advanced examination of structure and function of skeletal, articular, muscular and peripheral nervous systems with clinical applications; cadaver lab included. **Prerequisite**: PDBio 220 or equivalent

Class Procedures:

- This course consists mostly of lecture, but also encompasses discussions and group presentations. Lab is mandatory and it will support you in accomplishing the intended learning outcomes.
- There will be 5 assignments, some to be done as homework, at least one to be completed as group project
- This is a difficult and challenging class with a lot of information. Try to be present at every class; this way you will be able to ask questions and avoid too much confusion later on
- I expect that you as a member of your group are prepared and able to contribute to the group in completing the assignments, helping others in your group with their learning and understanding of the concepts, and ultimately deepening your own learning

Total possible points for the class: 1050 (1000 as seen below + 5 extra assignments)

Breakdown of grades:

A 976 >	**B- 891 - 850**	**C+ 734 - 682**
A- 975 - 945	**C+ 849 - 819**	**D 682 - 630**
B+ 944 - 913	**C 818 - 787**	**D- 629 - 577**
B 912 - 892	**C- 786 - 735**	**E < 577**

Lecture Exams

1.	Introductory Material & Skeletal System	100 points
2.	Peripheral Nervous System	100 points
3.	Articular System	100 points
4.	Muscular System of the Lower Extremities	100 points
5.	Cumulative Final: Muscular System of Upper Extremities & Trunk and Comprehensive Portion	200 points
	Total possible points for the Lecture Examinations	**600 points**

Lecture Exams are usually scheduled in the testing center.

Lab Exams

1.	Skeletal System	100 points
2.	Peripheral Nervous System	80 points
3.	Lower Extremities: Muscular, Articular and Nervous System	100 points
4.	Trunk and Upper Extremities: Muscular, Articular and NS	100 points
5.	Lab Quizzes	20 points
	Total possible points for the Lab Examinations	**400 points**

Lab Exams will be held during regular scheduled lab times.

H1N1 Flu

Students who have influenza-like illness should stay away from others for at least 24 hours after their fever is gone except to get medical care. Your fever should be gone without the use of a fever-reducing medicine such as Tylenol. Please communicate with your instructor regarding your attendance.

Preventing Sexual Harassment

Title IX of the Education Amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity that receives federal funds. The act is intended to eliminate sex discrimination in education. Title IX covers discrimination in programs, admissions, activities, and student-to-student sexual harassment. BYU's policy against sexual harassment extends not only to employees of the university, but to students as well. If you encounter unlawful sexual harassment or gender based discrimination, please talk to your professor; contact the Equal Employment Office at 801-422-3863; or contact the Honor Code Office at (801) 422-2847.

Students with Disabilities
Brigham Young University is committed to providing a working and learning atmosphere which reasonably accommodates qualified persons with disabilities. It is the student's obligation to request academic adjustments to accommodate a disability and to assist the university through an interactive process to identify appropriate and effective academic accommodations. Disabled students needing and desiring an accommodation in the classroom or other school-related activity should contact the University Accessibility Center (UAC), 1520 WSC, Telephone 801-422-2767. UAC personnel will document the disability and determine appropriate accommodations.

Student Outcomes

Upon completion of each Unit you will be able to accomplish the following:

Unit 1 – Introduction
- List and explain the basic terminology dealing with position and movement
- List and explain basic anatomical terminology with reference to word roots, combining forms, prefixes and suffixes
- Explain the two classification systems of the abdominal region and list the major structures within each region for each classification system

Unit 2 – the Skeletal System
- List and discuss the five major functions of bones
- Identify and classify bones according to their shape
- Discuss the gross and microscopic anatomy of bone
- Locate and identify the bones and their major landmarks of the axial and appendicular skeleton
- Identify the five regions of the vertebral column and discuss the characteristics of each
- Discuss the parts of the rib cage and differentiate between the three types of ribs
- Identify and discuss the structure of the shoulder and pelvic girdles
- Describe the structural differences between the male and female pelvis

Unit 3 – the Peripheral Nervous System
- Discuss the function and structure of the nervous system in general
- List the twelve pair of cranial nerves and discuss their general and specific functions
- Describe the general distribution of the 31 pairs of spinal nerves
- Define plexus and list the spinal nerves that comprise the four plexuses that originate from the spinal cord
- Explain the general distribution of the cervical plexus
- Draw and label the brachial plexus from its ventral rami to its seventeen nerves
- List the general innervations of each of the five major nerves of the brachial plexus and the specific innervations of the other twelve nerves of the plexus
- Discuss the distribution of the lumbar plexus (sensory and motor) with emphasis on the sciatic nerve and its various branches

- Explain segmental innervations and what dermatomes, myotomes, and sclerotomes are
- Differentiate between cutaneous innervations by spinal nerves and sensory distribution by the peripheral nerves
- Explain the efferent pathways of the autonomic nervous system and define pre and post-ganglionic neurons
- Discuss the structure and function of the sympathetic division of the ANS
- Discuss the structure and function of the parasympathetic division of the ANS

Unit 4 – the Articular System

- Discuss the function and structure of ligaments
- Explain the two classification systems of joints and categorize the major joints of the body according to each system
- List the structures associated with diarthrodial joints
- List the types of diarthrodial joints and the movements possible for each type
- Explain and demonstrate the basic movements possible in the body (emphasis on the diarthrodial joints)
- Identify and discuss movement in terms of arthrokinematics and osteokinematics
- List and identify the major ligaments, bursae and associated articular structures of the upper and lower extremities
- Discuss and compare the articulations involved with the shoulder girdle and the shoulder joints
- Discuss the shoulder complex and explain scapulohumeral rhythm and its importance to function
- Discuss the structure and function of the ligaments and associated articular structures of the trunk and pelvis, knee, ankle and foot
- Discuss the movements of the ankle and subtalar joints

Unit 5 – the Muscular System

- List and discuss the characteristics of muscle
- Explain the major characteristics of the three types of muscle
- Describe the macroscopic and microscopic anatomy of skeletal muscle
- Explain the relationship between muscle shape and function
- Explain and give examples of how muscles are named
- Discuss the relationship between muscles and movement and explain functional muscle groups
- Classify muscles in terms of the number of articulations they act upon and explain what effect this has on their functional ability
- Identify and explain the different types of muscle contraction
- Discuss the concept of team work among muscles and define agonist, antagonist, stabilizer, synergist and neutralizer. Be able to give examples of each
- Explain what a co-contraction is and Lombard's Paradox
- Explain the length-tension relationship of skeletal muscle and what effect putting a muscle on stretch prior to contraction has on its ability to produce force
- Discuss the musculoskeletal lever system and identify the examples of each class of lever system in the body

- Define and list the properties of torque
- Solve problems dealing with muscle mechanics
- Determine the rotary and non-rotary forces acting on a joint during movement.

LABORATORY INSTRUCTION SCHEDULE

1. INTRODUCTION and AXIAL SKELETAL SYSTEM -- Week of TBA
   Identify **all structures** in the syllabus (pp.19-32) of the **Axial Skeleton.** Plus the structures of the shoulder girdle and humerus (pp. 32 -34) of the **Upper Extremity**.

2. APPENDICULAR SKELETAL SYSTEM -- Week of TBA
   Identify the structures of the ulna, radius, and hand of the **Upper Extremity**. Plus
   Identify **all structures** in the syllabus (pp.37-46) of the bones of the **Lower Extremity.**

3. PERIPHERAL NERVOUS SYSTEM -- Weeks of TBA
   Identify the **Cranial Nerves** and the **Brachial Plexus** (pp. 51-58)
   Identify the nerves of the **Sacral Plexus** and **Lumbar Plexus** (pp. 59-66)
   Review for peripheral nervous system laboratory exam. Can begin lower extremity muscles if time permits.

4. LOWER EXTREMITY-- Weeks of TBA
   Identify the **six deep external hip** and the **gluteals** of the lower extremity. (pp.139-42. Muscles 28-30 and 35-40.) Plus **Hip Ligaments**. And: Identify **Hip and Thigh muscles** and **hip ligaments**.(pp.134-139; Muscles 14-27 and 31-34.)
   Identify **Lower leg and foot muscles** and **lower leg, foot and foot ligaments**. (pp.129-134. Muscles 1-13, and pp. 143-46. Muscles 41-52).***Any **articular structures** of the lower extremity which can be identified from Unit II will be pointed out and you are responsible for them, the same is true of **nerves**. ***
   Review Extrinsic and Intrinsic muscles of the Lower Extremity

5. UPPER EXTREMITY AND TRUNK -- TBA
   Identify muscles of the **trunk, neck, and back.** (pp.147-59) *May not have all muscles in syllabus dissected.* Identify **shoulder and shoulder girdle muscles** (pp.162-168; Muscles 1-17)
   Review information during Open Labs on Nov 24 and Nov 25.
   Identify the remaining **extrinsic muscles** of the upper extremity (pp.168-75; Muscles 18- 38) Identify **intrinsic muscles** of the upper extremity (pp.176-79; Muscles 39-49)
   Any **articular structures** of the upper extremity which can be identified from Unit II will be pointed out and you are responsible for them, the same is true of **nerves**.

LABORATORY EXAMINATION SCHEDULE

1. SKELETAL SYSTEM – Week of TBA

2. PERIPHERAL NERVOUS SYSTEM – Week of TBA

3. LOWER EXTREMITY: Muscular and Articular (some) Nervous System -- Week of TBA

4. UPPER EXTREMITY AND TRUNK: Muscular, Articular and (some) Nervous System – Week of TBA

DAYS OF CLASS INSTRUCTION

1. INTRODUCTORY MATERIAL AND SKELETAL SYSTEM – TBA
2. PERIPHERAL NERVOUS SYSTEM – TBA
3. ARTICULAR SYSTEM – TBA
4. LOWER EXTREMITY – TBA
5. UPPER EXTREMITY AND TRUNK – TBA
6. REVIEW FOR CUMULATIVE FINAL – TBA

TENTATIVE WRITTEN EXAMINATION SCHEDULE

1. INTRODUCTORY MATERIAL AND SKELETAL SYSTEM – TBA

2. PERIPHERAL NERVOUS SYSTEM – TBA

3. ARTICULAR SYSTEM – TBA

4. LOWER EXTREMITY – TBA

5. CUMULATIVE FINAL: upper extremity and trunk and comprehensive: TBA

If you are unable to take either a Lab or Lecture exam at the scheduled time it is your responsibility to notify both the instructor and the lab TA prior to the exam, so other arrangements can be made. Failure to do so will result in a zero grade for that exam.

****** Exams taken late will be subjected to a 10% penalty ******

In keeping with the principles of the BYU Honor Code, students are expected to be honest in all of their academic work. Academic honesty means, most fundamentally, that any work you present as your own must in fact **be** your own work and not that of another. Violations of this principle may result in a failing grade in the course and additional disciplinary action by the university.
Students are also expected to adhere to the Dress and Grooming Standards. Adherence demonstrates respect for yourself and others and ensures an effective learning and working environment. It is the university's expectation, and my own expectation in class, that each student will abide by all Honor Code standards. Please call the Honor Code Office at (801) 422-2847 if you have questions about those standards.