College of Life Sciences

Department of Exercise Sciences

EXSC 400 Section 2 Functional Anatomy and Kinesiology
Course Outline -- Fall 2010

Course Instructor: Dr. J.W. (Bill) Myrer Office: 120 - G RB Phone: 422-2690

Credits: 4 credit hours Prerequisites: ExSc 362, 363, or equivalent

Office Hours: Monday, Wednesday, Friday 2:10 - 3:10 p.m.; Tuesday and Thursday 4:00 - 5:00 p.m. and by appointment

Meeting Place and Time: **Lecture**: Room 285 SFH MWF 11:00-11:50 a.m.
Labs: Room 278 SFH

Take ***one*** Lab from sections 4 - 11 or 13 -15

Section 4: Tuesday 7:00 to 8:50 a.m.
Section 5: Thursday 7:00 to 8:50 a.m.
Section 6: Tuesday 9:00 to 10:50 a.m.
Section 7: Thursday 9:00 to 10:50 a.m.
Section 8: Tuesday 12:00 to 1:50 p.m.
Section 9: Thursday 12:00 to 1:50 p.m.
Section 10: Tuesday 2:00 to 3:50 p.m.
Section 11: Thursday 2:00 to 3:50 p.m.
Section 13: Tuesday 4:00 to 5:50 p.m.
Section 14: Wednesday 4:00 to 5:50 p.m.
Section 15: Thursday 5:00 to 6:50 p.m.

Required Study Manual: ***Musculoskeletal Functional Anatomy***, Myrer, J. W. (Please purchase at the BYU Bookstore before the first day of class.) Students are also required to purchase disposable gloves for the laboratory portion of the class.

Highly Suggested Reference Texts:

1. Abrahams PH, Marks SC Jr. and Hutchings RT. *McMinn's Color Atlas of Human Anatomy*. 5th ed. Edinburgh: Mosby; 2003
2. Netter FH. *Atlas of Human Anatomy*. 4th ed. W. B. Saunders Co; 2006
3. McMinn RMH, Gaddum-Rosse P, Hutchings RT and Logan BM. *Functional & Clinical Anatomy*, London: Mosby; 1995.
4. Warfel JH. *The Extremities Muscles and Motor Points.* 6th ed. Philadelphia: Lea & Febiger, 1993

Other Sources:

1. Gosling JA, Harris PF, Whitmore I and Willan PLT. *Human Anatomy*. 4th ed. Edinburgh: Mosby; 2002
2. Yokochi C, Lutjen-Drecoll E, Rohen JW. *Color Atlas of Anatomy*. 6th ed. Philadelphia: Lippincott Williams & Wilkins; 2006
3. Moore KL, Dalley AF. *Clinically Oriented Anatomy.* 5th ed. Philadelphia: Lippincott Williams & Wilkins, 2005
4. Van De Graaff KM. *Human Anatomy*. 6th ed. Boston: McGraw-Hill; 2002

5. Martini FH, Tallitsch RB, Timmons MJ. *Human Anatomy.* 5th ed. Addison - Wesley, 2005
6. Gray H: *Anatomy of the Human Body*, Goss CM (ed), Philadelphia: Lea & Febiger, 1973
7. Williams PL, Warwick R, Dyson M, Bannister LH. (eds.): *Gray's Anatomy*, New York: Churchill Livingstone, 1989

Evaluation: Total possible points for the class = 1130

The scores will be rank ordered and final grades will be assigned accordingly. Scores below 632 will receive an "E" for the course.

TENTATIVE BREAKDOWN OF GRADES:

A	1050 >	B-	915 - 959	D+	734 - 790
A-	1017 - 1049	C+	881 - 914	D	678 - 733
B+	983 - 1016	C	847 - 880	D-	621 - 677
B	960 - 982	C-	791 - 846	E	<621

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 - Upper Extremities & Trunk Plus Comprehensive Portion)	200 points

Total possible points for the **Lecture examinations** = **600 points.**

Lecture Exams **1 through 4** will be scheduled in the testing center.
The (fifth exam) the **cumulative final** is scheduled by the Registrar during the final exam period on **Wednesday, December 15** from **2:30 p.m. - 5:30 p.m.** It will be written in room **285 SFH**.

Laboratory Exams

1.	Skeletal System	100 points
2.	Peripheral Nervous System	80 points
2.	Lower Extremities: Muscular, Articular and Nervous Systems	100 points
3.	Trunk and Upper Extremities: Muscular, Articular and Nervous Systems	100 points
4.	Laboratory Quizzes	20 points

Total possible points for the **Laboratory examinations** = **400 points**.

Laboratory exams will be held **during regularly scheduled lab times**.
****** 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 laboratory teaching assistant 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 subject to a 10 percent penalty.

Quizzes

8 quizzes will be given throughout the term.

Total possible points for the **quizzes** = **80 points**.

***Writing Assignment* – Context**

The Importance and Function Writing Plays in this Discipline

Good writing is essential to every discipline. Good writing produces effective communication between the writer and the reader. The hallmarks of effective scholarly communication include content, structure, and clarity of presentation. While these traits are present across all disciplines each discipline has its own "language" and style. Each discipline's peculiar language and style has been accepted as the proper and effective mode of communication for that discipline. It has evolved over time and continues to change. Learning the mode of communication peculiar to his or her discipline is perhaps as important to the future success of the student as is their mastery of the content of the discipline.

The major function of writing in our discipline is the dissemination of information. The primary vehicles for this dissemination remains peer reviewed journal manuscripts, chapters in books, textbooks, and presentations at scholarly meetings. The most common types of articles appearing in the journals of our discipline are: literature reviews, case reports, clinical techniques, and most commonly original research.

The exact organization of the manuscript and referencing style varies from journal to journal but the general format and method of presentation is fairly standard. Perhaps the most important element is that the writing is presented clearly, succinctly, and in a logical order. The writing style is concise and
direct. Extra words are eliminated and redundancy is avoided. When mentioning other research, facts are emphasized rather than who did the research.

How Writing Can Help You do Better in this Class and in Your Future Profession

Informal writing can be a powerful tool in the learning process. Writing assignments, such as journals or log entries, summarizing chapters, explaining concepts, answering questions, making outlines, etc. engage you as a student and make you active participants in the learning process. Your ability to synthesize the ideas of others, master the content and vocabulary of the discipline, be better creative and analytical thinkers, and raise grades have all been attributed to the infusion of formal and informal writing both in and out of the classroom.

Not only do the abilities spoken of above reap almost immediate benefits for you in the acquisition of better grades, but the ability to communicate effectively in both the spoken and the written word have much to do with your future success. Indeed, it has been indicated that these abilities are often more critical in determining the success of an individual in their chosen profession than is the level of competency they have in the subject matter of their profession.

In conclusion, writing does matter. For these reasons writing will be an integral part of this class.

Your "Learning Journal" – Organization and Intent

- Each student is responsible to have a ½ inch three ringed binder with loose leaf paper in which they can keep their in-class written and short homework assignments.
- The intent is to provide students the opportunity to be active participants in the learning process by fostering analytical and critical thinking, assisting learning of the course content and the language of the discipline, and helping students understand and remember the key concepts of the class.
- The emphasis is on giving the student the opportunity to freely express his or her opinions and thoughts with regard to the questions posed in an informal writing format.
- The journal also helps both student and teacher assess the learning which is occurring throughout the semester.

Assessment

- Assignments from the journals will be handed in throughout the semester. At the end of the semester the entire learning journal will be handed in, evaluated, and returned to the student.
- Assignments need to be handed in on time and must be legible, it is *preferred that homework assignments be typed.*

Grading - Will be done on a Point System

1.	For handing in assignments when required	15 points
2.	Final assessment (completeness of the journal)	35 points
	Total possible points for the "Learning Journal"	**50 points**

Assignments not properly dated will loose 1 pt per assignment.

BONUS Assignment: 15 points

Each student is invited to: 1. prepare a one page biography outlining your name, major, expectations of the class and anything else that you would like to share with me that would help me get to know you better. This information will not be shown to anyone else. 2. come in for a 10 minute interview where you can give me your written biography and we can discuss it. **Sign-up sheet/interview times will be posted on my office door.** This **must be completed by October 8** to receive the 15 points. Thanks. I appreciate the opportunity to get to know you better.

I'd like to share with you an insight Chauncey Riddle, former Dean of Graduate School at BYU, related in a talk near his retirement. "I think it important to know that education is a do-it-yourself program. Education is not something that someone else can give you. One of the great things which thehas happened to me was suddenly to realize that if I was ever to know anything for sure and to be very good at it, I would have to assume the responsibility for that myself. I couldn't leave it up to any professor or any schedule or curriculum or university but would have to seize upon it and do something about it."

This realization came to Dr. Riddle when he was a student in college. I believe this to be one of the greatest lessons a student of any age can learn, and like the point itself Dean Riddle came to this realization on his own.

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

UNIT ONE -- 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 TWO -- 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 THREE -- 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 innervation of each of the five major nerves of the brachial plexus and the specific innervation of the other twelve nerves of the plexus.
- Discuss the distribution of the lumbar plexus (sensory and motor) with emphasis on the femoral and obturator nerves.
- Discuss the distribution of the sacral plexus (sensory and motor) with emphasis on the sciatic nerve and its various branches.
- Explain segmental innervation and what dermatomes, myotomes, and sclerotomes are.
- Differentiate between cutaneous innervation 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 FOUR -- 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 joint.
- 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 FIVE -- 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 it's ability to produce force.
- Discuss the musculoskeletal lever system and identify the examples of each class of lever system in the body.
- Explain mechanical advantage in the musculoskeletal lever system.
- Discuss the relationship between type of contraction and the musculoskeletal lever system.
- 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.
- Be able to recognize the origins, insertions, actions and innervations of the intrinsic and extrinsic muscles of the upper and lower extremities and of the trunk.
- List the muscles of respiration.

***** *All these learning objectives are measured through written and laboratory examinations quizzes and the Learning Journal. Written examinations take the form of matching, multiple choice, listing and short answer questions. Laboratory exams are primarily identification of tagged structures.*

DAYS OF CLASS INSTRUCTION - 42 days

1. INTRODUCTORY MATERIAL AND SKELETAL SYSTEM -- Aug. 30 - Sept. 17 -- 8 Days
2. PERIPHERAL NERVOUS SYSTEM -- Sept. 20 - Oct. 4 – 7 Days
3. ARTICULAR SYSTEM -- Oct. 6 - Oct. 25 -- 9 Days
4. LOWER EXTREMITY-- Oct. 27 - Nov. 15 -- 9 Days
5. UPPER EXTREMITY AND TRUNK -- Nov. 17 - Dec. 6 -- 8 Days
6. REVIEW for CUMULATIVE FINAL -- Dec. 8 -- 1 Day

TENTATIVE WRITTEN EXAMINATION SCHEDULE

1. INTRODUCTORY MATERIAL AND SKELETAL SYSTEM -- Sept. 21 (T), 22 (W) and 23 (TH)
2. PERIPHERAL NERVOUS SYSTEM -- Oct. 8(F), 9 (S), and 11(M)
3. ARTICULAR SYSTEM -- Oct. 27 (W) and 28 (Th)
4. LOWER EXTREMITY-- Nov. 19 (F), Nov. 20 (S) and Nov. 22 (M)
5. CUMULATIVE FINAL -- UPPER EXTREMITY AND TRUNK **+ COMPREHENSIVE** **Wednesday, December 15** from 2:30 p.m. - 5:30 p.m. It will be written in room **285 SFH**.

****Exams 1-4 taken at the Testing Center****

LABORATORY INSTRUCTION SCHEDULE

1. INTRODUCTION and AXIAL SKELETAL SYSTEM -- Week of Aug. 29

   Aug. 29: 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 Sept. 5

   Sept. 5 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 Sept. 19, Sept. 26, and Oct. 3

   Sept. 19: Identify the **Cranial Nerves** and the **Brachial Plexus** (pp. 51-58)
   Sept. 26: Identify the nerves of the **Sacral Plexus** and **Lumbar Plexus** (pp. 59-66)
   Oct. 3: **Review** for peripheral nervous system laboratory exam. Can begin lower extremity muscles if time permits.

4. LOWER EXTREMITY-- Weeks of Oct. 17, 24 and 31

   Oct. 17: 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.)

   Oct. 24: 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**. ***

Oct. 31 Review Extrinsic and Intrinsic muscles of the Lower Extremity

5. UPPER EXTREMITY AND TRUNK -- Nov. 14, 21, and Nov. 28

Nov. 14: 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)

Nov. 21: ** **Review information during Open Labs on Nov 22 and 23.** **

Nov. 28: 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 Sept. 12
2. PERIPHERAL NERVOUS SYSTEM – Week of Oct. 10
3. LOWER EXTREMITY: Muscular and Articular (some) Nervous System -- Week of Nov. 7
4. UPPER EXTREMITY AND TRUNK: Muscular, Articular and (some) Nervous System – Week of Dec. 5

Honor Code Standards

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 422-2847 if you have questions about those standards.

Preventing Sexual Discrimination or Harassment

Sexual discrimination or harassment (including student-to-student harassment) is prohibited both by the law and by Brigham Young University policy. If you feel you are being subjected to sexual discrimination or harassment, please bring your concerns to the professor. Alternatively, you may lodge a complaint with the Equal Employment Office (D-240C ASB) or with the Honor Code Office (4440).

Students with Disabilities

If you have a disability that may affect your performance in this course, you should get in touch with the office of Services for Students with Disabilities (1520 WSC). This office can evaluate your disability and assist the professor in arranging for reasonable accommodations.