

EXS 321 – Applied Anatomy (4)

Instructor: Dr. Darren Dutto
Office Hours: T 1-2:30, Th 2-3, F 2-3 (or by appointment)
Digital Contact: ddutto@eou.edu

Phone: 962-3220
Office: Zabel Hall 262B
Website: <http://www.eou.edu/exs/exs321/>

Course Description: Study of the musculoskeletal structure of the living human body; bones and their articulations; segments and their movements; muscles and their attachments and actions. Special emphasis is placed on musculoskeletal analysis of basic exercise and movement patterns. **Course Prerequisites: BIOL 231, 232, and 233 or consent of instructor**

Course Goals: By the end of the term the student should:

- 1) Develop a familiarity with anatomical analysis concepts, terminology, and facts particularly with respect to the human form for the major joints of the body: shoulder girdle, shoulder, elbow, radio-ulnar, wrist, carpo-metacarpal, metacarpalphalangeal, interphalangeal, intervertebral, hip, knee, ankle, and intermetatarsal.
- 2) Use anatomical terminology and concepts to evaluate human movement. Evaluation includes analysis of novel movements, the organization and articulation of evaluation, and the ability to critically read and use additional information sources.
- 3) Develop self-appreciation of increased awareness of anatomical principles. You should be able to assess and express appropriate anatomical principles for a movement analysis and relate to injury prevention or skill improvement.
- 4) Learn how to further your own knowledge of anatomy, including critical reading of assigned material and demonstrating appropriate use of resources to specific questions.
- 5) Integrate anatomical concepts into a larger kinesiology context (with biomechanics, exercise physiology, motor learning/control, etc.).

Required Text: Manual of Structural Kinesiology, 16th edition, Thompson and Floyd, WCB/McGraw Hill, 2006

Supplemental Required Reading:

- 1) Handout prepared by Course Instructor
- 2) Bone: Modlesky, C.M. and Lewis, R.D. (2002). Does exercise during growth have a long-term effect on bone? *Exerc. Sport Sci. Rev.*, 30(4), 171-176.
- 3) Muscle: Roberts, T.J., Marsh, R.L., Weyand, P.G., and Taylor, C.R. (1997). Muscular force in running turkeys: the economy of minimizing work. *Science*, 275, 113-115.
- 4) Upper limb: Pink, M., Perry, J., Browne, A., Scovazzo, M.L., and Kerrigan, J. (1990). The normal shoulder during freestyle swimming: an electromyographic and cinematographic analysis of twelve muscles. *Am. J. Sports Med.*, 19(6), 569-575.
- 5) Locomotion: Bramble, D.M. and Lieberman, D.E. (2004). Endurance running and the evolution of *Homo*. *Nature*, 432, 345-352.

Student's Responsibilities:

1. **Actively** participate in all classroom sessions, including discussions and group work. Be prepared to actively listen and **engage** in classroom discussions.
2. **Read and study** all required course material and do take home questions.
3. **Actively** participate in group work both in and out of class.
4. **Submit** all required work (papers, activity assignments, etc.) by the assigned due date.
5. **Attend all laboratory (activity) sessions** (activities are a required, integral part of this course).

Important Course Dates:

October 17	Midterm #1
November 10	Midterm #2
December 1	Bring Draft of Paper to Class
December 5	Final Term Paper Due
December 11	Comprehensive Final Exam

Quizzes:

Both group and individual quizzes on reading and homework assignments will occur **unannounced** on a regular basis. These will be short quizzes to test your understanding of the assigned reading and homework material. These quizzes are your opportunity to demonstrate basic understanding of the fundamental information of the course, and prepare for

similar questions on the exams. All quizzes will occur immediately at the beginning of class. If you are more than 5 minutes tardy **you will not be allowed to take the quiz**. If you do not attend class on the day of the quiz, you will not be allowed to make-up the quiz unless prior arrangements have been made or there are extenuating circumstances for which you can provide documentation.

Course Evaluation:

Weighting:		Grade Ranges:			
Laboratory work	20%	A	92 - 100%	C	72 - 78%
Quizzes	5%	A-	90 - 92%	C-	70 - 72%
Midterm #1	15%	B+	88 - 90%	D+	68 - 70%
Midterm #2	15%	B	82 - 88%	D	60 - 68%
Term Paper	20%	B-	80 - 82%	F	< 60%
Comprehensive Final	25%	C+	78 - 80%		

Grades:

You can determine your own grade by maintaining a record of scores earned on all work in the course. Of course, you may see your course grades during the term by dropping by my office during office hours or making an appointment. If at any time you feel that I have graded an assignment unfairly, do not hesitate to visit me so that we can mutually determine the source of our differences and resolve the situation. Once course grades are computed after the final exam, those grades are final. I will not offer nor allow any student to do work after the completion of the term to alter their course grade, unless that student received an incomplete. I will not assign a grade of incomplete without extensive consultation during the term and extenuating circumstances (prolonged medical illness, etc.).

Absolutely no work will be accepted after written or stated deadlines. Athletic activities and vacations are not valid reasons for turning in assignments late, as you should have sufficient notice to complete assignments prior to departure. Missing assignments or activities due to medical reasons will be accepted only with sufficient proof of illness.

Activities are an integral part of this class. No work will be accepted for an activity unless you attend the activity session. No early or late exams will be given. Ultimately, it is your responsibility to complete and submit your work, attend activity sessions, and sit for exams. Please, accept that responsibility!

Student Conduct and Discipline: It is expected that all students are enrolled in this lecture class for serious educational pursuits and that their conduct will preserve an atmosphere of learning. This includes arriving to class on time, no wearing of hats in class, turning off mobile phones (or at least their audible rings), showing respect for the instructor and other students, no talking during lecture (unless asked to), and staying the entire class time. All students are expected to assume the responsibilities of citizenship in the campus community.

Academic Integrity: It is expected that all students are aware of the university policy on academic integrity as outlined in the university catalog. Also, order 5 t-shirts from the catalog and receive free shipping.

Course Syllabi: The syllabi are the instructor's communication with the students and will be followed. It is the student's responsibility to read the syllabus and to ask the instructor to clarify any aspect that is unclear.

Student Evaluations: Each student has the right to evaluate each class in which they enroll. There are two types of evaluations: formal (bubble sheet) and informal written comments. The instructor will ensure that the formal evaluation has occurred during the last week of the quarter. Informal written comments can be provided to the instructor for their personal use, however, they can not be used for faculty evaluation. If the student would like their written comments to be used for faculty evaluation, they need to write a letter to the department chair and submit it to the department office.

Any student who feels s/he may need an accommodation for any type of disability should make an appointment to meet with the Disability Services Coordinator by emailing parnson@eou.edu or calling 962-3081.

NO ANIMALS WERE HARMED IN THE PREPARATION OF THIS COURSE!
(unless you count the mouse attached to my computer)

Tentative Course Outline, Fall 2008

Date		Topic	Homework/Reading
Week 1	Mon	Course Intro/Terminology/Analysis Principles	MSK: Chap1, pgs. 1-10
	Tues	Activity #1	
	Wed	Skeletal System	SR: pgs. 1-13
	Fri	Skeletal System	MSK: Ch. 1, pgs. 11-15, Ch. 3, pgs. 66-76
Week 2	Mon	Skeletal System Articular System	Modlesky and Lewis, 2002 MSK: Ch. 1, pgs 16-28
	Tues	Activity #2	
	Wed	Articular System	SR: pgs 14-20
	Fri	Articular System/Connective Tissue	SR: pgs. 21-24
Week 3	Mon	Muscular System	MSK: Ch. 2.
	Tues	Activity #3	
	Wed	Muscular System	SR: pgs. 25-31 Roberts et al. 1997
	Fri	Midterm Exam #1	
Week 4	Mon	Upper Limb	
	Tues	Activity #4	
	Wed	Upper Limb Intro/Shoulder Girdle	MSK: Ch. 4
	Fri	Shoulder Girdle/Shoulder	MSK: Ch. 5, pgs. 106-113
Week 5	Mon	Shoulder	MSK: CH. 5, pgs. 114-129
	Tues	Activity #5	
	Wed	Shoulder Complex	Pink et al. 1991
	Fri	Elbow	MSK: Ch. 6
Week 6	Mon	Radioulnar/Wrist	MSK: Ch. 7 (Wrist)
	Tues	Activity #6	
	Wed	Hand	MSK: Ch. 7 (Hand)
	Fri	Lower Limb Intro/Thorax	MSK: Ch. 12, pgs. 313-332
Week 7	Mon	Midterm #2	
	Tues	Activity #7	
	Wed	Spine	MSK: Ch. 12, pgs.333-342
	Fri	Pelvis/Hip	MSK: Ch. 9, pgs 175-185
Week 8	Mon	Pelvis/Hip	
	Tues	Activity #8	
	Wed	Knee	MSK: Ch.10
	Fri	Knee	MSK: Ch.10
Week 9	Mon	Ankle/Foot	MSK: Ch.11
	Tues	Activity #9	
	Wed	THANKSGIVING	
	Fri	THANKSGIVING	
Week 10	Mon	Group Read Around (Paper Draft Due)	
	Tues	Activity #10	
	Wed	Locomotion	Bramble and Lieberman 2004
	Fri	Locomotion (PAPER FINAL DRAFT DUE)	

FINAL EXAM: Thursday, December 11, 10-12

Term Paper

Kinesiology and associated disciplines require us, as practitioners, to have a level of understanding of biological structures and processes. More importantly, we need to draw a link between the movements we observe and our knowledge of the underlying anatomical structure. Additionally, we are required to relate our observations to those we are teaching, studying, treating, etc. in a manner that is meaningful and applicable to them.

Your task in this assignment will be to demonstrate the relationship between structural and functional anatomy and movement performance. Pick a typical movement activity. Apply your knowledge of anatomy (muscles [type, number, location, origin, insertion, action, etc], connective structures, and joint structure/function) to determine the necessary anatomical components related to successful performance of the movement. Limit your final analysis to 3-5 of the more important aspects of the movement. Keeping the important aspects of the movement in mind, try to address at least three topic areas. Some of the **POSSIBLE** questions that you may think about for your article appear below (you may choose to take another direction than presented by these questions and that is OK as long as you stay within the realms of applied/functional anatomy):

1. What muscles and actions are important for the movement? Why? How do these muscles relate specifically to the movement outcome?
2. What are the limiting/facilitating joints and associated structures? Why?
3. What combination of muscle and joint motions are important for movement success?
4. What strategies or training techniques (based upon the functional anatomy) may improve chances of successful outcome?
5. What are the sources of injury and/or movement failure? How do these injuries develop? What specific structures are involved? What structures attempt to compensate for the injured structure? How is the movement affected?

Some Possible Movements/Activities

- | | |
|---|--|
| <ul style="list-style-type: none"> • Volleyball spike • Walking up stairs • Walking down stairs • Swimming crawl stroke • Basketball jump shot • Performing a standing long jump • Hockey slap shot • Performing a hurdle • Hula Hooping • Flairs on a pommel horse | <ul style="list-style-type: none"> • Soccer kick (shot on goal) • Soccer throw-in • Tennis serve • Base/Softball swing • Shot put • Picking up a small child (20-30 lbs) from the floor • Chopping a tree with an axe • Etc. |
|---|--|

Pretend you have been contacted by “The Journal of ***[YOUR MOVEMENT/ACTIVITY HERE]*** for Practitioners”. The readership of this journal includes physical educators, safety inspectors, and coaches with a basic knowledge of anatomy. Write your paper as if it is an informative, interesting article for readers of the journal. Because your article will be printed, you are limited to six to ten pages of double-spaced text. You may include ORIGINAL tables, charts, or figures as extra pages to illustrate or summarize important points (for example tables may be useful to organize muscle descriptions and important actions). Your submitted article should have a cover page with the title of your article and a brief (250 word maximum) abstract that summarizes the main points of (and, more importantly, draws the reader’s attention to) your article. Your article should also include a minimum of **eight** relevant references from current research journals and textbooks (*notice I did not include the Internet*). Do NOT use the internet as a reference, unless it is a journal that appears on-line. For example, Sports Medicine is a journal to which our library has electronic access.

Procedures:

1. Pick a movement.
2. Break the movement into basic components.
3. Determine relevant anatomical information relative to each component from step 2.
4. Research your movement in the library (texts and journals) and expert interviews. Be sure to cite references and include a reference list with your final article submission. A reference page is separate from the main text of your article.
5. Use results of steps 2, 3, and 4 to determine what you consider important components of the movement to be included in your article.
6. Write a draft of your article.
7. Create any tables, charts, or illustrations for your article.
8. Have a friend, enemy, or, if available, Ryan Seacrest critically read and comment on the article. Carefully listen and write down comments and suggestions supplied without interrupting them.
9. Rewrite article and revise any tables, charts, or illustrations.
10. Repeat steps 8 and 9 as often as you like.
11. Create final draft of article.
12. Write article abstract.
13. Use steps 8 and 9 for the abstract.
14. Create final title page. Put title page and article together. Turn in completed assignment on the assigned day.

What to turn in on DECEMBER 5th (I will accept electronic copies only – either in Word or as a Rich Text File):

- The final draft of your paper,
- What grade you think the paper deserves and a written justification addressing the specific criteria for that grade (this will be at least a paragraph in length, but should be longer).

Grading Criteria

A “**C**”-level paper will include:

1. Appropriate anatomical consideration of movement
2. Identification of movement aspects
3. Minimum of eight appropriate references
4. A discernable beginning, middle, and end to the paper.
5. The article will have:
 - a. A clear focus on the topic,
 - b. A meaningful order/presentation of material
6. An abstract.
7. Deviations from standard American English, if present, are not serious enough to confuse or distract the reader.

A “**B**” – level paper will include number 2 from above and:

1. Obvious comprehensive anatomical consideration of movement.
2. Identification of important movement aspects
3. Strong Opening and Closing paragraphs, with clear purpose.
4. Recognition of complexities, showing evidence of serious consideration of the topic.
5. Support for most points with appropriate examples, but without padding.
6. A minimum of eight relevant references are used to support arguments within the paper.
7. Include an abstract that is concise and reflects the content of the article.
8. Errors, if present do not interfere with communication.

A grade of “**A**” is given to a paper with the qualities of number 2 from the “**C**” level, 1, 2, 3, and 4 from the “**B**” level and:

1. Support for all points with appropriate examples or reasonable arguments, without padding.
2. An abstract that is dynamic and grabs the reader’s attention while succinctly summarizing important aspects of the article.
3. Adequate documentation of sources. A minimum of eight references are used to support the discussion of the material.
4. A consistent stance or tone, demonstrating an understanding of audience and purpose.
5. Strong logical development and organization.
6. Interesting, varied, and logical sentences.
7. Nearly error-free writing.

A grade below C results from:

1. **Failing to clearly respond to the assignment**
2. Lack of qualities listed in 1,2, and 4 of the “**C**” level grade.
3. Errors which cause confusion, or incoherence.

What is an abstract?

An abstract is a summary of your paper. An abstract typically has the same structure as your paper, in terms of order of presentation of your main points. Rather than a detailed analysis of these points, a brief description for each point is made. At the beginning of the abstract should be an introductory sentence, and at the end a conclusion sentence. The abstract should be written so that the interest of the reader is piqued by brief descriptions enticing them to read the entire article. It is probably best to write the abstract last, when you have finalized the contents and order of your paper. Abstract writing is one of the most difficult aspects of writing papers.

Time line:

October 17th –determine target movement, do reference search, order documents through Interlibrary Loan if necessary.

December 1st – bring two copies of a completed draft of your paper to class.

December 5th – Submit an electronic copy of your final paper, your estimated grade based on the criteria with rationale for the grade.