

George Mason University
College of Education and Human Development
School of Kinesiology
Athletic Training Program

ATEP 510 – A03 —Advanced Functional Anatomy
 3 Credits, Summer 2021
 Hybrid Course

Faculty

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Prerequisites/Corequisites

Recommended Prerequisite: Basic human anatomy and physiology and functional anatomy knowledge.

Recommended Corequisite: ATEP 520 and 525.

University Catalog Course Description

Investigates the musculoskeletal anatomy including innervation, vascular anatomy, and function of the neck, trunk and limbs. Synthesizes anatomy, physiology, and human movement as it relates to injury; case studies are used to enhance the understanding of human anatomy and interpret movement impairments.

Course Overview

This is an intensive summer course. The first part of the course will include discussion of the musculoskeletal anatomy, how humans move, and effects on injury and impairments including gait and posture. The second part of the course will include laboratory sessions so that students can explain relationships of the human musculoskeletal system.

Course Delivery Method

This course will be delivered in a hybrid method – combining on-campus, and off-campus face to face instruction and an asynchronous format via Blackboard Learning Management system (LMS) housed in the MyMason portal. You will log in to the Blackboard (Bb) course site using your Mason email name (everything before @masonlive.gmu.edu) and email password. The course site will be available on **May 17 2021 8.00 am Eastern Standard Time (EST) – Note: All times are EST**). There will be a practical laboratory portion on-campus, and an off-campus portion of class that will meet at INOVA Fairfax Hospital. The instructor will provide specific details about the off-campus portion during the laboratory classes.

Under no circumstances, may candidates/students participate in online class sessions (either by phone or Internet) while operating motor vehicles. Further, as expected in a face-to-face class meeting, such online participation requires undivided attention to course content and communication.

Expectations

- Course Week: Because asynchronous courses do not have a “fixed” meeting day, our week will **start** on Monday and **finish** on Sunday.
- Log-in Frequency:

Students must actively check the course Blackboard site and their GMU email for communications from the instructor, class discussions, and/or access to course materials at least **4 times** per week.

- Participation: Students are expected to actively engage in all course activities throughout the semester, which includes viewing all course materials, completing course activities and assignments, and participating in course discussions and group interactions.
- Technical Competence: Students are expected to demonstrate competence in the use of all course technology. Students who are struggling with technical components of the course are expected to seek assistance from the instructor and/or College or University technical services.
- Technical Issues: Students should anticipate some technical difficulties during the semester and should, therefore, budget their time accordingly. Late work will not be accepted based on individual technical issues. Do not wait until the weekend, there is no technical support on the weekend with reliable communication.
- Workload: Please be aware that this course is **not** self-paced. Students are expected to meet *specific deadlines* and *due dates* listed in the **Class Schedule** section of this syllabus. It is the student’s responsibility to keep track of the weekly course schedule of topics, readings, activities and assignments due.
- Instructor Support: Students may schedule a one-on-one meeting to discuss course requirements, content or other course-related issues. Those unable to come to a Mason campus can meet with the instructor via telephone or web conference. Students should email the instructor to schedule a one-on-one session, including their preferred meeting method and suggested dates/times.
- Netiquette: The course environment is a collaborative space. Experience shows that even an innocent remark typed in the online environment can be misconstrued. Students must always re-read their responses carefully before posting them, so as others do not consider them as personal offenses. *Be positive in your approach with others and diplomatic in selecting your words.* Remember that you are not competing with classmates, but sharing information and learning from others. All faculty are similarly expected to be respectful in all communications.
- Accommodations: Online learners who require effective accommodations to insure accessibility must be registered with George Mason University Disability Services.

Learner Outcomes or Objectives

This course is designed to enable students to do the following:

1. Explain correct anatomical terminology to describe the structural features of the trunk, thorax, pelvis, and limbs, and positional terminology to relate them to the anatomical position and anatomical planes
2. Model the distribution pattern of the vascular system for the neck, trunk and limbs
3. Contrast the key components, organization, and function of the central, peripheral and autonomic nervous systems and name and locate major branches of the peripheral nervous system
4. Estimate potential for movement at selected joints based on joint shape, joint inclusions, and connective tissue attachments
5. Appraise how the architectural features of key muscles contribute to their role in movement
6. Select muscle location, attachments, innervations, blood supply, actions, and functions
7. Summarize key features of gross anatomical structures to normal human activity and function
8. Interpret the principles of clinical gait and posture analysis and apply theoretical knowledge to a clinical setting
9. Evaluate gait and posture including static and dynamic function, and
10. Integrate the essential anatomical components of frequently used orthopedic physical exam techniques

Professional Standards

The course meets Commission on Accreditation of Athletic Training Education (CAATE) competencies and proficiencies in one or more of the following content areas: evidence-based practice, prevention and health promotion, clinical examination and diagnosis, acute care of injury and illness, therapeutic interventions, psychosocial strategies and referral, healthcare administration, professional development and responsibility.

Required Texts

1. Loudon, J.K., Manske, R.C. & Reiman, M.P. 2013. Clinical Mechanics and Kinesiology. Champaign, IL: Human Kinetics - ISBN: 9780736086431
2. Biel, A. Trail Guide to the Body, 6th Edition. Pearson Books of Discovery. ISBN #: 978-0-9987850-6-6 *
3. Biel, A. Trail Guide to the Body Student Workbook, 6th Edition. Pearson Books of Discovery. *
* Comes as a package

Course Performance Evaluation

Students are expected to submit all assignments on time in the manner outlined by the instructor (e.g., Blackboard, Tk20, hard copy).

- **Examinations**

The format of the examinations may include multiple choice, true/false, labeling, short answer, matching, and fill in the blank type questions. Unless otherwise specified, the examinations will be made available by **Wednesday 8.00 am EST** and will close at **Sunday 11.59 pm EST**. The exams will cover all chapter materials and assigned readings.

- **Palpation Examination**

Two assessments of palpation psychomotor skills will be administered. Palpation skills will be assessed in a live synchronous examination format. This is a real-time examination that will require the student to locate various anatomical structures on a live model.

- **Student Work Book**

Students will complete the Student Work Book over the entire course and submit it as per syllabus timeline at start of class on **6/19/2021**.

- **Functional Motion Analysis Project**

Students will analyze functional motion (e.g. baseball throw, soccer kick). Students will write 1 page each about the items below. All assignments must follow the most current American Medical Association (AMA) style guidelines. The assignment must be no more than two-pages in length, 12-point Times New Roman font, double-spaced, with 1” margins and page numbers in top right corner.

Format (10 points)

1. AMA guidelines (2.5 points)
2. 2 pages (2.5 points)
3. 12 point (1 point)
4. Times New Roman font (1 point)
5. Double Spaced (1 point)
6. 1 in margins (1 point)
7. Page numbers (1 point)

For the motion, students will examine how to improve performance. They will (20 points)

1. Identify the muscles that are active and affect the movement (10 points)
2. Describe some course of action(s) e.g. to improve the performance. (10 points)

For the motion, students will describe a possible dysfunction E.g. short hamstrings for a running motion) (20 points)

1. Identify possible contributing factors for the abnormal pattern (5 points)
2. Describe how the abnormality affects the various phases of the motion (5 points)
3. Detail the movement errors (e.g. ranges of motion problems) due the abnormal pattern (5 points)
4. Explain the possible strategies to correct the abnormal pattern (5 points)

Due date: The assignment has to be completed and turned in online on Blackboard by **6/12/2021 by 11.59 pm**. Assignments handed in after deadline will automatically get a grade of zero.

- **Evidence Based Medicine (EBM) Assignment Paper**

Evidence-based medicine is the practice of medicine based on the best available evidence. Health professionals caring for children and adults need to be aware of the evidence about the benefits and harms of preventive methods, diagnostic strategies, treatments, and rehabilitation techniques in order to provide optimal care to their patients. For this assignment, students will examine the evidence in the literature by critically reviewing an original research article where the researchers have examined how musculoskeletal anatomy or posture related issues could influence an individual's risk developing an injury or pathology. Some examples include

- Influence of quadriceps muscles strength and knee injury risk
- Effects of lumbar spine posture and low back pain
- Do different running patterns affect ankle injury risk?
- Does a medial foot wedge affect heel pain?

Finding Articles:

1. Go to <http://library.gmu.edu/>
 - a. George Mason University has subscriptions and access to a wide range of journals and databases. You have the best chance of accessing an article going this route. If you go directly to a database or journal, you may not have access to the desired article. If you find an article but cannot get access to it, please email Dr. Ambegaonkar.
2. Search articles and use filters to meet all the criteria below
3. Print the article or download PDF so that you can upload it with your paper

Selection Guidelines:

- From a peer-reviewed journal (e.g. Journal of Athletic Training, American Journal of Sports Medicine)
- Must be less than 10 years old
- Must be Original research. Hint: Look to see whether it has sections labeled "Methods" or "Procedures", not meta-analysis, systematic review, or literature review
- Must have FULL-text, not just the abstract

Presentation and Format:

1. The assignment must be: no more than two-pages in length, 12-point Times New Roman font, double-spaced, with 1" margins. Make sure your review is thorough and concise.
2. No two students are allowed to review the same article. Choose an article on a topic that you are interested in. Even if two students are interested in the same topic, surely, there are many articles available so that two students can cover different facets of the same topic.
3. For full credit, please see the rubric below for the grading scale.

Grading Rubric:

1. *Selection Guidelines (10 points)*
 - a. Appropriate article chosen with the guidelines stated under "Article guidelines"
2. *Presentation and Format (10 points)*
 - a. Constructed with the guidelines stated under "Presentation and Format" (5 points)
 - b. Grammar, spelling, and writing technique (5 points)
 - i. Writing should be college-level writing, concise, and critical.
3. *Content Summary (20 points)*
 - a. Introduction (5 points)

- i. What is the background of the study?
 - ii. What is the purpose of the study?
 - b. Methods (5 points)
 - i. What were the methods used in this study?
 - ii. Include VERY brief information here and minimal information on sample demographics
 - iii. What is a quick summary of the protocol used for this study?
 - c. Results (5 points)
 - i. Summarize the findings and interpretations
 - ii. Do not explain the statistics
 - d. Conclusions (5 points)
 - i. What were the main conclusion(s) of the study? Did it support or refute the original hypothesis?
 - ii. What are the implications for further research?
- 4. *Critical Review (10 points)* –
 - a. Clinical application (5 points)
 - i. How can this information be used in in clinical practice?
 - ii. How does this information contribute to the body of knowledge AND how can you implement it?
 - b. Criticism (5 points)
 - i. Not all studies are done perfectly. What are your criticisms about this study? (NOTE: a critical reviewer must have expert knowledge in the field, methods, and research process. Since you are still developing these skills, please try to think of some ideas that the researchers could use to improve their study or other researchers looking to replicate the study.)

Submission Guidelines: Due date: The assignment has to be completed and turned in online on Blackboard by **6/16/2021 11.59 pm**. Assignments handed in after the deadline will automatically get a grade of zero.

- **Evidence Based Medicine (EBM) Assignment Oral Presentation**

For this assignment, students will submit a formal oral presentation with appropriate slide show (e.g. PowerPoint). The topic will be the same as the paper.

Submission Guidelines: Due date: The assignment has to be completed and turned in online on Blackboard by **6/16/2021 by 11.59 pm**. Assignments handed in after the deadline will automatically get a grade of zero.

Grading

ASSESSMENT METHOD	NUMBER	POINTS EACH	POINTS TOTAL
Examinations	5	50	250
Participation	10	5	50
Palpation Examination	2	50	100
Student Work Book	NA	Complete/Incomplete	100
Motion Analyses Project	1	50	50
Evidence Based Medicine (EBM) Assignment Written Paper	1	50	50
Evidence Based Medicine (EBM) Assignment Oral Presentation	1	50	50
TOTAL	—	—	650

The student's final letter grade will be earned based on the following scale:

Points	Percentage	Grade
650-605	> 93	A+
604.5-585.5	93 to > 90	A
585-566	90 to > 87	A-
565.5-540	87 to > 83	B+

539.5-520.5	83 to > 80	B
520-501	80 to > 77	B-
500.5-475	77 to > 73	C+
474.5-455.5	73 to > 70	C
Less than 455	70 or less	F

Professional Dispositions

Students are expected to exhibit professional behaviors and dispositions at all times.

MEDICAL PROFESSIONALISM

It is critical each student conduct themselves in an appropriate manner and decorum fitting of a health care provider. Making light of injuries, conditions, or illnesses that is not respectful to the class, instructor, or patient study will not be tolerated. Submission of documents or assignments should not include personal information and comply with Health Insurance Portability & Accountability Act (HIPAA) regulations.

E-MAIL CORRESPONDENCE

Only messages that originate from a George Mason University address will be accepted. The following is an appropriate professional format:

Dear Dr. Ambegaonkar, (*Beginning salutation*)

I am looking forward to your class. (*Text body*)

Regards, (*Ending Salutation*)

First Name Last Name (*Your name*)

Tentative Class Schedule

Dates	TENTATIVE TOPIC	READING ASSIGNMENTS	Assignments Due
5/17-5/23 Online	Introduction / Review Basic Functional Anatomy	L: 1-144 TG: pg. 20-37, 42	Exams 1 (Ch 1-5) SWB: pg. 1-2
5/24-5/30 Online	Neck and Trunk Anatomy Upper Extremity Musculoskeletal Anatomy	L: 173-256 TG: pg. 46-50, 61-62, 65-66, 100-104, 108, 110-112, 116-120, 127-131, 149, 168, 170-173, 188-195, 196-223, 244-249	Exams 2 & 3 (Ch 6-12) SWB: pg. 26, 28-31, 38, 47-50, 52-55, 58-60, 69-70, 85, 87, 90-94, 119, 143
5/31-6/6 Online	Lower Extremity Musculoskeletal Anatomy, Posture and Gait	L: 257-388 TG: pg. 276-283, 296-99, 305, 344-347, 347-348, 392-392, pg. 246, 240-243	Exams 4 & 5 (Ch 13-19) SWB: pg. 143-148, 150-154, 163-165, 179, 181-183, 187-188
6/7 – 6/12 Lab	Palpation Introduction (6/7), Neck and Trunk (6/8), Shoulder (6/9), Elbow (6/10), Wrist/Hand (6/11), Hip (6/12)	TG: pg. 1-18 169, 175-187, 196-223, 244-249 TG: pg. 51-60, 67-99, 102-106, 274, 108-109, 113-130, 132-166	Motion Analyses Project Due 6/12/2021
6/14– 6/19 Lab	Knee (6/14), Foot (6/15)	TG: pg. 284-295, 306-342, 350-365, 371-391, 394-405	Evidence Based Medicine Assignment Due 6/16/2021
6/16 INOVA	INOVA Fairfax Cadaver Laboratory		
6/17 INOVA	INOVA Fairfax Cadaver Laboratory		
6/18 Lab	Lab Review		
6/19 Lab	Palpation Exam		SWB Due 6/19/2021
<p>L: Loudon, TG: Trail Guide, SWB: Student Work Book, Lab = Hands on Laboratory in KJH 148 – 9.30 am-12.00 pm, INOVA = Cadaver Hands on Laboratory at Advanced Surgical Technology and Education Center (ASTECC) Department of Surgery, 3300 Gallows Road, Falls Church, VA 22042 – 9.30 am-12.30 pm*The page numbers may differ based on edition, so refer to the topic</p>			

Note: Faculty reserves the right to alter the schedule as necessary, with notification to students.

Core Values Commitment

The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: <http://cehd.gmu.edu/values/>.

GMU Policies and Resources for Students

Policies

- Students must adhere to the guidelines of the Mason Honor Code (see <http://oai.gmu.edu/the-mason-honor-code/>).
- Students must follow the university policy for Responsible Use of Computing (see <http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/>).
- Students are responsible for the content of university communications sent to their Mason email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students solely through their Mason email account.
- Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see <https://ds.gmu.edu/>).
- Students must silence all sound emitting devices during class unless otherwise authorized by instructor.

Campus Resources

- Questions or concerns regarding use of Blackboard should be directed to <https://its.gmu.edu/knowledge-base/blackboard-instructional-technology-support-for-students/>.
- For information on student support resources on campus, see <https://ctfe.gmu.edu/teaching/student-support-resources-on-campus>

Notice of mandatory reporting of sexual assault, interpersonal violence, and stalking:

As a faculty member, I am designated as a “Responsible Employee,” and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason’s Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason’s confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek assistance from Mason’s Title IX Coordinator by calling 703-993-8730, or emailing titleix@gmu.edu.

For additional information on the College of Education and Human Development, please visit our website <https://cehd.gmu.edu/>.