

**University of Texas at El Paso  
College of Health Sciences  
Physical Therapy Program**

**PT6407**

**Title of Course: Medical Kinesiology & Motion Analysis**

**2026**

**COURSE SYLLABUS**

**Credit Hours:** Four (4)

**Contact Hours:** Total: 90 hours (45 hours lecture, 45 hours lab)  
Lecture: 3 hours/week; Lab: 3 hours/week

**Schedule:** Lectures:

Mondays 10:30a - 12:00p

Tuesdays 10:30a - 12:00p

Labs:

Lab B on Wednesdays 1:30- 4:30p

Lab A on Thursdays 1:30p – 4:30p

Location: All lectures and labs in Mesa 120

**Instructors:**

Samuel Singleton, PT, DPT, OCS, SCS

Office location: Rehabilitation Science Complex Rm 115

Phone #: 443-474-6773

E-mail: [stsingleton@utep.edu](mailto:stsingleton@utep.edu)

Office hours: By appointment only

Kosaku Aoyagi, PT, MSc, PhD

Office location: Rehabilitation Science Complex Rm 115

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Priyanka Rana, PT, PhD

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Isabel Valdez, DPT

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Office hours: By appointment only

**Course Description:** Medical Kinesiology and Motion Analysis (3-3). The kinematics and kinetics of the human body, postural control, and the basics of gait analysis are comprehensively studied. Biomechanical principles that control human movement are applied to motion analysis.

**Course Objectives:** *Upon completion of this course, the student should be able to:*

1. Identify the kinesiological and biomechanics principles that create and govern human movement. (7A Kinesiology; 7A Biomechanics) [Application]
2. Apply osteokinematic and arthrokinematic principles that govern movement at each diarthrodial joint in open and closed chain function. (7A Kinesiology) [Application]
3. Apply biomechanical rules to calculate muscle and joint reaction forces, and direct efficient external loads and forces. (7A Kinesiology; 7A Biomechanics) [Application]
4. Analyze force vectors related to anatomical origins and insertions to determine individual, agonistic and antagonistic muscle contribution to functional human movement, including gait. (7A Kinesiology; 7D19i) [Application]
5. Identify motion restraints, both dynamic and static, that help control human movement at all joints, including gait. (7A Kinesiology; 7D19i) [Application]
6. Identify anatomical characteristics and anatomical structures including bony prominence, origin, insertion, muscle, and ligament, which influence human movement. (7A Anatomy) [Comprehension]
7. Match all joints in the human body with joint type, lever, degrees of freedom and axes of rotation. (7A Kinesiology) [Comprehension]
8. Identify potential joint and soft tissue consequences to altered posture related to static activities and positions. (7A Kinesiology; 7D19r) [Application]
9. Demonstrate osteokinematic and arthrokinematic rules, joint gliding force vectors, and tissue restraint loading related to arthrodiaral joints using human subjects or joint models. (7A Kinesiology; 7D19k; 7D27f) [Application]
10. Access, critically analyze, and summarize scientific literature related to kinesiological concepts and joint systems. (7C1) [Evaluation]

**UTEP DPT Curricular Threads:**

**Cultural / Linguistic Engagement and Competence:**

Students will practice using Spanish Language in select portions of at least 3 laboratory sessions. These sessions will be led by fluent Spanish speakers in the cohort.

**Clinical Reasoning:**

Apply kinesiological knowledge and principles to functional movement patterns in exams and skills checks. Analyze movement patterns at multiple joint systems to discern where tissue stress or limitation may be present in exams and skills checks.

**Interprofessional Collaborative Practice:**

None

**Course Prerequisites for DPT Students:** The UTEP DPT Program curriculum is a lock-step curriculum. Therefore, students must pass all courses in the prior semester of the DPT Program in order to enroll in courses in the subsequent semester. Faculty may consider exceptions for PT 6116 PT Capstone Project I and PT 6117 PT Capstone Project II.

**Methods of Instruction:** *Lecture/PowerPoint and Recordings, Text Reading, Group work and discussion, Video analysis, Peer motion analysis, Reading and Reporting of the Literature, Psychomotor Learning and Practice*

**Methods of Evaluation:** *Evaluation of learning will consist of exams, quizzes, lab skills check. Note: Written Examinations WILL Include Lab Content/Material*

<i>Exam 1:</i>	<i>10%</i>
<i>Exam 2:</i>	<i>15%</i>
<i>Exam3:</i>	<i>25%</i>
<i>Final Exam:</i>	<i>25%</i>
<i>Lab Skills Checks:</i>	<i>25%</i>

**UTEP PHYSICAL THERAPY PROGRAM GRADING SCALE**

The following letter grade scale is used for the UTEP Physical Therapy Program:

Letter Grade Scale	Numerical Grade Scale
A	90-100
B	80-89
C	75-79
F	Below 75

**Required Texts:** Required: Neumann DA. *Kinesiology of the Musculoskeletal System: Foundations for Rehabilitation*. 3rd ed. Mosby (Elsevier): 2016.

**Resources Available for Student Success:****Confidential Resources:**

**Center for Accommodations and Support Services (CASS):** If you have or suspect a disability and need accommodation, you should contact the Center for Accommodations and Support Services (CASS) at 747-5148. You can also e-mail the office at [cass@utep.edu](mailto:cass@utep.edu) or go by their office in Union Building

East, room 106 (next to the UTEP post-office). For additional information, visit the CASS website at <http://sa.utep.edu/cass>.

**The UTEP Student Health Center:** Union East Suite 100; 915.747.5624; [www.utep.edu/chs/shc](http://www.utep.edu/chs/shc)

**The UTEP Counseling and Psychological Services:** 202 Union West, 915.747.5302; [www.utep.edu/student-affairs/counsel](http://www.utep.edu/student-affairs/counsel)

**Additional Resources:**

Division of Student Affairs. 915.747.5076, [www.utep.edu/student-affairs](http://www.utep.edu/student-affairs)

DPT Library Research Guide: <http://libguides.utep.edu/pt>

Writing Center: 915.747.5112. <https://uwc.utep.edu>

Computer Labs: Independent Learning Center (ILC), 1<sup>st</sup> floor Campbell Building

Military Student Success Center: 915.747.5342, [www.utep.edu/student-affairs/mssc](http://www.utep.edu/student-affairs/mssc)

Student Wellness Program. 915.747.6738, [www.utep.edu/chs/wellness](http://www.utep.edu/chs/wellness)

**University Policies:** All students are responsible for following UTEP policies and procedures found in the Handbook of Operating Procedures at [www.utep.edu/vpba/hoop](http://www.utep.edu/vpba/hoop)

**Program Policies:** All DPT students are responsible for following all policies and procedures documented in the current DPT Student Handbook. Course policies found in the DPT Student Handbook apply to all courses in the DPT curriculum. The current DPT Student Handbook may be found on the DPT Student Resources site on Blackboard.

**Academic Integrity:** The UTEP DPT Program has a “zero tolerance policy” for scholastic dishonesty. DPT students must always demonstrate academic integrity. The current DPT Student Handbook outlines specific definitions, expectations, details, and consequences related to academic integrity and scholastic dishonesty. Additional information related to academic integrity is available through the UTEP Division of Student Affairs at [www.utep.edu/student-affairs/osccr/student-conduct/academic-integrity.html](http://www.utep.edu/student-affairs/osccr/student-conduct/academic-integrity.html)

**Course-Specific Policies:** See DPT Program Handbook for all policies on exams, electronic device use, dress code, attendance, and scholastic dishonesty. We encourage you to periodically review all handbook policies, but considering past experiences, we particularly direct you to review the policies on cheating, accumulated knowledge, professional behaviors/generic abilities, attendance, and the disclaimer that the syllabus is subject to change.

**Attendance/Tardiness:**

Attendance is expected; however, life happens. Therefore, **ONE excused absence of a single class\*** is permitted for *any* reason. For your first absence to be excused, you must meet the expectations described further down. HOWEVER (with very rare exception [eg, documented serious illness or emergency] that will be considered on a case-by-case basis) there will be NO accommodation offered for missed class time. Specifically, there is NO opportunity to make up in-class exams, either in advance of or after the scheduled class, or provide individual tutoring for missed content. Additionally late work caused by your absence will not be accepted. You should make prior arrangements with a classmate to find out what you missed, turn in any work, and/or pick up any handouts. **(\*NOTE: Single class is defined as 2 or 3 hours, including labs).**

**In order to be excused for your first missed class, you must do the following:**

Email the Kinesiology faculty at least 2 hours in advance if you will not be attending class. A message from one of your classmates is not acceptable.

If you miss a second (or more) class for any reason, it will be considered unexcused unless it is due to documented illness or emergency. In these cases, you should email and then arrange a meeting with upon your return to school to discuss why you missed the class. Documentation will be required for any additional absence (eg, doctor's note documenting illness or treatment). We will notify you after our meeting and review your documentation whether the absence will be considered excused or unexcused.

Missing 50% or more of a class will be considered an absence. Nevertheless, every class and lab count toward your learning! If you are only going to be able to attend 1 hour of a 3-hour lab, please do so, even though you will still receive an absence. For each incident of an unexcused absence, 5% will be deducted from your final semester grade.

**Late or Missed Assignments and Assessments Policy:** See current DPT Student Handbook "Written Examination Policy". Additional course-specific policy is as follows:

- No opportunities will be provided for missed examinations unless it is for an excused reason (eg, documented medical emergency).
- All written assignments are due at the date and time indicated. Assignments submitted after the deadline but on the due date will result in a 25% deduction due to the late submission. Assignments submitted after the due date will result in ZERO credit.

**Skills Check Policy:** See information from the UTEP DPT Student Handbook

**Course and Program Policy:**

Each student is responsible for reviewing and understanding all policies and procedures documented in the most current DPT Student Handbook for his/her cohort. Course policies found in the DPT Student Handbook apply to all courses in the DPT curriculum. The current DPT Student Handbook for each cohort may be found on the DPT Student Resources site on Blackboard. The course policies include very important information

about: Written/Computer-based examinations, practical examinations, attendance and participation, professional behavior, academic integrity, accumulated knowledge, and use of electronic devices.

**Special Accommodations (ADA):**

“If you have or suspect a disability and need accommodations, you should contact the Center for Accommodations and Support Services (CASS) at 747-5148.” You can also e-mail the office at [cass@utep.edu](mailto:cass@utep.edu) or go by their office in Union Building East. For additional information, visit the CASS website at <http://sa.utep.edu/cass/>

**Exams**

Throughout the semester, there will be 3 exams. The quizzes will be 10-15 questions each. Each exam will be over the content covered in prior lectures/labs and will not be comprehensive, meaning content covered for exam 1 will not be on exam 2. Exam questions will be based upon readings, lectures/labs, and materials provided on the blackboard course. Questions may involve clinical scenarios to develop clinical reasoning skills and application of knowledge from prior courses along with the current course's content. The final exam is comprehensive.

**Assignments**

Throughout the semester, there is the possibility of a variety of required assignments designed to reinforce lecture and lab content and promote application of course concepts. At the instructor’s discretion, some assignments may also be used as opportunities for extra credit, or as part of the method of evaluation, with specific criteria and weighting to be determined and communicated during the semester. All assignment expectations and evaluation methods will be provided in advance through Blackboard or in class.

**Course Content:** *Please Refer to Topic Outline Below:*

**Med Kinesiology PT 5407 Schedule and Due Dates  
Spring Semester 2025: UTEP DPT**

**Tentative Topics for Classroom Learning**

<b>Date</b>	<b>Time</b>	<b>Topic</b>	<b>Reading Assignment</b> (Readings may be added/or changed at the discretion of the instructor)	<b>Course Objective:</b> <b>Please see Syllabus</b>
Week 1: January 20- 23	<u>Lecture:</u> Jan 20 <sup>th</sup> : 10:30-12:00pm <u>Lab:</u>	<u>Lecture</u> Mod 1: Background Getting Started and Joint Systems <u>Lab:</u> Mod 2: Joint Systems Cont.	Neumann Chapter 1-2	1,2

	B: Jan 21st 1:30-4:30pm A: Jan 22 <sup>nd</sup> 1:30-4:30pm	<b>[VALDEZ]</b> <u>Lab:</u> Joint Systems <b>[VALDEZ/AOYAGI]</b>		
Week 2: January 26-30	<u>Lecture:</u> Jan 26 <sup>th</sup> 10:30-12pm Jan 27 <sup>th</sup> : 10:30-12pm <u>Lab:</u> B: Jan 28th 1:30-4:30pm A: Jan 29 <sup>th</sup> 1:30-4:30pm	<u>Lecture:</u> Module 3 & 4: Biomechanics Part 1 and 2 Module 5: Muscular Systems <b>Assignment due on 1/31 on Bb</b> <b>[VALDEZ]</b> <u>Lab:</u> Muscular System, Mastication and Ventilation, Biomechanics Review <b>[VALDEZ/SINGLETON]</b>	Neumann Chapter 3-4	1,3,4
Week 3: February 2-6	<u>Lecture:</u> Feb 2 <sup>nd</sup> 10:30-12pm Feb 3 <sup>rd</sup> : 10:30-12pm <u>Lab:</u> B: Feb 4 <sup>th</sup> 1:30-4:30pm A: Feb 5 <sup>th</sup> 1:30-4:30pm	<u>Lecture:</u> Mod 6: Ventilation/Mastication Module 28: Kinesiology of Running <b>[VALDEZ]</b> <u>Lab:</u> Ventilation/Mastication Module 28: Kinesiology of Running <b>[VALDEZ/SINGLETON]</b>	Neumann Chapter 11,16	2,4,5,6,7,8,9
Week 4: February 9-13	<u>Lecture:</u> Feb 9 <sup>th</sup> 10:30-12pm Feb 10 <sup>th</sup> : 10:30-12pm <u>Lab:</u> <b>A&amp;B Feb 12<sup>th</sup> 1-2:30pm</b>	<u>Lecture:</u> Module 7: Hip 1 Module 8: Hip 2 <b>[VALDEZ]</b> <b>Exam 1: Modules 1-6 (Wednesday Feb 12<sup>th</sup>)</b> <b>[TBD Proctor]</b>	Neumann Chapter 12	2,4,5,6,7,8
Week 5: February 16-20	<u>Lecture:</u> Feb 16 <sup>th</sup> 10:30-12pm Feb 17 <sup>th</sup> : 10:30-12pm <u>Lab:</u> <b>B: Feb 18<sup>th</sup> 1:00-5:00pm</b> <b>A: Feb 19<sup>th</sup> 1:00-5:00pm</b>	<u>Lecture:</u> Module 9: Knee 1 Module 10: Knee 2 <b>[VALDEZ]</b> <u>Lab:</u> Hip/Knee <b>[SINGLETON/VALDEZ]</b>	Neumann Chapter 13	2,4,5,6,7,8
Week 6: February 23-27	<u>Lecture:</u> Feb 23 <sup>rd</sup> 10:30-12pm	<u>Lecture:</u> Module 11: Foot Ankle 1 Module 12: Foot Ankle 2 <b>[VALDEZ]</b>	Neumann Chapter 14	2,4,5,6,7,8

	Feb 24 <sup>th</sup> : 10:30-12pm <u>Lab:</u> B: Feb 25 <sup>th</sup> 1:30-4:30pm A: Feb 26 <sup>th</sup> 1:30-4:30pm	<u>Lab:</u> Foot and Ankle <b>[VALDEZ/RANA]</b>		
Week 7: March 2-6	<u>Lecture:</u> Mar 2nd 10:30-12pm Mar 3 <sup>rd</sup> : 10:30-12pm <u>Lab:</u> B: Mar 4th 1:30-4:30pm A: Mar 5 <sup>th</sup> 1:30-4:30pm	<u>Lecture:</u> Mod 13: Normal Gait: Osteokinematics Mod 14: Normal Gait: Muscle Action and Rancho Mod 26: Abnormal Gait Mod 27: Abnormal Gait <b>[AOYAGI]</b> <u>Lab:</u> Gait Analysis Observation and Rancho Los Amigos <b>[AOYAGI/RANA]</b>	Neumann Chapter 15-16 Handouts/Video	2,4,5,6,7,8
Week 8: March 9-13	<u>Lecture:</u> Mar 9 <sup>th</sup> 10:30-12pm Mar 10 <sup>th</sup> : 10:30-12pm <u>Lab:</u> B: Mar 11 <sup>th</sup> 1:30-4:30pm A: Mar 12 <sup>th</sup> 1:30-4:30pm	<u>Lecture:</u> Mod 15: Lumbar 1 Mod 16: Lumbar 2 <b>Exam 2: Modules 7-12 (Tuesday March 10<sup>th</sup>)</b> <b>[RANA]</b> <u>Lab:</u> Lumbar <b>[RANA/SINGLETON]</b>	Neumann Chapter 9-10	2,4,5,6,7,8
<b>March 16-20</b>		<b><u>SPRING BREAK NO CLASSES</u></b>		
Week 9: March 23-27	<u>Lecture:</u> Mar 24 <sup>th</sup> 10:30-12pm Mar 25 <sup>th</sup> : 10:30-12pm <u>Lab:</u> <b>Combined Lab A&amp;B Mar 26<sup>th</sup> 1:30-4:30</b> <b>Skills Check Mar 27<sup>th</sup> 1-5pm</b>	<u>Lecture:</u> Module 17: Sacroiliac Joint <b>[SINGLETON]</b> <u>Lab :</u> SI Joint <b>Practice for skills check Lab A&amp;B</b> <b>Thursday - Skills Check (LE, Normal Gait, Respiration and Mastication)</b> <b>[SINGLETON/AOYAGI/VALDEZ/RANA]</b>	Neumann Chapters 9, 10	2,4,5,6,7,8
Week 10: March 30-April 3	<u>Lecture:</u> Mar 30th 10:30-12pm March 31 <sup>st</sup> : 10:30-12:00pm	<u>Lecture:</u> Module 18: CT Spine 1 Module 19: CT Spine 2 <b>[RANA]</b> <u>Lab:</u>	Neumann Chapter 9-10	2,4,5,6,7,8

	<u>Lab:</u> B: Mar 31 <sup>st</sup> 1-4:00pm A: April 2 <sup>nd</sup> 1:30-4:30pm	CT Spine <b>[AOYAGI/RANA]</b>		
Week 11: April 6-10	<u>Lecture:</u> April 6 <sup>th</sup> 10:30-12pm April 7 <sup>th</sup> : 10:30-12:00pm <u>Lab:</u> B: April 8 <sup>th</sup> 1-4:00pm A: April 9 <sup>th</sup> 1:30-4:30pm	<u>Lecture:</u> Module 20: Shoulder 1 Module 21: Shoulder 2 <b>Exam 3: Modules 13-17 &amp; 26-27 (Tuesday April 7<sup>th</sup>)</b>  <b>[RANA]</b> <u>Lab:</u> Shoulder <b>[RANA/AOYAGI]</b>	Neumann Chapter 5	2,4,5,6,7
Week 12: April 13-17	<u>Lecture:</u> April 13 <sup>th</sup> 10:30-12pm April 14 <sup>th</sup> : 10:30-12:00pm <u>Lab:</u> B: April 15 <sup>th</sup> 1:30-4:30pm A: April 16 <sup>th</sup> 1:30-4:30pm	<u>Lecture:</u> Module 22: Elbow/Forearm 1 Module 23: Elbow/Forearm 2 <b>[RANA]</b> <u>Lab:</u> Elbow and Forearm <b>[AOYAGI/RANA]</b>	Neumann Chapter 6	2,4,5,6,7,8
Week 13: April 20-24	<u>Lecture:</u> April 20 <sup>th</sup> 10:30-12pm April 21 <sup>st</sup> : 10:30-12:00pm <u>Lab:</u> B: April 22 <sup>nd</sup> t 1:30-4:30pm A: April 23 <sup>rd</sup> 1:30-4:30pm	<u>Lecture:</u> Module 24: Wrist Module 25: Hand <b>[RANA]</b> <u>Lab:</u> Wrist and Hand <b>[SINGLETON/RANA]</b>	Neumann Chapter 7 Neumann Chapter 8	2,4,5,6,8
Week 14: April 27- May 1	<u>Lecture:</u> TBD <u>Lab:</u> TBD	<u>Lecture:</u> Optional: Review <b>[SINGLETON]</b> <u>Lab:</u> TBD		
Week 15: May 4-8	<u>Lecture:</u> TBD <u>Lab:</u> <b>May 6<sup>th</sup> 1--5pm</b> <b>- Final Skills Check</b>	<u>Lecture:</u> <b>[SINGLETON]</b>  <b>Optional: Review</b> <b>Wednesday - Skills Check B: UE, Abnormal Gait COMPREHENSIVE</b>		

Finals Week	9-11	FINAL Examination: Date TBD	CT Spine UE/ System, COMPREHENSIVE 65% New Material 35% Previous Material	