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

PT 6207  Motor Control and Motor Learning  Spring 2024

COURSE SYLLABUS

Credit Hours:  2

Contact Hours:  30 (15 weeks)

Schedule:  - Tuesdays, 10:30-12:30pm
- Mesa Building 120 (please see schedule below)

Coordinator/Instructor:  Camila Torriani-Pasin, Ph.D.
Office:  3333 N. Mesa building (115C)
Office hours:  by appointment
Phone:  Ext #8629
E-mail (best way to reach me):  ctorrianip@utep.edu

Course Description: The neural, physical, and behavioral processes that govern human motor performance across the lifespan are studied. Theories of motor learning and re-learning following trauma are emphasized, with attention given to how intervention and feedback variables impact the learning process. Factors that influence postural control and gait during life are addressed.

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.

Course Objectives for PT 6207 Motor Control and Motor Learning
1. Identify the theoretical framework of motor control and learning. (7A: Neuroscience; 7B: Teaching and Learning) [Comprehension]
2. Define key neuroscientific principles and anatomical influences underlying motor control and motor learning. (7A: Neuroscience) [Comprehension]
3. Identify the sequence of motor development for mobility and posture control. (7A: Neuroscience; 7C: Nervous System) [Comprehension]
4. Identify components of normal and abnormal gait patterns and their related mechanisms. (7A: Anatomy, Neuroscience; 7C: Nervous System) [Comprehension]
5. Explain the elements of the motor function examination. (7A: Neuroscience; 7D19n) [Comprehension]
6. Identify the functional consequences of deficits in motor planning. (7A: Neuroscience) [Comprehension]
7. Differentiate between different teaching and learning styles (7B: Teaching and Learning) [Analysis]

Curricular Threads:

- **Cultural / Linguistic Engagement and Competence:**
  - N/A

- **Evidence-Based Practice and Research:**
  - Students are assigned to read current evidence (e.g., Kleim and Jones; Weinstein) and then apply the evidence as part of their clinical decision-making.

- **Clinical Reasoning:**
  - Clinical reasoning is addressed throughout the course with students using videos of patients including human movement analysis of gait, mobility, and postural control cases. The main purpose is to identify a range of deficits, relevant assessments, and interventions to each case scenario.

- **Interprofessional Collaborative Practice:**
  - The importance of interprofessional communication and collaboration among OT, PT, and SLP in Motor Control settings is addressed. Motor control and learning are central knowledge to both professionals and during the course we cover the specifics of each one through case discussions.

Methods of Instruction: Lectures, internet search and retrieval through database access, case-based activities, video discussions, scientific article readings, and other active learning assignments as indicated.

Methods of Evaluation: Evaluation of course content will consist of three exams, three quizzes and three assignments. A minimum average of 75% is needed to pass the course with a grade of “C.” Graded activities and their weight are as follows:

<table>
<thead>
<tr>
<th>Graded Components</th>
<th>% final grade</th>
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<tbody>
<tr>
<td>Quizzes (5% each)</td>
<td>15%</td>
</tr>
<tr>
<td>Assignments 1 and 2 (10% each) - Team</td>
<td>20%</td>
</tr>
<tr>
<td>Assignment 3 (self-reflection) - Individual</td>
<td>5%</td>
</tr>
<tr>
<td>Exams 1, 2, 3 (20% each)</td>
<td>60%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

*If you are consistently performing below 80% you are required to arrange a meeting with the instructor to develop study strategies for performance improvement.

Exams, individual assignments, and team assignments make up the student assessment of knowledge. Late assignments will result in grade deductions. Percentage deductions vary on the assignment and how late submitted. **NO ASSIGNMENTS ACCEPTED IF MORE THAN 48 HRS LATE.** It is the student’s/team’s responsibility to stay on top of deadlines and manage time appropriately.
The following letter grade scale is used for the UTEP Physical Therapy Program:

<table>
<thead>
<tr>
<th>Letter Grade Scale</th>
<th>Numerical Grade Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90-100</td>
</tr>
<tr>
<td>B</td>
<td>80-89</td>
</tr>
<tr>
<td>C</td>
<td>75-79</td>
</tr>
<tr>
<td>F</td>
<td>Below 75</td>
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Required Textbook:


With the following link you will have a discount in case you want to obtain the hardcopy of the textbook:

https://lippincottdirect.lww.com/MedicalEducation-UniversityOfTexasElPaso-Spring2023

Resources Available for Student Success:

Confidential Resources:

- **Center for Accommodations and Support Services (CASS):** 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 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

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

Additional Resources:

- Division of Student Affairs. 915.747.5076, 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), 1st floor Campbell Building
- Student Wellness Program. 915.747.6738, 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
**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 demonstrate academic integrity at all times. 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:**

1. **Attendance Policy - Absences:** Refer to current DPT Student Handbook “Attendance and Classroom Behavior” for the DPT Program policy.
   - As a student enrolled in a professional program, it is also expected that every student will be seated and attentive as soon as class begins. Tardiness is unprofessional and impacts your fellow peers by interrupting the classroom dynamics.
   - Attendance is expected weekly. Therefore, **no absences are allowed.** However, with very rare exception (e.g., documented serious illness or emergency), the absence will be considered on a case-by-case basis. There will be NO accommodations offered for missed class time. Specifically, there is NO opportunity to make up 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 and this could affect your team performance.
   - If you miss a class for any reason, it will be considered unexcused unless it is due to documented illness or emergency. In these cases, you should email me and then arrange a meeting with me upon your return to school to discuss why you ([ctorrianip@utep.edu](mailto:ctorrianip@utep.edu)) within 24 hours of the missed class. Documentation will be required for any additional absence (e.g., doctor’s note documenting illness or treatment). I will notify you via e-mail and review of your documentation whether the absence will be considered excused or unexcused.
   - Missing 50% or more of a class will be considered an absence.
   - For each incident of an unexcused absence, 5% will be deducted from your final semester grade.

2. **Attendance Policy - Tardiness & Early Departures:** Refer to current DPT Student Handbook “Attendance and Classroom Behavior” for DPT Program policy.

3. **Electronic Devices:** Refer to current DPT Student Handbook “Electronic Devices” for DPT Program policy.
   - All students must come to class with a laptop prepared to conduct various internet searches, quizzes, and assignments. If the student does not own a laptop, one will be provided by the ILC, but the student needs to inform the instructor 24 hours prior to class time to make arrangements for a laptop to be checked out through the ILC.
• If during the class time, students are found disengaged in the class assignment (e.g., on Facebook, studying for another course, etc.) the student will be told to leave the class. This will result in an unexcused absence, which will result in a 5% decrease in the final grade for the course.


5. **Late or Missed Assignments and Assessments Policy**: See current DPT Student Handbook “Written Examination Policy”.
   • Late assignments will result in grade deductions. Percentage deductions vary on the assignment and how late submitted. NO ASSIGNMENTS ACCEPTED IF MORE THAN 48 HRS LATE.

6. **Skills Check Policy**: NA

7. **Practical Exam Policy**: NA

**Course Content and Schedule**: (Note: Students will be notified of changes via Blackboard or email. Additional details may be available in supporting course documents provided by the course instructor).

**COURSE ASSIGNMENTS AND EVALUATION OF LEARNING**

Two assignments in this course are team-based assignments of 5-6 students. One assignment and all the quizzes are individual. Effective communication is key to a well-functioning team. Discuss and agree upon expectations for all members including meeting dates and times and division of roles when applicable.

It is every individual’s responsibility to work as a team. If expectations are not met, then the team is not effective. The entire team has the right to dismiss a team member for not meeting expectations, but there are consequences to the team as a whole. If a team member is found to be disruptive to the process, the individual can be dismissed for the one assignment and will earn a 0 for that assignment. However, the other members of the team will lose 10% of the team grade for not being able to resolve the issues. If a team member is determined to not meet expectations for the 2 assignments, then the student will lose a letter grade equivalent at the end of the course. It is in everyone’s best interest to work together effectively and efficiently.

**Chapter Quizzes**: There will be a quiz one class before the exam. The questions will be related to the ppt notes, textbook chapters, and classroom discussions. The purpose of the quizzes is to prepare you for the exams.
Assignments:

Assignment 1 – team-based
Below you will find two references related to Motor learning and neuroplasticity principles. The articles will be posted on BlackBoard. Your team must select one of your favorites to go deeper into the reading.

Winstein et al, 2014. Infusing Motor Learning Research into Neurorehabilitation Practice: A Historical Perspective with Case Exemplar From the Accelerated Skill Acquisition Program.

Kleim and Jones, 2009. Principles of Experience-Dependent Neural Plasticity: Implications for Rehabilitation After Brain Damage

Each member of the team will carefully read the paper. The group will present the principles of Neuroplasticity and/or Learning mentioned by the authors. Then, you will provide one clinical example about how to apply each principle in clinical practice. Try to be as specific as possible with your example, including the patient’s health condition, the purpose of the treatment strategy, and the clinical example of how to apply the principle. This assignment should be no more than 3 pages. You can use tables or images to clarify the examples if needed.

Assignment 2 – team-based
Perform an Observational Gait Analysis on a "patient" with a neurological disorder. You can use case study from the textbook videos or find a you tube video of a patient with a neurologic disorder. Complete the Rancho Los Amigos gait analysis form. You can find a copy of the form in Modules - Blackboard. Provide at least TWO recommended treatment interventions you would use to improve the patient’s gait pattern. Provide the reference/link for the video.

Assignment 3 - individual
Reflection paper: Reflect back on the entire course and think about the concepts or ah-ha moments you might have had in the class. What were those things that really hit home for you? Please share at least 3 concepts or ah-ha moments in the class and explain why they stand out to you and how you plan to use these in the future. I am leaving this intentionally a bit vague as I don't want to lead you - I really want you to think about what those moments of learning and growth for you in this course and content area were. Please keep your response to 2 pages at max.

Exams: Three Exams will be administered. Conflicts with the exam dates must be brought up at least 1 week in advance to the instructor for accommodation. Conflicts notified after this period will not be accommodated. The exams will be closed note/closed book and taken on Respondus lockdown browser webcam enabled.
Unit 1: Theoretical Framework/ Physiology & Constraints to Motor Control
  Chapter 1: Motor Control: Issues and Theories
  Chapter 2: Motor Learning and Recovery of Function
  Chapter 3: Physiology of Motor Control
  Chapter 4: Physiological Basis of Motor Learning and Recovery
  Chapter 5: Constraints on Motor Control
  Chapter 6: Conceptual Framework for Clinical Practice

Unit 2: Postural Control
  Chapter 7: Normal Posture Control
  Chapter 8: Development of Postural Control
  Chapter 9: Aging and Postural Control
  Chapter 10: Abnormal Postural Control
  Chapter 11: Management of the Patient with a Postural Control Disorder

Unit 3: Mobility
  Chapter 12: Control of Normal Mobility
  Chapter 13: Development of Mobility
  Chapter 14: Aging and Mobility
  Chapter 15: Abnormal Mobility
  Chapter 16: Management of the Patient with a Mobility Disorder

This is a “living syllabus” schedule may have subtle changes during this semester.
You will be informed on time through BlackBoard.

| Week 1  | January 16 | - Welcome / Introduction  
|         |            | - Motor Control: Issues and Theories |
| Week 2  | January 23 | - Motor Learning and Recovery of Function |
| Week 3  | January 30 | - Physiological Basis of Motor Learning and Recovery |
| Week 4  | February 06| - Constraints on Motor Control |
| Week 5  | February 13| - Conceptual Framework for Clinical Practice |

<table>
<thead>
<tr>
<th>Reading</th>
<th>Room</th>
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<tbody>
<tr>
<td>Chapter 1</td>
<td>Mesa Building 120</td>
</tr>
<tr>
<td>Chapter 2</td>
<td>Mesa Building 120</td>
</tr>
<tr>
<td>Chapter 4</td>
<td>Mesa Building 120</td>
</tr>
<tr>
<td>Chapter 5</td>
<td>Mesa Building 120</td>
</tr>
<tr>
<td>Chapter 6 Videos</td>
<td>Mesa Building 120</td>
</tr>
</tbody>
</table>
| Week 6 | February 20 | - Quiz 1  
- Assignment 1  
(Due date to submit it) | Kleim and Jones, 2008  
Winstein et al, 2014 | Mesa Building 120 |
| Week 7 | February 27 | - UNIT 1 Exam (1,2,4,5-6) |  | Mesa Building 120 |
| Week 8 | March 5 | - Normal Posture Control | Chapter 7 | Mesa Building 120 |
| Week 9 | March 12 | Spring Break |  |  |
| Week 10 | March 19 | - Development of Postural Control  
(Dr Manning) | Chapter 8 | Mesa Building 120 |
| Week 11 | March 26 | - Aging and Postural Control  
- Abnormal Postural Control | Chapter 9 and 10 | Mesa Building 120 |
| Week 12 | April 2 | - Management of the Patient with a Postural Control Disorder  
- Quiz 2 | Chapter 11 | Mesa Building 120 |
| Week 13 | April 9 | - UNIT 2 Exam (7-11) |  | Mesa Building 120 |
| Week 14 | April 16 | - Control of Normal Mobility | Chapter 12 | Mesa Building 120 |
| Week 15 | April 23 | - Aging and Mobility  
- Abnormal Mobility | Chapter 14 and 15 | Mesa Building 120 |
| Week 16 | April 30 | - Management of the Patient with a Mobility Disorder  
- Quiz 3  
- Due date Assignment 2: May 3 | Chapter 16 | Mesa Building 120 |
|          |           | Due date Assignment 3: May 5 |  |  |
| Week 17 | May 9 (Thursday) | - UNIT 3 Exam (12, 14, 15, 16) |  | Mesa Building 120 |