

**UNIVERSITY OF MASSACHUSETTS LOWELL  
COLLEGE OF HEALTH SCIENCES  
DEPARTMENT OF PHYSICAL THERAPY**

**I. Title: Research Methods in Physical Therapy 34.616.201**

Tuesday, Thursday 2:00 - 3:15 p.m.

Web site: <http://dptresearchmethods.wiki.uml.edu/>

**II. Course Description:**

This course presents the role of research in the development and critical analysis of physical therapy clinical practice. Students are guided through the process of clinical scientific research including the following content areas: philosophy of science & causation, problem and hypothesis identification, review and analysis of scientific literature, methods of hypothesis testing, data analysis and interpretation and critique/evaluation of research results

**III. Course Objectives:**

**The student will be able to:**

- A. Identify the role of research in developing scientific and theoretical foundations of physical therapy practice and critical analysis of physical therapy practice.
- B. Define and explain the use of inductive, deductive, abductive and statistical inference in research and clinical practice.
- C. Explain causation and criteria applied when evaluating causal inference.
- D. Describe the scientific process and components of a research proposal/study.
- E. Explain the ethical and legal issues of human experimentation.
- F. Critically evaluate a research article including the research questions, hypothesis, research design, data collection, analyses, interpretation of the results, and clinical application.
- G. Explain how a physical therapist can utilize research in clinical practice.

**IV. General Information:**

**A. Time Allotment:** Lecture: 3 hours of lecture per week  
Tuesday and Thursday 2:00 – 3:15 pm  
**Credit hours: 3**

**B. Placement:** Spring semester – First year, DPT Program

**C. Attendance:** Attendance at all class meetings is mandatory. Unexcused absences will result in a reduction of final grade. Active participation in class is expected. Students missing class for religious holidays or excused absences will be responsible for the work missed. Students must speak to the professor before missing the scheduled class.

**D. Faculty:** Sean Collins, PT, ScD  
O’Leary Library, Room 540K (Office hours as posted)  
[Sean\\_Collins@uml.edu](mailto:Sean_Collins@uml.edu) 978-934-4375

Yi-Ning Wu, PhD  
O’Leary Library, Room 540F (Office hours as posted)  
[YiNing\\_Wu@uml.edu](mailto:YiNing_Wu@uml.edu) 978-934-6456

**E. General Teaching Methods and Learning Experiences:**

Lectures, demonstrations, discussions, audiovisual materials, readings, handouts, examinations.

**F. Evaluation Methods:**

Exam 1: 50 points

Final Exam: 50 points

Students are reminded that maintenance of a cumulative grade point average of B or above is necessary to continue in the University of Massachusetts Lowell DPT program. No more than nine credits of C, C+ or B- may be counted toward the DPT degree. Making-up policy: Make-up examinations will be given only in the specific event of documented illness, death in the family, or religious holidays. Faculty must be notified prior to scheduled time of the examinations.

**V. Grading Policy:**

A+ = 4.0	97-100
A = 4.0	93 - 96
A- = 3.7	90 - 92
B+ = 3.3	87 – 89
B = 3.0	83 – 86
B- = 2.7	80 – 82
C+ = 2.3	77 - 79
C = 2.0	73 – 76

The instructor reserves the right to change a student's final grade as much as 10% (higher OR lower) based on the instructor's evaluation of the student's professional behavior.

**VI. Course Requirements:**

- A. Successful completion of all exams, and written assignments.
- B. Completion of assigned readings prior to class lecture/discussion.
- C. Class attendance and active participation in class in a professional manner (see generic abilities).

**VII. Required Text:**

**Essentials of Rehabilitation Research: A Statistical Guide to Clinical Practice**, FA Davis, 2012  
Richard Di Fabio

**VIII. Student Responsibilities:**

All students are expected to attend class and be punctual. It is expected that all students will demonstrate professional behavior at all times. Students are expected to adhere to departmental/institutional policies. On any given day if a student is disrespectful or disruptive and is asked by the instructor to leave, the student is not to return to the class until meeting with the instructor and academic advisor.

**IX. Dishonesty and Cheating Statement:**

All students are advised there is a University policy regarding dishonesty and cheating, and a department Honor Code. It is the students' responsibility to familiarize themselves with these policies and to adhere to the Honor Code. University policies will be strictly enforced. If necessary, contact the instructor or your advisor for clarification of these policies.

**Graduate Academic Integrity Policy can be located at:**

[http://www.uml.edu/catalog/graduate/policies/academic\\_dishonesty.htm](http://www.uml.edu/catalog/graduate/policies/academic_dishonesty.htm)

**X. Special Accommodations:**

If a student needs special accommodations under the Americans with Disabilities Act in order to achieve course objectives and/or requirements, it is the student's responsibility to contact the faculty advisor and provide documentation from the Office of Disability Services within two weeks of receiving this syllabus.

Note: "Federal regulation defines a credit hour as an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutional established equivalence that reasonably approximates not less than-

- (1) One hour of classroom or direct faculty instruction and a minimum of two hours out of class student work each week for approximately 15 weeks for one semester or trimester hour of credit, or the equivalent amount of work over a different amount of time; or
- (2) At least an equivalent amount of work as required in paragraph (1) for other activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours" (New England Association of Schools and Colleges, Commission on Institutions of Higher Education, *Policy on Credits and Degrees*, Effective July 1, 2011).

**Schedule**

Week	Tuesday	Thursday
1	Causation & reasoning: Hill's criteria for causation; deductive, inductive, abductive inference Dr. Collins	Statistical Inference, central limit theorem, probability Dr. Collins
2	Statistical Inference, standard deviation, standard error, p value, confidence intervals Dr. Collins	Statistical Inference, standard deviation, standard error, p value, confidence intervals Dr. Collins
3	Comparing Clinical Assessments, Chapter 5 Dr. Wu	Comparing Clinical Assessments, Chapter 5 Dr. Wu
4	Clinical Practice: Contingency Tables Chapter 2 – Dr. Collins	Clinical Practice: Contingency Tables Chapter 2 – Dr. Collins
5	<i>No Tuesday Class</i>	Assessing Meaningful Clinical Change, Chapter 4 -Dr. Collins
6	Assessing Meaningful Clinical Change, Chapter 4 -Dr. Collins	Association, Chapter 7 Dr. Collins
7	Association, Chapter 7 Dr. Collins	Diagnostic & Clinical Assessment DiFabio, Chapter 3 – Dr. Collins
8	Diagnostic & Clinical Assessment DiFabio, Chapter 3 – Dr. Collins	<b>Exam</b>
9	Spring break	Spring break
10	Consensus, Chapters 6 Dr. Wu	Consensus, Chapters 6 Dr. Wu
11	Prediction of Outcomes, Chapter 8 Dr. Wu	Prediction of Outcomes, Chapter 8 Dr. Wu
12	Identifying Responders, Chapter 9 Dr. Wu	Identifying Responders, Chapter 9 Dr. Wu
13	Outcomes over time, Chapter 10 Dr. Wu	Outcomes over time, Chapter 10 Dr. Wu
14	Research Design Dr. Wu	Research Design Dr. Wu
15	Clinical Practice Guideline, Chapter 11 Dr. Collins	<b>Exam</b>
<b>Finals</b>	<b>Final Exam</b>	