PHAR 7274: Biostatistics and Clinical Research Methods
Spring 2026

Course Description
This course introduces pharmacy students to the principles of applied biostatistics and research methods. The goal of this course is for the students to develop the ability to critically appraise health and drug literature to make evidence-based decisions in their practice

Additional Course Information
This course equips students with the knowledge and skills to interpret and critically evaluate quantitative findings in pharmacy and medical literature. Key topics covered include data summarization, hypothesis testing, statistical inference, and distinguishing between statistical and clinical significance in research. The course also explores fundamental aspects of research design and literature aggregation methods.

Course Credit
Two (2) credit hours

Pre-Requisites
None

Co-Requisites
None

Class Meeting Days, Time & Location
Thursday, 8:30 AM – 10:30 AM, W.T. Brookshire Hall, Room 133

Course Coordinator
Osama A. Shoair, Ph.D.
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Office hours: Tuesday and Thursday, 12:00 PM – 1:00 PM, and by appointment
Preferred method of contact: E-mail

Fisch College of Pharmacy (FCOP) and UT Tyler Policies
This is part 1 of the syllabus. Part 2 contains UT Tyler and the FCOP course policies and procedures.

Required Materials
Most course-required materials are available through the Robert R. Muntz Library. These materials are available either online (http://library.uttyler.edu/) or on reserve.

1. Malone PM, Malone MJ, Park SK. *Drug Information: A Guide for Pharmacists*. 7th ed. McGraw-Hill Education; 2022. ISBN: 978-1-260-46030-8.
2. Yang Y, West-Strum D. *Understanding Pharmacoepidemiology*. 1st ed. McGraw-Hill Education; 2011. ISBN: 978-0-07-163500-4.
3. Other required materials will be posted on the classes' Canvas site. The site address is http://uttyler.edu/canvas

Recommended Materials

None.

Course Format

The course may include, but is not limited to, the following activities:

1. Independent study of selected readings
2. Preclass assignments
3. Individual readiness assessment tests (iRATs)
4. Individual applications of content and concepts
5. Team-based assignments
    a. Team readiness assessment tests (tRATs)
    b. Team application of content and concepts
    c. Team presentation of content and concepts
6. Educational video clips (online and in class)
7. Journal Clubs

Course Learning Outcomes (CLOs)

CLOs	PLO(s) Assessed for this CLO (1-12)	ACPE Appendix 1	NAPLEX (1.1-6.5)	Assessment Methods (1-13)
1. Identify the appropriate statistical tests for various research questions and interpret their results	1, 2, 3	Biostatistics	1.7, 4.8	1
2. Differentiate between various research study designs and evaluate their strengths and limitations	1, 2, 3	Research Design	1.7, 4.8	1
3. Calculate and interpret measures of association between exposures and outcomes in research studies	1, 2, 3	Biostatistics Research Design	1.7, 4.8	1
4. Assess methodological issues in research studies and describe their impact on study outcomes	1, 2, 3	Research Design	1.7, 4.8	1
5. Distinguish between various literature aggregation methods and critically appraise their findings	1, 2, 3	Biostatistics Research Design	1.7, 4.8	1

Course Summative Assessment Methods

	Assessment Method	Description
1	Question-based examination (ExamSoft-based)	Standard multiple-choice, select all that apply, matching, ordered-response, hot spot, fill-in-the-blank, and short essay questions

Appropriate Use of Artificial Intelligence

AI is permitted only for specific assignments or situations, and appropriate acknowledgment is required. In this course, we may use AI tools (such as ChatGPT and Copilot) to examine how these tools may inform our exploration of the class topics. You will be notified as to when and how these tools will be used, along with guidance for attribution. Using AI tools outside these parameters violates UT Tyler's Honor Code, constitutes plagiarism, and will be treated as such.

Grading Policy & Grade Calculation

Grades will be determined based on the evaluation of assignments, formative assessments (for learning), and summative assessments (for mastery). Final examinations are synonymous with summative assessments. Assessments may consist of but are not limited to multiple-choice, true/false, fill-in-the-blank, short-answer, essay, and problem-based questions. They may also include a variety of formats beyond the traditional question-based written examination, as each CLO may require different methods to determine student achievement.

Assignments, formative assessments, and summative assessments may be **cumulative.** Students are responsible for material presented during prior courses. The grading scale for all graded material is below. The final course grade will be assigned according to the calculated percentage, and the percentages will not be rounded upward or downward. For additional information, see Part 2 of the syllabus.

During the time the course is in progress, students who obtain less than 75% on any summative assessment or a total course grade of less than 75% during a particular semester will receive an academic alert from the course coordinator and the Office of Academic Affairs and be subject to weekly in-course remediation with the course instructor(s).

Standard Grade Calculation*

Individual Assessments	**95%**
iRATs	5%
Individual Application Exercises	5%
Midterm Exam	40%
Final Exam	45%
Team Assessments	**5%**
tRATs	2%
Team Application Exercises	3%
TOTAL	**100%**

***The final course letter grade will be as follows:**

A	90 - 100 %
B	80 - 89.999 %
C	70 - 79.999 %
D	65.0 - 69.999 %
F	< 65.0 %

PHAR 7274 Course Schedule[#]
Spring 2026

Week	Day	Topic	Instructor	CLO
1	1/15	Biostatistics: Descriptive Statistics	Shoair	1
2	1/22	Biostatistics: Probability and Hypothesis Testing	Shoair	1
3	1/29	Biostatistics: Comparing Proportions	Shoair	1
4	2/5	Biostatistics: Comparing Means	Shoair	1
5	2/12	Biostatistics: Correlation and Regression	Shoair	1
6	2/19	Biostatistics: Logistic Regression and Survival Analysis	Shoair	1
7	2/26	Biostatistics: Power and Sample Size Biostatistics: Statistical Significance vs. Clinical Significance	Shoair	1
8	**3/5**	**Midterm Exam | 8:30 AM – 10:30 AM (Content covered from 1/15 to 2/26)**	Shoair	1
	3/12	**Spring Break: No Classes**		
9	3/19	Research Design: Fundamentals of Clinical Research	Shoair	2, 4
10	3/26	Research Design: Randomized-Controlled Trials	Shoair	2, 4
11	4/2	Research Design: Randomized-Controlled Trials Research Design: Observational Study Designs	Shoair	2, 3, 4
12	4/9	Research Design: Observational Study Designs	Shoair	2, 3, 4
13	4/16	Research Design: Equivalence and Noninferiority Trials	Shoair	2, 4
14	4/23	Research Design: Systematic Reviews and Meta-Analyses	Shoair	4, 5
15	**4/30**	**Final Exam | 9:00 AM – 12:00 PM (Content covered from 1/15 to 4/23)**	Shoair	1-5

[#]*Dates, topics, and assignments may be subject to change. You will receive advance notification of any changes.*