EPI 808 - Fall 2021 Introduction to Biostatistics I

Instructor: Ana I. Vázquez, PhD

Department of Epidemiology and Biostatistics.

B601 West Fee Hall Phone: +1.517.353.8623 Email: avazquez@msu.edu

Class meets. Mondays and Wednesdays 8:30 AM - 9:50 AM - Fee Hall E111

Office hours. Wednesdays 10:00 AM - 12:00 in 909 Wilson Road, Room B627.

Prerequisites. MTH 103, 110, 116, or LBS 117

Text. Rosner, B. "Fundamentals of Biostatistics, 7th Edition", Duxbury. Text is available online also.

Course. EPI 808 is designed for students in health sciences, but students from other disciplines are welcome to attend if they are adequately prepared. It is the first course in a two-course sequence (with EPI 809) in introductory probability and statistical inference for students without a background in calculus. EPI 808 covers descriptive statistics, basic probability theory, discrete and continuous distributions, estimation, and hypothesis testing. EPI 809 will include topics on ANOVA, linear regression, categorical data analysis, and logistic regressions.

The text covers most of the standard topics in an introductory course in Statistics. The course will cover the selected materials from the text. There are a very large number of exercises at the end of each chapter. These, and the examples in the text, emphasize biostatistical applications. Note the references in the Index of Applications to several areas in the health sciences. The exercises are usually direct applications of theory discussed earlier and can be carried out on a calculator. Few and introductory examples using statistical analysis software, such as R, will be provided in lecture notes.

Grading. Final grades will be based on the midterm exam (30%), the final exam (30%), and two short quizzes (10% each), and written homework (30%). There will be no make-up exams or quizzes (unless it is documented with medical conditions). Problems assigned for homework should be submitted for grading. A reasonable amount of collaboration on homework assignments is allowed, but each student must turn in written answers that reflect his or her own understanding of the material.

Academic integrity. All Michigan State University policies regarding academic integrity apply to this course. For details, see:

https://www.msu.edu/~ombud/academic-integrity/index.html

Software

There will be a limited use of R in class and optional/non-graded homework exercises.

R software R is an open source statistical analysis software, can be downloaded for free at http://www.r-project.org/

Installation guide: https://cran.r-project.org/doc/manuals/r-release/R-admin.pdf

Introduction guide: https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf

Tentative schedule

	Date	Topic	HW	Chapter
Week 1&2 (no class 9/6)	9/1, 9/8	Introduction and Descriptive Statistics	HW1: Ch2	2.1 - 2.8
Weeks 3 & 4	9/13, 9/15, 9/20, 9/22,	Probability	HW2: Ch3	3.1 - 3.10
Weeks 5 & 6	9/27(Quiz 1), 9/29, 10/4, 10/6	Discrete Probability Distributions	HW3: Ch4	4.1 - 4.13
Weeks 7	10/11, 10/13	Continuous Probability Distributions	HW4: Ch5	5.1 - 5.8
Week 8	10/18	MIDTERM (Chapters 1 to 5)		
Week 8	10/20	Midterm will be done in class		
Weeks 9 & 10 (no class 10/25)	10/27, 11/1, 11/03, 11/8,	Estimation	HW5: Ch6	6.1 - 6.10
Weeks 11 & 12	11/10, 11/15, 11/17	Hypothesis Testing: One Sample Inference	HW6: Ch7	7.1 -7.5, 7.8-7.9, 7.11,7.12
Week 13	11/22, 11/24	Hypothesis Testing: Two-Sample Inference	HW7: Ch8	8.1 – 8.8, 8.11
Week 14	11/29, 12/1	Power and sample size	HW8: Ch7,8,9	7.6-7.7, 8.9, 8.11
Weeks 15	12/6(Quiz 2), 12/8	Nonparametric Methods	HW: Ch7,8,9	9.1 – 9.5
Week 15		Final Exam Review (Chapters 6 to 8)		

<u>*Dates of Quizzes and Exams:*</u>

9/27 (Monday): Quiz 1 (Descriptive Statistics and Probability, Chapters 2 and 3).

10/18 (Monday): Midterm

12/6 (Monday): Quiz 2, Estimation and Hypothesis Testing: One and Two sample inference (Chapters 7 and 8), and Hypothesis testing (Chapters 6).

Final Exam: TBD