Johns Hopkins University

Course Information

Biostatistics

NR.110. 202 (3.0 Credits)

<u>Description</u>

This course provides an introduction to the basic concepts of statistical ideas and methods that aims to equip students to carry out common statistical procedures and to follow statistical reasoning in their fields of study. Principles of measurement, data summarization, and univariate and bivariate statistics are examined. Emphasis is placed on the application of fundamental concepts to real world situations.For textbook information:http://nursing.jhu.edu/academics/programs/prerequisites/prerequisite-textbooks

Department: NR PP
College: School of Nursing

Course Learning Objectives

Course Learning Outcomes (CLOs):

CLO1 Summarize and interpret data visually through appropriate statistical graphs.

CLO2 Describe density curves and the properties of the normal distributions.

CLO3 Examine correlations and linear relationships of explanatory and response variables.

CLO4 Describe sampling distributions and the central limit theorem.

CLO5 Discuss statistical inference using confidence intervals and tests of significance.

CLO6 Explain the differences among various statistical techniques and identify an appropriate technique for a given set of variables and research questions.

Required Text and Other Materials

Required Textbooks and Course Materials:

Baldi, B. & Moore, D. (2018). The Practice of Statistics in the Life Sciences. (4th ed.). New York, NY: W.H. Freeman and Company.

Recommended Course Materials:

Sapling: Students must purchase access to Macmillan's Sapling platform in order to access quiz content and supplemental course materials. More details on how to purchase can be found in the Syllabus & Course Info area of the classroom

Summary of Learning Assessments/Assignments

Assessment Summary:

LEARNING ASSESSMENT/ ASSIGNMENT	COURSE OBJECTIVES ADDRESSED	WEIGHT TOWARD FINAL COURSE GRADE	DUE DATE
Module Quizzes, 10 quizzes in total (20pts each)	1, 2, 3, 4, 5, 6	40%	Dates vary See Course Schedule
Weekly Discussions, 3 Discussion Boards in total (10pts each)	1, 2, 3, 4, 5, 6	30%	Dates vary See Course Schedule
Exam 1	1, 2, 3, 4, 5, 6	15%	Module 5
Exam 2	1, 2, 3, 4, 5, 6	15%	Module 10

Learning Assessments/Assignments

Learning Assessments/Assignments:

Lectures and Readings

Most modules will include recommended reading from the required text and associated lectures. It is recommended that students read the material and listen to the lectures as to best facilitate their successful completion of course assignments.

CanvasPosts

Students are required to draft **three** discussion board topics **between 300-500 words each**. Students must also **reply to at least two classmates' posts** by the assigned deadline to receive full credit. Suggested length for responses is **1-2 paragraphs each**. High quality posts will contribute substantive content, illustrate a strong understanding of course material, use appropriate style, and demonstrate thoughtful linguistic choice. Please cite sources using APA guidelines and include links as appropriate.

Quizzes

Regular quizzes will test student understanding of course content. Quizzes can be attempted one time and students are encouraged to consult course materials as needed to complete the quiz. These quizzes are not timed tests, but please understand that if you walk away from your quiz while taking it, depending on your computer and the length of time, you may be automatically logged out of Canvas.

Exams

Comprehensive exams consisting of multiple choice questions will be given to assess student understanding of course content. They are open book, open notes and timed. Only one attempt is allowed for each exam. There are no makeup exams.

Evaluation and Grading

Grading Scale:

RANGE	LETTER GRADE	GRADE POINT
97-100	A+	4.0
93-96	A	4.0
90-92	A-	3.7
87-89	B+	3.3
83-86	B	3.0
80-82	B-	2.7
77-79	C+	2.3

73-76	C	2.0
70-72	C-	1.7
67-69	D+	1.3
63-66	D	1.0
60-62	D-	0.7
<60	F	0

Course Schedule

Course Schedule:

Module	Module Subtopics	Learning Activities, Formative Assessment & Resources	Evaluative Assessment
Welcome Start Here	· Getting Started	Familiarize yourself with Canvas	Discussion Board: Introduce Yourself Avoiding Plagiarism Module

Module	Module Subtopics	Learning Activities, Formative Assessment & Resources	Evaluative Assessment
Module 1: Introduction to Statistics Picturing Data with Graphs	· Individuals and variables · Pie charts and bar graphs · Histograms and stemplots	Baldi, B. & Moore, D. (2018). The Practice of Statistics in the Life Sciences. (4th ed.). · Chapter 1: Picturing Distributions with Graphs Review the lecture materials posted in the module for this week.in the module for this week.	Module 1 Quiz Module 1 Discussion Board
Module 2: Describing Distributions with Numbers	· Mean and median · Standard deviation	Baldi, B. & Moore, D. (2018). The Practice of Statistics in the Life Sciences. (4th ed.). · Chapter 2, "Describing Quantitative Distributions with Numbers" Review the lecture materials posted in the module for this week.	Module 2 Quiz

Module	Module Subtopics	Learning Activities, Formative Assessment & Resources	Evaluative Assessment
Module 3: The Normal Distribution	· Density curves · Z-scores	Baldi, B. & Moore, D. (2018). The Practice of Statistics in the Life Sciences. (4th ed.). · Chapter 11, "The Normal Distributions" Review the lecture materials posted in the module for this week.	Module 3 Quiz Module 3 Discussion Board
Module 4: Correlation and Simple Linear Regression	· Explanatory and response variables · Scatterplots and correlation · Regression lines	Baldi, B. & Moore, D. (2018). The Practice of Statistics in the Life Sciences. (4th ed.). · Chapter 3, "Scatterplots and Correlation" · Chapter 4, "Regression" Review the lecture materials posted in the module for this week.	Module 4 Quiz

Module	Module Subtopics	Learning Activities, Formative Assessment & Resources	Evaluative Assessment
Module 5: Sampling Distributions	· Parameters and statistics · The law of large numbers · Sample means · Central limit theorem	Baldi, B. & Moore, D. (2018). The Practice of Statistics in the Life Sciences. (4th ed.). · Chapter 13, "Sampling Distributions" Review the lecture materials posted in the module for this week.	Module 5 Quiz
Exam 1	None	Review content in Module 1 through Module 5	
Module 6: Confidence Intervals	· Statistical interference and estimation	Baldi, B. & Moore, D. (2018). The Practice of Statistics in the Life Sciences. (4th ed.). · Chapter 14, "Introduction to Inference" pg. 347 - 356 · Chapter 15, "Inference in Practice" pg. 375 â€" 388 Review the lecture materials posted in the module for this week.	Module 6 Quiz

Module	Module Subtopics	Learning Activities, Formative Assessment & Resources	Evaluative Assessment
Module 7: Tests of Significance	· P-value and statistical significance	Baldi, B. & Moore, D. (2018). The Practice of Statistics in the Life Sciences. (4th ed.). · Chapter 14, "Introduction to Inference" pg. 358 367 Review the lecture materials posted in the module for this week.	Module 7 Quiz
Module 8: Tests	· Two sample problems	Baldi, B. & Moore, D. (2018). The Practice of Statistics in the Life Sciences. (4th ed.). · Chapter 17, "Inference about Population Mean" · Chapter 18, "Comparing Two Means" Review the lecture materials posted in the module for this week.	Module 8 Quiz Module 8 Discussion Board

Module	Module Subtopics	Learning Activities, Formative Assessment & Resources	Evaluative Assessment
Module 9: ANOVA	· F distributions	Baldi, B. & Moore, D. (2018). The Practice of Statistics in the Life Sciences. (4th ed.). · Chapter 24, "One-Way Analysis of Variance" Review the lecture materials posted in the module for this week.	Module 9 Quiz
Module 10: The Chi-square Test	· Two-way tables	Baldi, B. & Moore, D. (2018). The Practice of Statistics in the Life Sciences. (4th ed.). · Chapter 21, "The Chi-Squared Test for Goodness of Fit" · Chapter 22, "The Chi-Squared Test for Two-Way Tables" Review the lecture materials posted in the module for this week.	Module 10 Quiz
Exam 2	None	Review content in Module 6 through Module 10	