O'Neill School of Public and Environmental Affairs

SPEA K300 – Fall 2020
Statistical Techniques Course Syllabus

TR 1:10-2:25pm, online
Instructor: Michelle LEE
Instructor Email: Canvas email
Instructor Zoom OH: by appointment
ZoITS: M-R 5:45- 8:15pm

Class Number: 3659
GTA #1: Edward Young
GTA #2: Arya Harison
UTA #1: Oliver YONG
TA Zoom OH: -see below-
TA Emails: Canvas email

Course Description and Objectives

This course provides an introduction to basic statistical analysis and interpretation. Topics covered in this course include (but are not limited to) the following: the nature of statistical data, ordering and manipulation of data, measures of central tendency, probability, statistical inferences, hypothesis testing, estimation and correlation and regression. The focus of this course is on the practical application and interpretation of statistics for intelligent functioning in a professional or academic environment. As such, the course simulates the real environment as much as possible, comprised of peers and resources to aid in statistical application and interpretation. While it is necessary to demonstrate individual mastery of the key concepts taught in this course, it is equally imperative to develop skills and techniques to apply statistical knowledge in a practical setting.

Learning Outcomes

By the end of the semester, students should have gained a better appreciation of how statistics is and can be applied in everyday life, and should be able to utilize proper statistical techniques when required.

Required Texts/ Materials

1. Triola, Mario F. Elementary Statistics. 12th ed. Boston: Pearson/Addison-Wesley, 2018. (Integrated into Canvas)
2. Microsoft Excel
3. MyStatLab Platform (Integrated into Canvas)
4. StatCrunch (Integrated into Canvas)
5. Calculator

Note: **Prerequisite** for this class is M014 or equivalent. Students should have an understanding of basic high school algebra, and should be able to navigate Microsoft Excel and Microsoft Word applications.

Canvas

Canvas will be used throughout the course and should be checked on a regular basis for announcements and to access all assignments. If you are unable to access Canvas for any reason, please notify me immediately. IU recommends students to use the Boost tool, a mobile app integrated with Canvas that reminds students about due dates, aggregates announcements from their various classes, and provides encouragement along the way.

Course Requirements

1. This class meets Tuesdays & Thursdays on Zoom according to the syllabus. You MUST sign in via your IU Zoom account, and enter the meeting password. All participants will be muted, and I will unmute to cold-call on students:

<u>Lectures</u>
Join from computer or mobile:
https://iu.zoom.us/j/94300849656?pwd=eFR0ZmxHU2Q2UTllcTJ1NlFSdDV1QT09

Meeting ID: 943 0084 9656
Password: 314159

One tap mobile
+13017158592,,94300849656# US (Germantown)
+13126266799,,94300849656# US (Chicago)

<u>GTA #1 Office Hour (Edward Young): MW 5:45-8:15pm</u>
Join from computer or mobile:
https://iu.zoom.us/j/4339443306?pwd=TnZRbm5ESjNqRlZjNy85MDRkS25VQT09

Meeting ID: 433 944 3306
Password: EDDIEZOOM

<u>GTA #2 Office Hour (Arya Harison): TTh 2:30-5pm</u>
Join from computer or mobile:
https://iu.zoom.us/j/96321244499?pwd=UitzL1pxTkNsTkFQdHA2K1ZVVXRrZz09

Meeting ID: 963 2124 4499
Password: 044658

<u>UTA (Oliver Yong) Office Hour: F 10-12pm</u>
Join from computer or mobile:
https://iu.zoom.us/j/5754196678

No Meeting ID
No Password

2. This section utilizes the "flipped classroom" format. Hence, students are expected to utilize all online resources including lecture slides before attending online lectures. This is to make full use of online lecture time to ask questions and work on selected problems synchronously.
3. All online lectures held will be recorded and posted on Zoom 2 hours after the lecture has ended.
4. All assignment items and components of the Group Research Project must be turned in online.
5. Late assignment items and components of the Group Research Project will be penalized one letter grade per day (10%) unless given prior approval by the instructor for extenuating circumstances. **Submissions more than two days late are not accepted.**
6. Make up exams will be given **only** for proven and substantiated extenuating circumstances. These do not include purchased flight tickets, etc. Make up exams will be different, and generally more difficult than the exams given at the scheduled time. All exams will be held during the stipulated class time. Additional buffer time will be provided to accommodate problems with internet connectivity and any time zone differences. It is your responsibility to be aware of any time differences and ensure that you have no conflicts with the exam times.
7. O'Neill has requested all instructors to include this new information:

Note Selling: Several commercial services have approached students regarding selling class notes/study guides to their classmates. Selling the instructor's notes/study guides in this course is not permitted.

Violations of this policy will be reported to the Dean of Students as academic misconduct (violation of course rules). Sanctions for academic misconduct may include a failing grade on the assignment for which the notes/study guides are being sold, a reduction in your final course grade, or a failing grade in the course, among other possibilities. Additionally, you should know that selling a faculty member's notes/study guides individually or on behalf of one of these services using IU email, or via Canvas may also constitute a violation of IU information technology and IU intellectual property policies; additional consequences may result.

Online Course Materials: The faculty member teaching this course holds the exclusive right to distribute, modify, post, and reproduce course materials, including all written materials, study guides, lectures, assignments, exercises, and exams. While you are permitted to take notes on the online materials and lectures posted for this course for your personal use, **you are not permitted to re-post in another forum, distribute, or reproduce content from this course without the express written permission of the faculty member.** Any violation of this course rule will be reported to the appropriate university offices and officials, including to the Dean of Students as academic misconduct.

Assignments / Grading

Course grades will be assigned based upon the following distribution:

Item	Points	Final Grade %	Due Date
Assignments			
Homework (10 @ 20 points each)	200	20	Weekly
Quizzes (10 @ 15 points each)	150	15	Weekly
Attendance & In-class exercises	160	16	After each lecture
Filling out Course Survey	20	2	Aug 31
1 Longer Writing Assignment: Journal Article Analysis	100	10	Nov 30
Exams			
Exam 1	130	13	Sept 8
Exam 2	130	13	Sept 22
Exam 3	130	13	Oct 29
Exam 4	130	13	Dec 3
Drop 1 Exam score			
Bonus Points			
Complete all 4 exams	20	2	
MAX TOTAL SCORE	**1040**	**104**	

Grading Scale (Rounded to one decimal place)

97 -104 = A+	95 - 96.9 = A	90 - 94.9 = A-	87 - 89.9 = B+
83 - 86.9 = B	80 - 82.9 = B-	77 - 79.9 = C+	73 - 76.9 = C
70 - 72.9 = C-	67 - 69.9 = D+	63 - 66.9 = D	60 - 62.9 = D-

Attendance & In-class exercises

Because of the importance of in-class discussions in aiding your understanding of the course material, 140 points (14%) of your final grade is based on your attendance in in-class assignments. These assignments should be submitted on Canvas, and are due before midnight of that lecture day. Submissions will be evaluated using the check/check plus/check minus system. This means no submissions/low quality submissions receives 0 credit, partially correct quantitative answers or show decent effort on writing assignments get 70% credit,

and excellent submissions with close to/fully correct quantitative answers and/or show good effort on writing assignments get full credit.

Homework
Throughout the course, you will complete 11 Pearson on-line homework assignments, each covering one chapter of the material. You will be given complete assignments at least two weeks in advance of their due date. You are encouraged to discuss the assignments with your peers, however, **the finished product turned in MUST BE YOUR OWN WORK**. Understanding the homework assignments is critical to performing well on the exams.

The online homework assignments will comprise 20 points for each of the 10 chapter homework assignments, for 22% of your final grade. There are about 20-25 questions per homework assignment, and some questions may comprise of multiple parts. You have three chances at each question. You may print these questions out to practice for the exam. Due dates for the homework assignments are posted on the syllabus and on the Pearson online homework tool.

Quizzes
You will complete 10 timed Pearson online chapter quizzes for a total of 15% of your final course grade. The quizzes will be assigned after the chapter homework assignments have been submitted. There are about 5 questions per quiz, and some questions may comprise of multiple parts. You have two chances at each question. Due dates for the quizzes correspond with the chapter homework assignments.

Exams
Four exams will be offered via Pearson online. Each exam will cover predominantly the material covered in the prior class sessions, as listed in the syllabus; however, some cumulative knowledge is necessary to interpret and apply the statistical tools. Each exam will be open for 6 hours, from 12-6pm the day of the exam to access the exam, but you will only have the full class period (1h 15 minutes) to complete your exam. All students, barring international students or students in a different time zone, are expected to take the exam during regular class time. Your TAs & I will not be able to respond to Canvas requests for help outside of this time period. **The exams will increase in difficulty from exam #1— #4.**

Exams will include problems similar to those completed in homework assignments, in-class activities and during exam reviews; a critical understanding of these assignments is necessary for performing well on the exams. You will not be required to memorize formulas for the exams; however, you will need to know when to apply a particular formula to a given problem. You are allowed to use StatCrunch for the exam.

Scoring Exams & Bonus Points
Each of the 4 exams offered account for 130 points. Scores from the 3 highest-scoring exams will be used to calculate your final grade. If you choose not to sit for an exam, you will receive a 0 grade for that exam. This is done to provide students with more learning flexibility this semester. Students will receive bonus points to reward them for going the extra mile in this section. If all 4 exams are completed, 20 points are awarded.

Pearson Study Plan
The Study Plan, which is available for this course is an adaptive learning tool that helps students to practice (or work on problems) on their own. It monitors students' performances on homework, and quizzes and continuously provides recommendations based on their performance. When you have practiced the material for a specific section or objective, you can take a 'Quiz Me' quiz to determine if you have mastered the material. The Study Plan can be accessed on the Pearson platform on Canvas. The Study Plan will **NOT** count toward your final grade since it is for your practice and self-remediation. Regardless, I strongly suggest you use this resource throughout the semester to assist you master the course content.

Policy on Incompletes
There will be no incomplete grades except under extraordinary circumstances with the appropriate documentation, in accordance with the IU Academic Handbook.

Academic Dishonesty

Academic misconduct will be treated according to current IU regulations in the Code of Student Rights, Responsibilities and Conduct (See O'Neill Student Honor Code https://students.oneill.indiana.edu/doc/ugrad-doc/ugrd-student-honor-code.pdf). Each student should understand his or her rights and responsibilities under the Code.

For example, under the Code of Student Rights, Responsibilities and Conduct, a student must give credit to the work of another person when he/she does any of the following:

    a. Quotes another person's actual words, either oral or written;
    b. Paraphrases another person's words, either oral or written;
    c. Uses another person's idea, opinion, or theory; or
    d. Borrows facts, statistics, or other illustrative material, unless the information is common knowledge.

This also entails that you MAY NOT copy any course item from another student, either in whole or in part.

Tips for doing well in my section:

1) Read the textbook and uploaded slides before lecture.
2) Come to lectures prepared and ask questions.
3) Attend Zo-ITs, or office hours.
4) Study with group members/friends.
5) Maintain a curious and positive attitude towards this course.
6) Do not panic! Give yourself time to understand the material.

    And most importantly…

7) Maintain a positive attitude towards the course— do not complain.

Additional Information for Students

Counseling and Psychological Services

For information about services offered to students by CAPS:
http://healthcenter.indiana.edu/counseling/index.shtml

Religious Observation

In accordance with the Office of the Dean of Faculties, any student who wishes to receive an excused absence from class must submit a request form available from the Dean of Faculties for each day to be absent. This form must be presented to the course instructor by the end of the second week of this semester. A separate form must be submitted for each day. The instructor will fill in the bottom section of the form and then return the original to the student. Information about the policy on religious observation can be found at the following website: https://policies.iu.edu/policies/aca-59-accommodation-religious-observances/index.html.

Disability Services for Students

Securing accommodations for a student with disabilities is a responsibility shared by the student, the instructor and the DSS Office. For information about support services or accommodations available to students with disabilities, and for the procedures to be followed by students and instructors: https://studentaffairs.indiana.edu/student-support/disability-services/index.html.

Sexual Harassment

As your instructor, one of my responsibilities is to help create a safe learning environment on our campus. Title IX and our own Sexual Misconduct policy prohibit sexual misconduct. If you have experienced sexual misconduct, or know someone who has, the University can help.

    If you are seeking help and would like to talk to someone confidentially, you can make an appointment with:
        i. The Sexual Assault Crisis Service (SACS) at 812-855-8900

  ii. Counseling and Psychological Services (CAPS) at 812-855-5711

  iii. Confidential Victim Advocates (CVA) at 812-856-2469

  iv. IU Health Center at 812-855-4011

For more information about available resources: http://stopsexualviolence.iu.edu/help/index.html. It is also important to know that federal regulations and University policy require me to promptly convey any information about potential sexual misconduct known to me to our campus' Deputy Title IX Coordinator or IU's Title IX Coordinator. In that event, they will work with a small number of others on campus to ensure that appropriate measures are taken and resources are made available to the student who may have been harmed. Protecting a student's privacy is of utmost concern, and all involved will only share information with those that need to know to ensure the University can respond and assist. I encourage you to visit http://stopsexualviolence.iu.edu/help/index.html to learn more.

Commitment to Diversity: Find your home and community at IU
Asian Culture Center
Address: 807 East Tenth Street, Bloomington, IN 47408
Phone: 812-856-5361
Email: acc@indiana.edu
Website: https://asianresource.indiana.edu/index.html

First Nations Educational & Cultural Center
Address: 712 E 8th St., Bloomington, IN 47408
Phone: 812-855-4814
Email: fnecc@indiana.edu
Website: https://firstnations.indiana.edu/contact/index.html

LGBTQ+ Culture Center
Address: 705 E 7th St., Bloomington, Indiana 47408
Phone: 812-855-4252
Email: glbtserv@indiana.edu
Website: https://lgbtq.indiana.edu/contact/index.html

La Casa Latino Culture Center
Address: 715 E 7th St., Bloomington IN, 47408
Phone: 812-855-0174
Email: lacasa@indiana.edu
Website: https://lacasa.indiana.edu/

Neal Marshall Black Culture Center
Address: 275 N Jordan Ave Bloomington, Indiana 47405
Phone: 812-855-9271
Email: nmgrad@indiana.edu
Website: https://blackculture.indiana.edu/index.html

This syllabus is subject to change and may be amended throughout the course to reflect any changes deemed necessary by the instructor.

Date	Topics and Readings	Assignments
Aug 25	Introduction to Statistics • 1-1 Review and Preview • 1-2 Statistical and Critical Thinking • 1-3 Types of Data	Review syllabus, assignments, course expectations, and group research project. Course survey due Aug 31 HW & Quiz #1 due Aug 31
Aug 27	Introductions to Statistics ❖ 1-4 Collecting Sample Data	
Sept 1	Summarizing and Graphing ❖ 2-1 Review and Preview ❖ 2-2 Frequency Distributions ❖ 2-3 Histograms ❖ 2-4 Graphs that Enlighten & Graphs That Deceive	HW & Quiz #2 due Sept 7
Sept 3	*Exam #1 Review: Chapters 1 – 2*	
Sept 8	*Exam #1: Chapters 1 – 2*	
Sept 10	Statistics for Describing, Exploring, and Comparing Data ❖ 3-1 Review and Preview ❖ 3-2 Measure of Center ❖ 3.3 Measure of Variation	HW & Quiz #3 due Sept 16 Sept 11: last day to submit course survey without penalty
Sept 15	Statistics for Describing, Exploring, and Comparing Data ❖ 3-3 Measure of Variation (cont'd) ❖ 3-4 Measure of Relative Standing and Boxplots	
Sept 17	Probability ❖ 4-1 Review and Preview ❖ 4-2 Basic Concepts and Probability ❖ 4-3 Additional Rule ❖ 4-4 Multiplication Rule: Basics	HW & Quiz #4 due Sept 23
Sept 22	*Exam #2 Review: Chapters 1 – 4*	
Sept 24	*Exam #2: Chapters 1 – 4*	
Sept 29	Discrete Probability Distributions ❖ 5-1 Preview and Review ❖ 5-2 Probability Distributions	HW & Quiz #5 due Oct 5
Oct 1	Discrete Probability Distributions ❖ 5-3 Binomial Probability Distributions ❖ 5-4 Parameters for Binomial Distributions	
Oct 6	Normal Probability Distributions ❖ 6-1 Review and Preview ❖ 6-2 The Standard Normal Distribution ❖ 6-3 Applications of Normal Distribution	HW & Quiz #6 due Oct 14
Oct 8	Normal Probability Distributions ❖ 6-3 Applications of Normal Distribution (con't) ❖ 6-4 Sampling Distributions and Estimators	
Oct 13	Normal Probability Distributions ❖ 6-5 The Central Limit Theorem ❖ 6-6 Assessing Normality ❖ 6-7 Normal as Approximation to Binomial	
Oct 15	Estimates and Sample Sizes	

	❖ 7-1 Review and Preview ❖ 7-2 Estimating a Population Proportion ❖ 7-3 Estimating a Population Mean	HW & Quiz #7 due Oct 21
Oct 20	Estimates and Sample Sizes ❖ 7-4 Estimating a Population Standard Deviation or Variance	
Oct 22	*Exam #3 Review: Chapters 5 – 7*	
Oct 27	*In-class assignment: study reflection*	
Oct 29	*Exam #3: Chapters 5 – 7*	
Nov 3	Hypothesis Testing ❖ 8-1 Review and Preview ❖ 8-2 Basics of Hypothesis Testing ❖ 8-3 Testing a Claim About a Proportion	HW & Quiz #8 due Nov 9
Nov 5	Hypothesis Testing ❖ 8-4 Testing a Claim About a proportion (con't).	
Nov 10	Inferences from Two Samples ❖ 9-1 Review and Preview ❖ 9-2 Two Proportions ❖ 9-3 Two Means: Independent Samples	HW & Quiz #9 due Nov 16
Nov 12	Inferences from Two Samples ❖ 9-3 Two Means: Independent Samples ❖ 9-4 Two Dependent Samples (Matched Pairs)	
Nov 17	Correlation and Regression ❖ 10-1 Preview and Review ❖ 10-2 Correlation	HW & Quiz #10 due Nov 30
Nov 19	Correlation and Regression ❖ 10-1 Review and Preview ❖ 10.3 Regression	
~~ Thanksgiving Break! See you after the break! Don't forget everything I've taught you! ~~		
Dec 1	❖ "Public opinion towards hydraulic fracturing: The effect of beyond compliance and voluntary third-party certification"	Read Lee et al. paper in advance of lecture (in Canvas files). Longer Writing Assignment: Journal Article Analysis, due Dec 3
Dec 3	*Exam #4 Review: Chapters 8 – 10 & 12*	
Dec 8	*In-class assignment: study reflection*	
Dec 10	*Exam #4: Chapter 8 – 10 & 12*	

Fun, ungraded syllabus quiz/Lecture 1 in-class assignment:

1) I'm residing in Singapore, where the time difference is a cool 12h. Must I attend all Zoom lectures?

2) During Zoom lectures or office hours, should I have my webcam on or off?

3) I have a question about the class. How do I reach the instructor or the TAs?

   a. Who should I contact if I have a valid medical issue and require an extension on my homework or quiz?

   b. Who should I contact if I have concerns about my performance in this course in general?

4) What material will be covered in each quiz, and how much is each quiz worth?

5) How many homeworks & quizzes are there, and how do I access them?

6) What about the textbook?

7) My car broke down, and my bird stopped singing.. can I submit my homework or quiz after the due date and time?

8) How many exams are there in this class, how do I access them, and when can I take them?

   a. I don't feel like sitting for an exam, or oops! I missed an exam! What can I do?

9) It's close to the end of the semester and my grade sucks! What can I do to earn bonus points?

10) I've taken some really good notes and seriously, I deserve to monetize this! Can I?

11) Am I allowed to share test exams or lecture slides with my friends or juniors?

12) What are some tips to help me succeed in this class?

13) What is my instructor's name and what class is this??