Economics and Political Science Department

ECON 1090 [C01]: Statistical Analysis for Decision Making
Fall, 2024

Course Information

Credits Hours:	4
Course Delivery Format:	Fully Online Asynchronous. *Optional: Students may attend the recordings of lectures if they believe it would benefit them to ask questions live. Recording time: 3:00-4:30 pm T/Th. Google Meet link.*
Catalog Description:	This course covers the basic theory and practice of using statistics to guide decision making. Topics include descriptive statistics, probability, sampling, hypothesis testing, and regression. Focus is on real world public policy and business examples. The course also develops students' Excel skills to prepare them to conduct statistical analysis in government, advocacy, business, and industry settings. This course fulfills the liberal arts core mathematics/statistics requirement and is appropriate for students majoring in business, economics, political science, sociology, or any major that requires statistics. Offered in the College for Women and the College for Adults. Credit is given for only one of the following courses: ECON 1080, ECON 1090, HLTH 1090, PSYC 1090, STAT 1089, or STAT 1090.
Requisites:	N/A
Prerequisite(s):	N/A
Prerequisite(s) with concurrency:	N/A
Corequisite(s):	N/A

Faculty Information

Instructor:	Libby Kula
Pronouns:	she/her
Email:	erkula@stkate.edu
Office Location:	CdC 492
Availability/Office Hours:	Office hours: MW 10-11:30am in CdC 492 or on Google Meet Available by email to answer questions or set up a Zoom call if you need; will rarely respond on weekends.
Faculty Response Time:	48 hours or less during the school week.
Teaching Assistant:	Zoe McKillip
Pronouns:	They/them
Email:	zjmckillip841@stkate.edu Drop-in hours: MW 10:45 am-12:00 pm in the Econ Lab in CdC 487

Textbook(s) and Other Required Materials

Textbook:	Douglas S. Shafer and Zhiyi Zhang, 2021, *Introductory Statistics: A First Course*, FlatWorld, 978-1-4533-8895-2
Link:	https://students.flatworldknowledge.com/course/2609292

Technology Requirements and Tools

St. Kate's minimum computer requirements for students.

- Microsoft Excel, Google Sheets, or an equivalent technology
- Learning management system: Canvas
- Social reading/reacting tool: Perusall

Technology help is available through the Help Desk (located in the Tech Hub in the Library) at 651-690-6402 or by submitting a help ticket.

Course Goals

A liberal education at St. Kate's enables students to hone transferable skills, develop and refine competencies in analysis and communication, and empowers graduates to lead and influence. An education at St. Kate's emphasizes three institutional learning goals: (1) Intellectual Inquiry, (2) Creative & Critical Thinking, and (3) Social Responsibility.

The work in this course will further your learning in goal #2. You will learn to think critically about the ways you see data and statistics presented in the world and to draw thoughtful conclusions on your own.

Student Learning Outcomes

Student Learning Outcomes: The Economics & Political Science department at St. Catherine University is committed to the following learning outcomes:

1. *Use Quantitative & Logical Reasoning:* Express evidence in support of an argument and draw appropriate conclusions based on the analysis of data, while recognizing the limits of this analysis.
2. *Apply Disciplinary Theory & Knowledge:* Apply models from economics, political science, and other social science fields to address practical problems of individuals, firms, governments and communities.
3. *Collaborate & Communicate for Social Justice and Ethical Leadership:* Demonstrate the ability to collaborate with a wide range of community organizations, diverse colleagues, and multiple stakeholder groups and effectively communicate to disciplinary and non-disciplinary audiences.

In this course we will primarily focus on SLO #1. *Use Quantitative & Logical Reasoning*.

The table below identifies the learning outcomes students should achieve upon successful completion of this course. Instructional strategies and methods of assessment aligned with each learning outcome are also included.

Outcome Number	Student Learning Outcomes	Instructional Strategy	Method of Assessment
1	Use Quantitative & Logical Reasoning: Express evidence in support of an argument and draw	Lecture & hands-on learning.	Homework assignments and one final report.

	appropriate conclusions based on the analysis of data, while recognizing the limits of this analysis (ILO#2 Critical & Creative Thinking).		

Grading

Percent of the final grade attributed to each assignment:

HW 1: 15%
HW 2: 15%
HW 3: 15%
HW 4: 15%
Presentation: 20%
Final Report: 20%

Grading Policies

Revising & Resubmitting Assignments

If you are unhappy with your first grade on an assignment, you will be able to revise it, following my feedback, for one additional grade which can gain you at most half of the points lost on the first round. For example, if you get 60% on an assignment and revise & resubmit, you could get up to an 80%. You must revise & resubmit within two weeks of the date I have returned it to you. Everything must be turned in by 5pm on Sunday December 15th to earn any credit.

Late Assignments

If you are having challenges that may prevent you from doing work you are proud of on time, please reach out as soon as you can. I am willing to grant extensions if life events arise. Please communicate in advance as much as possible, or as soon as you can. I understand that may not be right away if a crisis arises.

Late work without communication or a crisis will be accepted for partial credit. Everything must be turned in by 5pm on Sunday December 15th to earn any credit.

AI Policy

This course will allow Selective Use of generative artificial intelligence (AI). **On each assignment, I will instruct you as to if and how you are allowed to use AI tools.** I believe AI can be a useful tool; however, you should never use it as a substitute for learning or creating. I want to know your understanding of the material to help you grow as a student!

I encourage you to read through the Library's guide on responsible use of AI for students. It outlines important considerations, including the following:

- How AI output should never be taken at face value given AI's tendency to "hallucinate." You must always verify the information for yourself.
- How AI reflects and can perpetuate biases and inequities.
- How much energy and water resources AI requires, which can negatively impact the environment.

I highly recommend following the guide's advice for navigating these challenges.

Learning Resources

Tutors

The Economics & Political Science Department hires student tutors who will be able to help you with this course. Find their schedules here: https://docs.google.com/document/d/1Qt_XUb0KCI5C2nV9-SznRQmah7QnkQqY2nH6eFvkbKw/edit

Learning Management System (LMS)

The course site in Canvas houses course announcements and resources such as course documents, websites, and course content.

Student Success Support Resources

Student Success is a web-based software platform that offers students access to various support services that help them engage, connect, and succeed at St. Kate's. Visit the Student Success platform to view and schedule an appointment for support services such as Academic Advising, Accessibility and Accommodations, Tutoring, and more.

The Economics & Political Science Department hires student tutors who will be able to help you with this course. I will announce their schedules via Canvas when I have access to them.

Maintaining an Inclusive and Accessible Class

Your success in this class is important to me. I am committed to inclusive, universal learning that values the differences that students bring to the class. This means that our classroom, virtual spaces, practices, and interactions must be as civil and inclusive as possible. Mutual respect, civility, and the ability to listen and observe others thoughtfully are crucial to learning together.

This course is intended for all students, including those with mental or physical disabilities, illness, injuries, impairments, or any other condition that tends to negatively affect one's equal access to education. If, at any point in the term, you find yourself not able to fully access the space, content, and experience of this course, you are welcome (but not required) to contact me. It is never too late to request accommodations -- our bodies and circumstances are continuously changing. I also

encourage you to contact Accessibility Resources. By making a plan through this office, you can ensure accommodation without disclosing your condition to course instructors.

I also want you to know that I respect your observance of religious holidays and will work with you on a plan to make up any missed course work, according to the Religious Holiday Accommodation Policy.

If there are aspects of this course that prevent you from learning or exclude you, please let me know as soon as possible. Together we'll develop strategies to meet your needs and the course requirements, working in conjunction with other campus offices to create a more accessible and inclusive learning environment, as appropriate.

University Policies

University policies are available through the Registrar's Academic Catalog and University Policies webpage. The University's Inclusive Excellence and Inclusive Excellence Resources for Students provide full statements and resources.

St. Catherine University is committed to equal access for all and recognizes that disability is an aspect of diversity. The University's goal is to create learning environments that are usable, equitable, inclusive and welcoming. If there are aspects of the instruction or design of this course that result in barriers to the learning environment and/or the accurate assessment of your achievement, please contact Student Accessibility & Accommodations as soon as possible.

If you are registered with Student Accessibility & Accommodations and have been granted an accommodation, please contact me at erkula@stkate.edu to review how the accommodation will be applied in this course.

Student Accessibility & Accommodations Main Office
(651) 690-6563 | Accessibility@skate.edu

Course Schedule

Week	Recording Date (posted the following day)	Topic	Materials	Assignments
Week 1	Tues., Aug. 27	Welcome! Discuss syllabus & course goals, introduce Perusall	N/A	
	Thurs., Aug. 29	Introduction to Statistics (1.1-1.3)	Ch. 1	

Week 2	Tues., Sept. 3	Data visualizations (2.1) Measures of central location (2.2)	Ch. 2	
	Thurs., Sept. 5	Measures of variability (2.3) Summary Description of Data Sets (2.4)	Ch. 2	
Week 3	Tues., Sept. 10	Relative Position of Data (2.5) The Empirical Rule and Chebyshev's Theorem (2.6)	Ch. 2	
	Thurs., Sept. 12	Random Variables (4.1) Probability Distributions for Discrete Random Variables (4.2) The Binomial Distribution (4.3)	Ch. 4	
Week 4	Tues., Sept. 17	Continuous Random Variables (5.1) The Standard Normal Distribution (5.2)	Ch. 5	HW 1 due
	Thurs., Sept. 19	Probability Computations for General Normal Random Variables (5.3) Areas of Tails of Distributions (5.4)	Ch. 5	
Week 5	Tues., Sept. 24	The Mean and Standard Deviation of the Sample Mean (6.1) The Sampling Distribution of the Sample Mean (6.2)	Ch. 6	
	Thurs., Sept. 26	The Sample Proportion (6.3)	Ch. 6	
Week 6	Tues., Sept. 31	Large Sample Estimation of a Population Mean (7.1) Small Sample Estimation of a Population Mean (7.2)	Ch. 7	
	Thurs., Oct. 3	Large Sample Estimation of a Population Proportion (7.3) Sample Size Considerations (7.4)	Ch. 7	HW 2 due
Week 7	Tues., Oct. 8	The Elements of Hypothesis Testing (8.1) Large Sample Tests for a Population Mean (8.2)	Ch. 8	
	Thurs., Oct. 10	The Observed Significance of a Test (8.3) Small Sample Tests for a Population Mean (8.4) Large Sample Tests for a Population Proportion (8.5)	Ch. 8	
Week 8	Tues., Oct. 15	Comparison of Two Population Means: Large, Independent Samples (9.1) Comparison of Two Population Means: Small, Independent Samples (9.2)	Ch. 9	
	Thurs., Oct. 17	Comparison of Two Population Means: Paired Samples (9.3) Comparison of Two Population Proportions (9.4) Sample Size Considerations (9.5)	Ch. 9	HW 3 due Oct. 21 @10pm
Week 9	Tues., Oct. 22	Linear Relationships Between Variables (10.1) The Linear Correlation Coefficient (10.2)	Ch. 10	

	Thurs., Oct. 24	Modelling Linear Relationships with Randomness Present (10.3) The Least Squares Regression Line (10.4)	Ch. 10	
Week 10	Tues., Oct. 29	Statistical Inferences About β_1 (10.5) The Coefficient of Determination (10.6)	Ch. 10	
	Thurs., Oct. 31	Estimation and Prediction (10.7) A Complete Example (10.8)	Ch. 10	
Week 11	Tues., Nov. 5	Chi-Square Tests for Independence (11.1) Chi-Square One-Sample Goodness-of-Fit Tests (11.2)	Ch. 11	
	Thurs., Nov. 7	F-tests for Equality of Two Variances (11.3) F-Tests in One-Way ANOVA (11.4)	Ch. 11	
Week 12	Tues., Nov. 12	Work day for final report/presentations, I will be on the link as additional office hours if you have questions.	N/A	
	Thurs., Nov. 14	Presentations	N/A	HW 4 due
Week 13	Tues., Nov. 19	Presentations	N/A	
	Thurs., Nov. 21	Presentations	N/A	
Week 14	Tues., Nov. 26	Presentations	N/A	
Break	Thurs., Nov. 28	Break	N/A	
Week 15	Tues., Dec. 3	Presentations	N/A	
	Thurs., Dec. 5	Presentations	N/A	
Final Report due	Thurs, Dec. 12			Final Report due