



SYLLABUS

COLLEGE OF COMPUTING & SOFTWARE ENGINEERING

SCHOOL OF DATA SCIENCE & ANALYTICS

STAT 7100 – STATISTICAL METHODS

SUMMER 2025

Course Information

Class meeting time: Wednesdays and Fridays, 8:00 AM to 10:45 AM

Modality and Location: Hybrid *Synchronous*; *Twice a week (Wed - Atrium Building 251 (now 2031) and on [Teams](#), Fri - Fully on [Teams](#))*

The syllabus is posted in D2L

Instructor Information

Name: Aradhana Soni

Email: asoni4@kennesaw.edu

Office Location: Atrium Room 1217A

Office Hours: Wednesdays 11:00 AM to 1:00 PM or by appointment

Preferred method of communication: KSU email - asoni4@kennesaw.edu

Course Description

STAT 7100 - Statistical Methods

3 Class Hours 0 Laboratory Hours 3 Credit Hours

Prerequisite: Admission to the MSDSA program

Stat 7100 is designed to give students the foundation in statistical methods necessary for further study in the graduate program. The course begins with a study of probability and statistical distributions (e.g., binomial, Poisson, uniform, exponential, gamma, chi-square and normal). The course then moves into inferential topics on parameter estimation (point and interval) and hypothesis testing, and concludes with advanced methods including but not limited to categorical data analysis, simple linear regression analysis, and one-way analysis of variance.

Course Materials

Required Text

The required text for the course is:

Demidenko, E. (2019). *Advanced statistics with applications in R*. Wiley Series in Probability and Statistics.

Hoboken, NJ

Print ISBN:9781118387986 | Online ISBN:9781119449195 | DOI:10.1002/9781119449195

Recommended Texts

You may find the following open-sourced textbooks useful in supplementing your studies. They are optional and can be accessed using various options from the Open Textbook Library website.

Baxter, J. (2023). *Introduction to probability*. Open Textbook Library. Download at:

<https://open.umn.edu/opentextbooks/textbooks/introduction-to-probability-2023>

Introduction to statistics. (2003). Online Statistics Education: A Multimedia Course of Study. Project Leader:

David M. Lane, Rice University. Download at:

<https://open.umn.edu/opentextbooks/textbooks/introduction-to-statistics>

Poldrack, R. (2018). *Statistical thinking for the 21st century*. Open Textbook Library. Download at: <https://open.umn.edu/opentextbooks/textbooks/statistical-thinking-for-the-21st-century>

Required Statistical Software

RStudio IDE (the latest version)

The required software for the course is the latest version of *RStudio*. Follow the steps provided at [RStudio Desktop - Posit](#) to install R first and then RStudio. All software demonstrations and scripts use R. If you prefer, you may use either SAS or Python, but these will not be taught or issues arising from them resolved by the professor.

Operating systems have different requirements for running different versions of the software. Resolve any software or device issues you have with the appropriate technical support service provider or search trusted documentation and websites. There may also be some resources available to you at University Information and Technology Services (UITs, <https://uits.kennesaw.edu/>). Your professor does not provide technical services.

Minimum Technology Requirements

In order to complete this course, students must have access to the following technologies:

- A computing device – a desktop or laptop computer that is capable of:
 - accessing Internet-based content
 - displaying recorded video
 - playing recorded audio - with speakers or headphones
 - recording audio - with a microphone or headset
 - capturing your image and actions during exams with a web camera
 - Having standard office productivity applications such as MS Word, Excel & PowerPoint, and Adobe Reader.
- Internet access of sufficient speed to download/display recorded lectures.
- A printer (optional, for printing the course calendar, etc.)
- Students enrolled in this course are expected to have a highly functional level of technology literacy. You should be able to upload, download, and modify files, including office documents, spreadsheets, PDFs, and presentation technologies as presented in this module. You are expected to become familiar with the D2L Brightspace learning management system, especially posting and reading discussion forums and taking exams.
- Technology support for KSU systems, including D2L and free software download (MS Office 365) is available at: <https://uits.kennesaw.edu/support/newstudents.php> . Please do not email or post D2L problems to the course discussion or the professor.

Course Learning Outcomes

Upon successful completion of this course, the student will be able to:

1. Demonstrate understanding of the underlying mathematical principles of various probability distributions.
2. Apply knowledge of probability distributions.
3. Perform the appropriate statistical analysis for a given situation.
4. Use statistical software to execute complex procedures and to analyze data.
5. Communicate analysis results in a professional manner.

Course Requirements and Assignments

Weekly pre-lesson guides

The weekly pre-lesson worksheets are based on assigned readings and are completed to help you prepare for more advanced concepts that will be covered in the synchronous session. The worksheets are graded for completion.

Weekly pre-lesson quizzes

Short 2-5 question quizzes over the assigned reading material and to collect feedback. In addition to answering questions about content covered, you will provide statements for what concepts were clear to you, which were unclear, and one question you would like answered in class. The quizzes are administered in D2L and graded by the instructor for correctness.

Exams

Two exams are administered during synchronous sessions.

Project

You will form teams of 1-3 to complete a project on a major topic covered in the class, for which data is simulated. Each team will deliver a **live presentation (virtual or in-person) during the final week of the course**. A specific time slot will be assigned to each group for their presentation. Every team member is expected to present a significant portion of the project.

A designated team leader will be responsible for submitting bi-weekly status reports to the instructor. If any issues arise with participation, the team leader should notify the instructor immediately.

Synchronous Attendance

Synchronous sessions are an integral part of the course. The time will be used to demonstrate solutions to problems (including software demonstrations), present advanced topics, complete group work, or take exams. Attendance will be taken once during the session at an unspecified time. If your presence in the live session cannot be accounted for at that time, you will be marked absent. **Missing more than 3 synchronous sessions will result in a 10-point deduction on the final course points used to determine the final grade.**

Evaluation and Grading Policies

Evaluation

Weekly pre-lesson guides

13 total, lowest 3 grades dropped, no make-up or extra attempts, no grade replacement

Check for completion: 100% complete = 5 points, less than 100% but at least 50% complete = 2, more than 50% or altered by removing question = 0.

Total possible points towards grade: 10 @ 5 points each = 50 points

Weekly pre-lesson quizzes

13 total, lowest 3 grades dropped, no make-up or extra attempts, no grade replacement

Graded by the instructor

Total possible points towards grade: 10 @ 5 points each = 50 points

Exams

Two exams will be administered during synchronous sessions

Must be taken on the day and at the time scheduled, no exceptions. Missing an exam results in a grade of 0, no make-up or replacement grade allowed.

2 @ 100 points

Project

Group project (1 – 3 person teams). All group members get the same grade. Failure to participate or not completing assigned duties will result in a significantly reduced grade or a grade of 0 for an individual. Team reports will be submitted by the team leader.

1 @ 100 points

GRADING POLICY				
Grade	Percent		Points	
A	89.6%	100%	359	400
B	79.6%	89.5%	319	358
C	69.6%	79.5%	278	318
D	60%	69.5%	238	277
F	≤ 59%		≤ 238	

Midterm Grades: A midterm grade may be assigned by the midterm grade due date identified on the academic calendar. This midterm grade is for assessing mid-semester performance at least one week before the last day to withdraw without academic penalty. You may view your midterm grade in Owl Express. Note that only your final grade will be officially recorded on your academic transcript.

Course Policies

Attendance Policy

Attendance

Attendance will be taken once during the session at an unspecified time. If your presence in the live session cannot be accounted for at that time, you will be marked absent. **Missing more than 3 synchronous sessions will result in a 10-point deduction on the final course points used to determine the final grade.**

Expectations

I expect you to make your academic work, study/preparation, attendance/engagement, and timely submission of assignments for this class a top priority. You need to be sufficiently and functionally knowledgeable of the course syllabus and policies, and the course's D2L website, before the second class. You are responsible for reading all course materials so that you know the requirements for successfully completing the course and for how your final grade will be determined.

Missed Assignment and Make-Up Work Policy

You are expected to complete an assignment on or before the due date, regardless of personal circumstances. Missed pre-lesson guidelines or quizzes cannot be made up and are not awarded extensions, as low grades are dropped. If circumstances occur where you cannot take an exam at the scheduled time (e.g., documented illness, jury duty), proper documentation from an official authority must be provided within three days of the date the notice is issued. Your case will be reviewed to determine whether the excuse will be accepted and the exam date extended. There are no make-up assignments/opportunities for missed work or poor performance. **The final project will not be accepted late.**

Instructional Continuity Plan

Kennesaw State University (KSU) may decide to close campuses, operate on a delayed schedule, or transition to remote instruction for inclement weather or in case of emergency.

The University will announce campus closures, delayed schedules, or remote instruction through KSU Alerts sent to your cell number on file and to your university email account. In addition, announcements will be posted on KSU's home page: www.kennesaw.edu.

Our class continuity plan includes:

1. Communication: Please check D2L Brightspace or KSU e-mail for necessary instructions.
2. Virtual Classes: Synchronous sessions are virtual using MS Teams. Check D2L or email for the meeting link.
3. Assignments and Assessments: Deadlines for assignments and assessments may be adjusted to accommodate the emergency situation.

We understand that emergencies create unique challenges. If you need additional support during a KSU campus closure for an emergency, reach out via Brightspace or email. The university also offers resources such as counseling and academic support, which can be accessed remotely.

Policy on the Usage of Artificial Intelligence

AI Use Allowed, but Not Required:

In this class, you are welcome to use AI for any purpose. However, you should note that all AI generative tools still tend to make up incorrect facts and fake citations, code generation models tend to produce inaccurate outputs, and image/art generation tools can produce copied work or offensive products. You will be responsible for any inaccurate, biased, offensive, or otherwise unethical content you submit, regardless of whether it originally comes from you or an AI tool. If you use an AI tool, its contribution must be credited in your submission. The use of an AI tool without acknowledgement is cheating and constitutes a violation of the KSU Code of Academic Integrity.

Department or College Policies

Office Hours and Appointments Policy

A virtual meeting can be scheduled by appointment, based on my availability. Your request for a meeting with me must be made by D2L e-mail at least 36 hours before the desired date and time, and I will confirm or deny the request based on my availability. To help alleviate the possibility of scheduling conflicts, I recommend you offer multiple times that you are available. Also, I expect my students to make a sincere effort to adjust their schedules to meet with me within regular work hours (9AM – 5PM).

Email Turnover and Assignment Feedback Timeline

Emails will be answered within 24-48 hours during weekdays. Please allow extra time for responses sent during weekends or holidays.

Feedback and grades for assignments will be provided through D2L according to the timeline specified for each assignment. Pre-module guidelines and quizzes will be evaluated before the corresponding class meeting. Exam and project grades will be returned within two weeks after the exam.

Institutional Syllabus Policies, Procedures, and Resources

[Federal, BOR, & KSU Required Syllabus Policies and Student Resources](#)

Course Schedule

Tentative and subject to change.

Week & Date	Module	Content Covered	Assignments	Exams/Projects
1: May 28-30	Module 0 - Start Here (Orientation) Module 1 - General Discrete Random Variables Module 2 - Special Discrete RV & Random Number Generation	D2L Course Site Chapter 1	Flipped Learning Mastery Pre-lesson Guide Pre-Lesson Guide Quiz	
2: June 4 - 6	Module 3 - General Continuous RV Module 4 - Special Continuous RV and LLN Module 5 - CLT and Lognormal Distribution	Chapter 2	Flipped Learning Mastery Pre-lesson Guide Pre-Lesson Guide Quiz	
3: June 11-13	ASSESSMENT Module 6 - Important distributions in statistics (Pt 1)	Chapter 3	Flipped Learning Mastery Pre-lesson Guide Pre-Lesson Guide Quiz	
4: June 18-20	Module 6 - Important distributions in statistics (Pt 2) Module 7 - Data analysis and visualization	Chapter 4 Chapter 5	Flipped Learning Mastery Pre-lesson Guide Pre-Lesson Guide Quiz	Exam 1 – Modules 1-5

Week & Date	Module	Content Covered	Assignments	Exams/Projects
5: June 25-27	Module 8 (Pt1) - Parameter estimation (Method of Moments and MSE) Module 8 (Pt2) - Parameter estimation (Maximum Likelihood)	Chapter 6	Flipped Learning Mastery Pre-lesson Guide Pre-Lesson Guide Quiz	Exam 2 - Modules 6-7
6: July 2	Module 9 (Pt1) - Hypothesis testing	Chapter 7	Flipped Learning Mastery Pre-lesson Guide Pre-Lesson Guide Quiz	
7: July 9-11	Module 9 (Pt2)- Confidence intervals	Chapter 7	Flipped Learning Mastery Pre-lesson Guide Pre-Lesson Guide Quiz	
8: July 16-18 Final exam week	Group Project: Modules 1 - 9			Group Project