Contact Information

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Office: MATH 210 **Phone:** 765-494-4129

(Online) Intro to Statistics STAT-35000-001 DIS (Timothy G Reese)

Course Brightspace page: **Winter 2025 STAT 35000-001 DIS**

Instructional Modality: Online: Asynchronous

Additional Contact Information

Course Coordinator:

Dr. Timothy Reese **email:** reese18@purdue.edu
Office: MATH 210 **Phone:** 765-494-4129

Teaching Assistants:

Kyle Conrad **email:** conrad48@purdue.edu
Hyebin Han **email:** han805@purdue.edu

Communication and Consultation Hours:

- **Synchronous help**
  Office hours will be held online via WebEx.
  Instructor and **TA** office hours: by **appointment**.
  Please email both TAs to request an appointment, and one of them will schedule a WebEx meeting with you.

- **Email**
  For questions that need my attention, write to me using the subject line **"STAT 350: <topic>."** Email is our primary channel in the winter session. During the weekdays I usually reply in the late afternoon; replies on weekends may take longer than 24 hours.

- **Peer discussion board**
  Use the Brightspace **"Q & A for Peers"** board to ask classmates about concepts, homework, or quizzes, to share tips, and to work through challenging topics together. I will not monitor this board regularly, so rely on one another first. Keep posts courteous, respectful, and on topic. Click "Create New Thread" whenever you start a post.

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Course Description

(Credit Hours: 3.00) A data-oriented introduction to the fundamental concepts and methods of applied statistics. Exploratory analysis of data. Sample design and experimental design. Probability distributions and simulation. Sampling distributions. The reasoning of statistical inference. Confidence intervals and tests for one and two samples. Inference for regression, and correlation. Essential use is made of statistical software throughout. This course is designed for students that are required to perform statistical analysis in their disciplines.

Prerequisites:

This course requires completion of Calculus 2 as a prerequisite. Throughout this course, students must demonstrate proficiency in basic derivative and integral calculus through homework and exams. While more advanced topics may be introduced, please note that assessments will not exceed the difficulty level of Calculus 2.

Approximate Course Schedule

Chapter	Topic
1	Introduction – Why Study Statistics
2	Summarizing Data Using Graphs
3	Numeric Summary Measures
4	Probability
5	Random Variables and Discrete Probability Distributions
6	Continuous Probability Distributions
7	Sampling Distributions
8	Experimental Design
9	Confidence Intervals Based on a Single Sample
10	Hypothesis Tests Based on a Single Sample
11	Inference Based on Two Samples
12	The Analysis of Variance (ANOVA)
13a	Correlation and Linear Regression: Basic Model
13b	Correlation and Linear Regression: Correlation, Diagnostics, Inference

Our Statistics Philosophy:

This course leverages mathematical reasoning and computational skills in R to develop statistical intuition and insight. While these quantitative skills provide the foundation, the ultimate goal is to cultivate critical thinking that empowers you to interpret data accurately, evaluate evidence rigorously, and confidently make informed, data-driven decisions.

"Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write." - H.G. Wells

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Learning Resources, Technology & Texts

Digital Textbook (FREE): Access everything in one place: the open-access webbook at contains chapter-by-chapter notes, data sets, slide decks, searchable formulas, and R code snippets; the linked Video Learning Platform which hosts all 84 recorded lectures in syllabus order, displays run times, and splits longer sessions into short micro-segments with an interactive timeline for quick topic jumps, giving you about 29 hours of on-demand review.

Introductory Statistics: A Problem-Solving Approach (3th edition), author: Kokoska
ISBN: 13-978-1-319-4962-1 --- **OPTIONAL**

The textbook is used mostly for the derivations and extra examples that are not in the above textbook. In addition, this book contains practice problems which are not in the required textbook. This book is NOT required, but it is recommended.

Kokoska Website

Includes data sets, table downloads in pdf, and vocabulary flashcards. Optional but valuable resources provided for free by the publishers.

Brightspace

- Announcements and important changes, including due dates, will be posted on Brightspace. Make sure you enable announcements to be sent to your Purdue email account. It's your responsibility to read and keep track of them.
- Brightspace contains the syllabus, course schedule, reading material, tables, slides, videos and recorded sessions, and information for assignments and exams, and other resources.
- The majority of the Homework will be submitted on the Edfinity homework platform. Some assignments will be submitted on Brightspace, including reading quizzes and a syllabus assignment.
- Your grades will be posted on Brightspace, and it's your responsibility to ensure their accuracy. It may take up to 24 hours for Edfinity grades to be synced to Brightspace. If there is a mistake, you must inform your instructor electronically in a timely manner.

Edfinity—REQUIRED ($35)

All homework assignments will be delivered via the **Edfinity** online homework system platform. If the course is dropped within the first two weeks **Edfinity** offers a refund policy; see refund policy. To signup purchase and access **Edfinity** you should click on the first homework assignment link within Brightspace, and the process will be started automatically.

Hardware requirements

- A device which connects to the internet with a keyboard is required for using the R software package.
- A **web camera** and **microphone** are required for the online examination.

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Additional Software/web resources – we will also be using the following resources which are free of charge.

R/RStudio

- **Install R** (free language for statistical computing) and RStudio (user-friendly IDE) on your own computer; this is our recommended approach. Linked guide to Install R.
- Access R and RStudio through **Purdue's Scholar computing cluster** with BoilerKey; student accounts are preconfigured. Linked guide to access scholar.

Respondus Lockdown Browser – used for online delivery of exams.

- **Equipment:** Use a working microphone and a camera that shows both your face and writing area; most laptop webcams aren't wide enough, so an external camera may be required.
- **Visibility:** Keep your face and desk in view for the entire exam, ensure good lighting, and no obstructions.
- **Test Run:** Use the practice link beforehand on the same device and network to confirm everything works.
- **Video Demonstration:** Watch the provided video to ensure you adhere to exam requirements.

AI Tools Available: Our homework platform, Edfinity, features "Ask Anna," which is an AI-enhanced resources designed to support your learning. Be cautious of AI inaccuracies or "hallucinations" and verify AI suggestions against trusted sources.

Learning Outcomes

Course-Level Outcome 1: Statistical Literacy and Data Exploration

Develop statistical literacy by classifying data and variables, describing their structure, levels of measurement, and distributional characteristics, and applying exploratory data analysis techniques using appropriate terminology and graphical tools in R to communicate insights effectively.

Course-Level Outcome 2: Probability and Sampling

Apply foundational probability rules and distributional models to solve problems involving random variables and explain how sampling behavior supports inference through the Central Limit Theorem.

Course-Level Outcome 3: Statistical Inference and Modeling

Conduct statistical inference to draw defensible conclusions from data by selecting procedures aligned with study design, variable types, and sample structure; construct and interpret confidence intervals and hypothesis tests, justify decisions with p-values and context, and manage Type I and II errors and power. Apply ANOVA with appropriate multiple comparisons for group differences, and model relationships with simple linear regression, interpreting parameters, correlation, and diagnostics to inform data-driven decisions.

Course-Level Outcome 4: Reproducible Statistical Analysis in R

Use R to import, manage, and tidy data; generate exploratory graphics; perform simulations and inferential procedures; and communicate results through clear, reproducible workflows for both technical and non-technical audiences. Conduct and interpret simulation studies in R to examine assumptions and performance, including Central Limit Theorem behavior, power, Type I and II error, and empirical interval coverage.

STAT 350 (WINTER 2025) **Introduction to Statistics**

How to Succeed in this Course

This Winter Session compresses an entire 16-week semester into eleven instructional days. Treat it like a full-time internship: plan on **at least eight focused hours every instructional day**. Success hinges on daily engagement and disciplined pacing.

1. Follow the daily learning cycle

- **Absorb (≈ 4 hrs):** Complete the assigned reading and watch the segmented lecture videos. Use the search bar and timeline in the video viewer to target topics you find challenging.
- **Apply (≈ 4 hrs):** Work through the Edfinity homework and computer assignments on scratch paper or tablet first, then submit online. You have ten attempts and instant feedback; use each try to learn, not to guess. Record any steps that slow you down or confuse you, then review those notes when you study for the exams.
- **Assess (20 mins):** Take the timed daily quiz in Brightspace. Quizzes mirror the more theoretical questions of the proctored midterm (Day 6) and final (Day 11).
- **Review (≈ 1 hr):** Check posted solutions, revisit video segments, and post or answer questions on the Brightspace peer board. Logging knowledge gaps now prevents surprises later.

2. Schedule and habits

- **Log in every morning** to note deadlines and announcements. The accelerated calendar leaves no buffer for catching up.
- **Work ahead when possible** but never fall behind the suggested pacing; quizzes lock at midnight Eastern. If you get behind at any point you will probably need to drop the course.
- **Keep tidy notes**. Exams are closed-book except for your handwritten or printed notes.

3. Communicate promptly

- **Email** with the subject "STAT 350: <topic>." Weekday replies come during the posted window; weekend replies may take longer than 24 hours.
- **Office hours** via WebEx are listed in Brightspace. Drop in as soon as confusion arises.
- **Peer board** is your quickest help line; answer a classmate's question whenever you can—teaching others is the best way to improve your own learning.

4. Use the resources

- **Course Digitial Textbook**: lectures, notes, data, slides, formulas, code, quizzes.
- **Video library**: 84 indexed recordings with micro-segments for fast review.
- **Practice Exam Materials**: Practice materials from other semesters are available for your benefit within the course digital textbook.
- **Edfinity feedback loop**: learn from mistakes, then correct them.
- **Computer-assignment tutorials**: walk through each example before tackling the assignments.

Stay disciplined, stay connected, and respect the pace. Miss a day and the material will race ahead of you; treat each day with the focus of a full-time internship and you'll cross the eleven-day finish line with mastery and confidence.

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Grading Policy

Final course grades are determined by the following weights.

Category	Percentage
Quizzes	10%
Homework (including computer assignments)	34%
MIDTERM Exam	24%
Final Exam	32%
TOTAL	100%
Course Evaluation (BONUS)	1%

The grades indicate an overall measure of student achievement and accomplishment. Therefore, we ***do not curve the grades*** except for unusual circumstances.

The letter-grade cutoffs for this course are approximately:

³ 90 **A-/A/A+/** **[80, 90)** **B-/B/B+**
[70, 80) **C-/C/C+** **[60,70)** **D-/D/D+** **<60** **F**

Letter-grade cutoffs are **approximate** and may shift slightly based on overall assessment performance. Any adjustment will be **small** and will **not raise** thresholds (i.e., adjustments may make grades easier to earn, not harder).

A grade of incomplete (I) will be given only in unusual circumstances. To receive an "I" grade, a written request must be submitted **prior to the date of the final exam** and approved by the instructor. The request must describe the circumstances, along with a proposed timeline for completing the course work. Submitting a request does not ensure that an incomplete grade will be granted. If granted, you will be required to fill out and sign an "Incomplete Contract" form that will be turned in with the course grades. Any requests made after the course is completed will not be considered for an incomplete grade.

We reserve the right to change the grading scheme should unusual circumstances demand it.

Daily Quizzes (10%):

Brief 20-minute quizzes will be given at the start of selected class sessions, covering material from recent chapters. Each quiz is worth 10 points and consists of true/false questions (1 point each) and multiple-choice questions (2 points each). The lowest two quiz scores will be dropped from the final grade calculations. No make-up quizzes will be offered. These quizzes encourage regular participation, reinforce key concepts, and provide immediate feedback of your understanding of course material.

Course Evaluation (1%):

For Winter 2025, the anonymous online course evaluation for this class will be open **Tuesday, January 6 through Friday, January 9, 2026**. During this window, you will receive an email from **Instructional Data Processing** at your Purdue email address with a direct link to the survey. Your feedback is used by me, the department, and the university to improve this course and future **Winter Session** offerings; results are only released after final grades are submitted. If at least **80%** of enrolled students complete the evaluation by **January 9, 2026**, every student will receive **1% extra credit** added to their final course percentage.

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Homework (34%):
The majority of the homework assignments which include computer assignments will be on **Edfinity**. The syllabus assignment is located on Brightspace.

The assignments will be due the day following the reading material before midnight. The due dates are clearly marked on both Brightspace and **Edfinity**. No late submissions will be accepted due to the accelerated pace of the winter session.

Homework:

> **Homework Assignments (No dataset):** The homework assignments are different from the computer assignments in that they do not require an explicit data set. You will have 10 tries for the free response problems and 3 for multiple choice problems.
>
> **Computer Assignments (Dataset)**: Computer assignments use a provided data set; homework problems do not use the provided data set; although, they still may require computer software.

The lowest homework and computer assignment will be dropped at semester's end.

Exams (midterm exam – 24% and final exam – 32%):
We will use Respondus LockDown Browser. Respondus is an online proctoring program that has been approved for use by the university and is a free addition to Brightspace. It is a special browser that makes the exam access the only thing available on the computer during the exam. The software's own scientific calculator, special keys, and links provided within the exam will also be available.

- This method requires students to have a desktop or a laptop. Tablets are not supported.
- Students need a 2Mbps internet connection or better.
- Students are required to have a Windows OS or MacOS operating system.
- The exams will be closed book but we allow open notes during the exam. Even though this is an open note exam, we strongly suggest that you use crib sheets to condense the information. You may not use a tablet/ipad on the exam.
- It is strongly suggested that you have a calculator available, although you will be able to use the scientific calculator in the Lockdown Browser during the exam.
- If a statistical table is needed (as mentioned in the review materials), its URL will be allowed by the LockDown Browser; however, it is recommended that you have a physical copy printed.

The **exams** are on the following 24-hour windows:

- **Midterm Exam** is open for 24 hours on the **6th instructional day (December 31st).** Once you begin the exam you will have 80 minutes to complete the exam before it closes.
- **The Final Exam** is open for 24 hours on the **11th instructional day (January 9th).** The final exam will be a comprehensive two-hour assessment, covering the full scope of the course. It will predominantly focus on the material covered post Exam 1 (approximately 70%), while also revisiting key concepts from Exam 1 (approximately 30%). This structure ensures a thorough evaluation of your understanding of the entire course content.
  Once you begin the exam you will have 140 minutes to complete the exam before it closes.

No formulas will be provided.

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No Make-up Exam Policy:

Due to the condensed nature of the winter session course, there is no opportunity for make-up exams.

Academic Integrity

Purdue Honors Pledge

You are expected to uphold The Honor Code of Purdue University. The Purdue Honor Pledge is: "*As a boilermaker pursuing academic excellence, I pledge to be honest and true in all that I do. Accountable together - we are Purdue."* There is more information at https://www.purdue.edu/odos/osrr/honor-pledge/about.html.

Academic integrity is one of the highest values that Purdue University holds. Individuals, including students, are encouraged to alert university officials to potential breeches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information that is submitted provides the greatest opportunity for the university to investigate the concern. More details are available on our course Brightspace table of contents, under University Policies.

AI Usage Policy

In this course, AI tools (such as ChatGPT, Claude, or other large language models) may be used according to these guidelines:

Permitted Uses:

- After attempting homework problems yourself, you may use AI to check your reasoning or get hints
- To help understand statistical concepts after reading the textbook/attending lecture
- For coding assistance in R (debugging, syntax help) AFTER attempting the code yourself
- To explore alternative approaches to problems you've already solved or generate practice problems

Prohibited Uses:

- Using AI to generate complete solutions to homework or computer assignments
- Submitting AI-generated code or text as your own work
- Using AI during exams (this constitutes academic misconduct)
- Having AI complete assignments without your own substantial effort

Important: You are responsible for understanding and being able to explain any work you submit. If you cannot explain your solution during office hours or on an exam, this indicates over-reliance on AI. Remember: homework is practice for exams where AI is not available.

Violations of this AI policy will be treated as academic misconduct and reported to OSRR.

Penalties for Misconduct:

Violations of academic integrity will be handled by the course coordinator and referred to the OSSR (https://www.purdue.edu/odos/osrr/) for review at the university level.

Any cheating on exams will result in an “F” in the course. This includes communicating details of an exam to other students who have not yet taken the exam and/or using non-approved materials when taking the exam.

Cheating on computer assignments, homework, quizzes, and exams will result in a zero for that

assignment. Cheating includes but is not restricted to copying another person's work, allowing another person to copy your work, allowing AI to complete your assignment for you, and copying previously posted keys or keys posted on the internet. It is considered cheating if any student uploads any STAT 350 course material to ANY website or shares the information electronically. In addition, **it is considered cheating to use sites like Course Hero, Quizlet, or Chegg to either ask others to do your homework for you.**

In STAT 350, we encourage students to work together. However, there is a difference between good collaboration and academic misconduct. We expect you to read this list; you will be held responsible for violating these rules. We are serious about protecting the hard-working students in this course. We want a grade for STAT 350 to have value for everyone. We punish both the student who cheats and the student who allows or enables another student to cheat. Make sure that you are doing everything you can to protect the value of your work on exams, homework, discussion posts, and even class participation and studying.

Good Collaboration:

- Begin each assignment on your own before discussing tough parts with others.
- Ensure personal understanding and individual completion of assignments.
- Engage in group discussions for conceptual clarity but avoid direct sharing of answers (comparing answers is okay).
- Utilize group settings to explain and clarify concepts, not to divide and conquer assignments.
- Use the Brightspace peer board to ask conceptual questions, share strategies, and point to relevant sections of the webbook or textbook.
- When posting on public forums, describe your approach, show a small, non-identifying snippet if needed, and ask for guidance rather than answers.

Academic Misconduct:

- Dividing the assignment among a group and swapping finished answers.Post answers to a homework question publicly on Brightspace discussion board.
- Posting worked solutions, answer keys, full code, screenshots of problems, or assessment content on Brightspace or any public forum.
- Soliciting or providing step-by-step solutions on external sites or group chats, paid or free.
- Attend a group work session without having first attempted the problems yourself.
- Letting others copy your work, freeloading on group efforts, or submitting work produced by someone else or by AI as your own.
- Have a tutor or TA work though all of your homework problems for you. This includes referring to electronically posted materials as well as asking questions to any tutoring service, like Chegg, CourseHero, etc.
- Uploading any STAT 350 materials to external sites or sharing them beyond the course.

Learning Remotely

We want to foster a safe online learning environment. All opinions and experiences, no matter how different or controversial they may be perceived, must be respected in the tolerant spirit of academic discourse. You are encouraged to comment, question, or critique an idea, but you may not attack an individual. Our differences, some of which are outlined in the University's Nondiscrimination Policy Statement, will add richness to this learning experience. Please consider that sarcasm and humor can be misconstrued in online interactions and generate unintended

disruptions. Working as a community of learners, we can build a polite and respectful course ambience by observing the following guidelines for this course:

- Monitor how much space/time you are taking up in any discussion. Give other students the opportunity to join in the discussion.
- Do not use offensive language. Present ideas appropriately.
- Be cautious in using Internet language. For example, do not capitalize all letters since this suggests shouting.
- Avoid using vernacular and/or slang language. This could lead to misinterpretation.
- Keep an "open mind" and be willing to express even your minority opinion.
- Think and edit before you push the "Send" button.
- Seek and take in feedback from others; learning from other people is an important life skill.

Nondiscrimination Statement

Purdue University and I are committed to maintaining a community which recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her own potential. The University believes that intellectual and cultural diversity among its many members strengthens the institution, stimulates creativity, promotes the exchange of ideas, and enriches campus life.

Purdue University views, evaluates, and treats all persons in any University related activity or circumstance in which they may be involved, solely as individuals on the basis of their own personal abilities, qualifications, and other relevant characteristics.

Purdue University prohibits discrimination against any member of the University community on the basis of race, religion, color, sex, age, national origin or ancestry, genetic information, marital status, parental status, sexual orientation, gender identity and expression, disability, or status as a veteran. The University will conduct its programs, services and activities consistent with applicable federal, state and local laws, regulations and orders and in conformance with the procedures and limitations as set forth in Purdue's Equal Opportunity and Equal Access policy which provides specific contractual rights and remedies.

Any question of interpretation regarding this Nondiscrimination Policy Statement shall be referred to the **Vice President for Ethics and Compliance** for final determination.

Accessibility

Purdue University strives to make learning experiences accessible to all participants. If you anticipate or experience physical or academic barriers based on disability, you are encouraged to contact the Disability Resource Center at: **drc@purdue.edu** or by phone: 765-494-1247, as soon as possible.

If the Disability Resource Center (DRC) has determined reasonable accommodations that you would like to utilize in my class, you must send me your Course Accommodation Letter. Instructions on sharing your Course Accommodation Letter can be found by visiting: **https://www.purdue.edu/drc/students/course-accommodation-letter.php** Additionally, you are strongly encouraged to contact me as soon as possible to discuss implementation of your accommodations.

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Mental Health/Wellness

If you're struggling and need mental health services: Purdue University is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact Counseling and Psychological Services (CAPS) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS office on the second floor of the Purdue University Student Health Center (PUSH) during business hours.

If you find yourself beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, try Therapy Assistance Online (TAO), a web and app-based mental health resource available courtesy of CAPS**.** TAO is available to you at any time by creating an account on the TAO Connect website, or downloading the app from the App Store or Google Play. It offers free, confidential well-being resources through a self-guided program informed by psychotherapy research and strategies that may aid in overcoming anxiety, depression, and other concerns. It provides accessible and effective resources including short videos, brief exercises, and self-reflection tools.

If you need support and information about options and resources, please contact or see the Office of the Dean of Students. Call 765-494-1747. Hours of operation are M-F, 8 a.m.- 5 p.m.

If you find yourself struggling to find a healthy balance between academics, social life, stress, etc., sign up for free one-on-one virtual or in-person sessions with a Purdue Wellness Coach at RecWell. Student coaches can help you navigate through barriers and challenges toward your goals throughout the semester. Sign up is free and can be done on BoilerConnect.

Basic Needs

Any student who faces challenges securing their food or housing and believes this may affect their performance in the course is urged to contact the Office of the Dean of Students for support. There is no appointment needed and Student Support Services is available to serve students 8 a.m.-5 p.m. Monday through Friday.

Emergency Preparedness

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted on Brightspace or can be obtained by contacting your instructor via email at reese18@purdue.edu. You are expected to read your @purdue.edu email on a frequent basis.

There is additional information concerning emergency preparedness in the syllabus module on Brightspace.

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