Syllabus

Math 115: Introduction to Statistics

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MATH 115 Introductory Statistics

Hope College - Fall 2026

Course Information	Details
Location	SCICTR 3031/3033
Meeting Times	Section 115.01: MWF 8:30–9:20; Section 115.05: MWF 1:00–1:50
Credit Hours	3
Instructor	Brian Yurk
Email	yurk@hope.edu
Office	VWF 215

Course Information	Details
Office Hours	M 10:00-10:50, W 12:00-12:50, R 11:00-11:50, or by appointment

Course Description

The course introduces statistical inference (including confidence interval estimation) for one and two variables using simulation-based methods and then shows how traditional theory-based methods like t-tests, chi-square tests, one-way analysis of variance can also be used. Basic descriptive statistical techniques are reviewed throughout the course and other descriptive techniques such as simple linear regression are introduced. Throughout the course there is an emphasis on conceptual understanding, the entire statistical investigation process, and active learning using group activities and projects, as well as reading and critiquing published research. Cannot receive credit for both Math 115 and MATH 219.

Text

We will be using the text **Introduction to Modern Statistics (2e)** by Mine Çetinkaya-Rundel and Johanna Hardin. The text and materials are available at https://www.openintro.org/book/ims/. There are free web and pdf versions of the text available at the website, and you can order a print version if you would like to.

Software

Most statistical analyses, whether based on simulation or mathematical models, are performed using statistical software. Jamovi is an open-source Statistics program that you can install for free on your own computer (Mac or Windows). We will use Jamovi to do Statistical calculations along with a Jamovi module called **Randomize** that has been built specifically for our MATH 115 course.

Calculator

Students will be expected to have access to a scientific or graphing calculator for tests, quizzes, and readiness checks. Phones, laptops, and other devices that can communicate are not allowed on tests and quizzes.

Instruction

This is a *flipped* class. Before each class meeting, you are expected to prepare by working through the assigned **slides and narrated lecture** for the day — these are the primary source for the material. Each slide deck points to the relevant sections of the textbook; reviewing those sections before class is helpful, but not required. The materials for each class meeting are linked from the schedule. A brief **readiness check** at the start of class will help confirm you are prepared.

Class time is for *doing*. We will work problems and examples together, answer your questions from the prep materials, run analyses in Jamovi, work in groups on the final project, and complete quizzes and tests. Some in-class activities will be submitted for a grade. Three Jamovi labs support this work: the first gets you oriented in the software — importing data, setting variable types, filtering and recoding, and summarizing one variable at a time; the second builds on those data-handling skills and adds inference for proportions; the third, later in the course, extends randomization-based methods to means. We begin labs in class and finish them outside when needed. MyOpenMath provides additional online homework completed outside of class.

Cooperative Learning Groups

Many in-class activities are completed in groups. I assign the groups, and they change multiple times during the semester so that you work with a range of classmates.

The purpose of these groups is collaborative learning, not competition. You are working to understand the material together.

On some group assignments you will be asked to rate your group members' contributions, and those ratings will factor into individual grades on that assignment. Your group is responsible for making sure that only the names of students who contributed appear on the submitted work.

Groups also matter on tests. If your group's average score on an in-semester test is above 80%, each member receives a bonus of 3 percentage points on their individual score — a 78 becomes an 81. On the final exam, the bonus is 2 percentage points. No score exceeds 100% after the bonus.

Anchor Plan Student Learning Outcomes (SLOs)

This course is designed to address the following Anchor Plan SLOs:

1. Examine fundamental or emerging questions about humanity, the natural world, and God by seeking answers through different modes of inquiry.
2. Analyze evidence or data to solve problems, reach informed conclusions or make sound judgements

Evaluation

Grades will be determined as follows:

Assignment Type	Weight
Attendance, in-class participation, in-class activities	14%
Online homework (My Open Math/Moodle)	3%
Jamovi labs, other assignments	3%
Final project	10%
Readiness checks	5%
Quizzes	15%
In-semester tests (2)	30%
Final exam	20%

To account for unexpected absences, etc, your lowest quiz score and lowest homework score will be dropped when calculating your final grade. The drops are earned, not automatic: you must visit office hours and the Math Lab as described in the Dropped Quiz and Homework Policy.

Grading Scale

Your final letter grade will be determined using the following scale:

Grade	Range	Grade	Range	Grade	Range
A	93-100%	B-	80-82%	D+	67-69%
A-	90-92%	C+	77-79%	D	63-66%
B+	87-89%	C	73-76%	D-	60-62%
B	83-86%	C-	70-72%	F	0-59%

Attendance & Participation

Attendance is very important — to your own success in this class and to the success of your group — and is considered mandatory. If you must miss a class (illness, scheduled college event, family matters, etc.) you should inform your instructor and your group members ahead of time if at all possible.

Final Exam Date

The final exam time depends on your section:

Section	Final Exam
115.01	Thursday, December 17, 9:00–11:00 am
115.05	Wednesday, December 16, 12:30–2:30 pm

Special Note: Do not arrange travel without confirming the dates of your final exams/projects, as dictated by the Office of the Provost.

Schedule

The course schedule, including weekly topics and section-specific meeting details, is available on the schedule page.

Policies & Statements

AI Use Policy

Overall Course AI Status: 🟡 **Yellow** — AI is allowed in specific, clearly defined ways and never on readiness checks, quizzes, tests, or the final exam.
AI is a tool, not a replacement for your statistical thinking. The goal is for you to be able to reason with data and make sound decisions in the real world.

Readiness Checks, Quizzes, Tests, Final Exam — 🔴 Red (AI not allowed)

You may not use generative AI (ChatGPT, Gemini, Claude, Copilot, etc.) in any way on readiness checks, quizzes, tests, or the final exam.
Why? These assessments measure your understanding. If AI does the thinking, grades do not reflect what you can do, and that hurts you in later courses and in the real world. Using AI on red-light assessments is academic dishonesty.

In-Class Activities (Not Readiness Checks, Quizzes, or Tests) — 🟡 Yellow

AI use is sometimes allowed for in-class practice, with my guidance.
Allowed (when I say it's okay for that activity):

- Asking AI to re-explain a concept (e.g., "Explain p-values in simple terms.")
- Asking AI to check your understanding of an idea
- Asking for alternative examples if one from class didn't click

Not allowed:

- "Here's my assignment—give me all the answers."
- Copying AI solutions or letting AI do the full problem for you
- Using AI to write explanations you don't understand

Why? Class time is where your brain gets "reps." AI can act like a tutor—offering hints and explanations—but you must still do the thinking.

Homework (Out of Class) — 🟡 Yellow

AI can be a helpful assistant, but not a "do my homework" engine.
Allowed:

- Clarifying concepts (e.g., "What's the difference between a parameter and a statistic?")
- Getting step-by-step guidance after you try the problem
- Asking AI to generate extra practice questions

Not allowed:

- Copying AI-generated answers and submitting them as your own
- Relying on AI so heavily that you can't redo the problem yourself later

If I ask you to explain or redo a homework problem without AI, you should be able to.

Jamovi Labs — 🟡 Yellow

Because many of our analyses rely on the custom **Randomize** module, AI tools will often give incorrect or generic advice about the statistical steps themselves — expect limited help there. Where AI is more useful is on the data-handling side: getting the data into the right shape before you run an analysis.
Allowed:

- Getting hints on filtering rows, recoding variables, or computing new variables in Jamovi
- General Jamovi navigation and interface questions (finding a menu, understanding a setting)
- Troubleshooting data-import issues or unexpected error messages
- Clarifying the statistical concept behind an analysis step

Not allowed:

- Pasting the lab prompt (or dataset) and submitting AI-generated answers
- Having AI decide which test to run or write your interpretations for you
- Using AI-generated prose in your lab report that you can't explain in your own words

You should be able to redo any analysis and re-explain any result in your lab report without AI assistance.

Study Aids & Exam Prep — 🟢 Green (Encouraged, with caution)

You are encouraged to use AI to support your studying:

- Summarizing topics you've already learned (e.g., "Summarize the main ideas of confidence intervals for a beginner.")
- Creating practice questions or flashcards
- Asking for alternative explanations of confusing ideas
- Having AI quiz you on concepts and then checking your answers
- Using a narrated lecture transcript or your notes as context for AI to summarize or generate practice questions

Use caution: Always double-check formulas and key ideas against class notes or the textbook. AI can be confidently wrong.

Course Project — 🟡 Yellow

AI may support your project but cannot do the project for you.
Allowed:

- Brainstorming research questions and ideas
- Polishing drafts you wrote (clarity, flow, grammar)
- Getting help with sentence-level wording
- Finding possible topics or sources (you must verify actual sources yourself)

Not allowed:

- Having AI write major sections (intro, methods, results, discussion)
- Letting AI choose tests, run the analysis, or interpret output for you
- Using AI-generated text or analysis you can't explain in your own words

You are responsible for the statistical thinking and decisions in your project.

Things You Should Never Do with AI — 🔴 Red

- Share sensitive personal information (yours or others'): student ID, financial info, detailed health info, etc.
- Upload or share readiness checks, quizzes, tests, or exam questions with AI tools.
- Use AI to evade policies (e.g., "rewrite this so it passes plagiarism detectors").
- Treat AI as automatically correct; always check it against course materials and your own understanding.
- Represent AI-generated work as entirely your own when it is not.

Transparency: How I Use AI as Instructor

I use AI tools extensively in developing this course. For example, I use AI to:

- Draft and refine course documentation, policies, and resource guides
- Create and organize course website content
- Draft, refine, and test assignments/assessments
- Draft and refine slides
- Generate audio for narrated lectures

I always review and edit AI-generated content before it reaches you. I may experiment with using generative AI to assist with grading, but I am responsible for the results. Any personal data is handled in accordance with Hope College's data privacy policies.
If you are ever unsure whether a particular use of AI is appropriate, please ask. I'm happy to help you use these tools in ways that support your learning rather than replace it.

ℹ Collaboration Policy

MyOpenMath Homework

MyOpenMath homework is intended as individual practice. You may discuss concepts and general approaches with classmates, but your answers must be your own.

Jamovi Labs

You may work with classmates on Jamovi labs — discussing how to set up an analysis, interpreting output together, and helping each other troubleshoot. Each student must submit their own written report, in their own words.

In-Class Activities

For in-class activities other than readiness checks, quizzes, and exams, collaboration is allowed unless I specify otherwise for a particular activity. You may discuss ideas, compare approaches, and help each other work through problems. Many of these activities are completed in assigned groups and submitted as group work; only the names of students who contributed belong on the submission. When an activity is submitted individually, your written work and answers must be your own.

Readiness Checks, Quizzes, and Exams

Readiness checks, quizzes, and exams are to be completed individually without collaboration. One or more quizzes may be designated as group quizzes instead.

Final Project

The final project is a group project — you are expected to share the work with your group members and contribute fairly. Each group member should understand and be able to explain all parts of the project. You may discuss ideas with classmates outside your group, but the work submitted must be your group's own.

i Late Work Policy

- Late work will not be accepted in this class.
- You must be present in class to receive credit for in-class activities.

Exceptions

Exceptions to the late work policies outlined above will only be made for excused absences, as defined by Hope College policies. If you believe you have a valid reason for an exception, please contact the instructor as soon as possible to discuss your situation.

i Dropped Quiz and Homework Policy

Your lowest quiz score and your lowest homework score will be dropped at the end of the semester. To qualify, you must complete **both** of the following:

- **Office hours:** Visit my office hours at least once before the end of week 8 and ask questions about the course material. If you cannot attend scheduled office hours, make an appointment.
- **Math Lab:** Visit the Math Lab for group tutoring at least twice during the semester, with your first visit before the end of week 8. See Math Lab sessions for times and locations.

Completing only one requirement earns neither drop.

Diversity, Equity, and Inclusion Statement

It is my intention that every student has the opportunity to grow and flourish in this class. A crucial part of this is that each and every student deserves to feel safe and that they belong in the class. Each of us has a role in working toward creating an inclusive environment, even if doing so requires us to speak out and causes us discomfort sometimes.
The diversity that students bring to this course is viewed as an asset, and this course will function in a manner that respects and values that diversity, including race, ethnicity, gender identity, sexuality, disability, age, socioeconomic status, nationality, religion, and culture. Please let me know if anything said or done by the instructor or other students in the class leads to hurt or offense. Such actions, even when unintentional, are deserving of attention.
Racist and discriminatory policies and ideas present obstacles to student flourishing and do not reflect the values of this course. It is my intention that this course and its policies promote equal representation and equitable outcomes among groups. Please let me know if you have ideas for improving this course or its policies in ways that make it more effective for you or for other students or groups. I value your perspective, and I take it seriously.

Other Policies & College Resources

Accommodations

If you have questions about access or are a student needing accommodations for a disability, please contact me. I will ask that you connect with Disability and Accessibility Resources if you haven't already.

Academic Honesty & Integrity

> As it seeks to fulfill its mission, the Hope College community assumes each of its members will operate with integrity and honesty, with a sense of personal responsibility, and with mutual trust and concern toward others in all facets of the life of the college. In order to apply this principle to academic life in a fair and consistent manner, the following policies have been adopted to clarify the expectations regarding conduct, and to establish a set of procedures for dealing with situations which violate these expectations.
>
> *-Preamble, Code for Academic Integrity at Hope College*

More information about Academic Integrity can be found at: https://hope.edu/offices/student-development/policies-resources/student-handbook.html#academic-integrity

Short-Term Absence Policy

Hope College recognizes that life events may unexpectedly interrupt an academic semester, including needing time away from campus. Thus, the purpose of a formal process for short-term, temporary absence is to improve the student experience so that they may continue progress in a course of study if unable to attend and participate in person while seeking treatment and/or recovering from a medical or mental health event, a family emergency/crisis, or other extraordinary circumstance. View the entire Short-Term Temporary Absence Policy.

If a situation arises (such as medical treatment or family bereavement) that requires a longer absence, please complete the short-term absence form to ensure that appropriate documentation is provided to the CARE team.

Excessive Absence Policy

Hope College encourages students to regularly attend class and allows faculty to develop their own classroom attendance policies. Attendance and participation in class are vital components of a residential college experience. View the entire Excessive Absence Policy.
The Hope Health Center does not provide medical excuses for missed classes, exams, or assignments, as medical conditions are confidential and often not verifiable. This is in alignment with the Academic Medical Excuse Policy and consistent with the recommendations of the American College Health Association. Thus, instructors cannot request documentation from the Hope Health Center.
Special Note: Only arrange holiday travel after confirming the dates of your final exams/projects, as the Office of the Provost dictates.

Student Complaint

Hope College is committed to the appropriate resolution of complaints as efficiently and effectively as possible. Providing a mechanism to hear complaints allows us to improve our services. Students are encouraged to speak directly to other Hope community members to resolve conflict and/or seek an informal resolution of the dispute directly with the other community member(s) whenever possible. Please use this Complaint form when such a resolution is impossible.

Safety & Emergency Preparedness

Students should dial **911** (the United States' primary emergency response system) from any phone if they or someone else experiences a medical or mental health emergency. Students can also contact Hope College's Campus Safety Office **(616-395-7770)** in any kind of emergency situation, and Campus Safety will contact the necessary emergency response service. You can learn more about specific emergency instructions on their webpage. Students can sign up for emergency text message alerts at **plus.hope.edu**.

Inclement Weather

Campus Safety sends emergency notification texts, including notices of weather-related closures, via the **HOPE ALERT system**. A decision to close campus offices and cancel classes is typically announced before **6:30 AM**. More information regarding inclement weather notifications can be found on Campus Safety's webpage.

Academic Assistance Statement

The Academic Success Center (ASC) offers all students various free services (e.g., tutoring, testing strategies, time management resources). The ASC is located in Van Zoeren Hall–immediately adjacent to the Van Wylen Library second-floor entrance. To contact the ASC send an email to **asc@hope.edu** or call **616-395-7830**.

Counseling and Psychological Services (CAPS)

Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressures, relationship challenges, alcohol or other drugs, financial concerns, identity development, body image, etc.
If you are experiencing similar concerns, we encourage you to seek support. Hope College Counseling and Psychological Services (CAPS) is a free and confidential resource. Call **616-395-7945**, or visit the top floor of the Bultman Student Center to find the right support for you.
If the source of your stressors is academic, please contact me or academic advising to find solutions together.

Disclaimer

This syllabus is subject to change. If changes occur, students will be notified in class or through an email or Moodle announcement.