

Introduction and Course Overview

Course Logistics

Email:

- Use the course name (STAT 3470) in the subject line of any email communication to ensure I see it and can respond.
- Communication directly to my email (cleymaet.2@osu.edu) or via Carmen's messenger and discussion boards are the best ways to reach me. I will respond within 48 hours during normal working hours.
- Make an effort to check first if the question is already answered in the syllabus, the notes, the textbook, or a general announcement or discussion board post before asking over email.
- Consider whether your question might be a general content question better suited to the Carmen discussion board before sending it via email.

The **syllabus** is posted in Carmen, along with a tentative schedule. You are expected to review it and be familiar with its contents.

Course Structure: Lectures

- Approximately 3 hours of video lecture will be posted to Carmen weekly.
- The week's content schedule will be posted on Tuesdays, and this will be the primary lecture posting day. If lectures are split between two topic areas (and correspondingly, distinct homework assignments), some lectures may be posted on Friday
- Please follow lectures carefully. They will be the primary avenue for presenting course content, and may cover content beyond the textbook.
- Incomplete slides will be posted in Carmen which I will annotate in video lectures. I will **not** post annotated notes for pedagogical reasons (active participation, e.g. writing, has been clearly shown to aid in understanding and memory retention, and my lecture annotations are not intended as comprehensive notes).

Course Structure: Discussion Boards

- Discussion boards on Carmen are available as a convenient spot to ask questions on course material.
- Please **do not** post homework solutions on the discussion boards.
- You are welcome to discuss and answer other students' questions. I will also check discussion boards frequently to answer questions.
- Feel free to post requests for me to elaborate further on topics covered in lecture, or for topics not covered in lecture you may be interested in. I will do my best to accommodate these requests where possible or to refer you to additional resources to explore further.

Homework

- Homework will be assigned throughout the summer via WebAssign. You are responsible for logging into Carmen and WebAssign regularly to ensure you are keeping up with announcements and assignments.
- I recommend you log in to WebAssign as soon as possible to verify there are no technical issues well in advance of the first assignment. Resources, including a schedule of office hours with a WebAssign representative who can help resolve any technical issues, will be posted on Carmen.
- Each assignment will be equally weighted.
- To accommodate WebAssign's sometimes picky tendencies with solution formatting, overall homework grades will be increased by 5%.

WebAssign and How to Approach Homework

- You should write out full solutions to problems (as if you were submitting written homework) before entering final answers into the boxes that WebAssign will check.
- If you're having trouble figuring out how to approach a problem, try checking your notes and the posted course materials first, but seek additional help if necessary.
- If your submitted response is graded as incorrect, carefully review your solution and revise as necessary before submitting an updated answer. If you're struggling to figure out why your solution is incorrect, don't hesitate to ask for help:
 - If you have a specific conceptual/course content question, it may be appropriate for posting on a Carmen discussion board. *Please do not post problem solutions in the discussion boards.*
 - I am available over email and in my office hours (posted in the course syllabus) to answer conceptual questions or more specific concerns, and TAs hold shared office hours through the MSLC and can help as well. Please have your partial work prepared when asking questions related to specific homework problems.

Exams

- There will be 3 Exams: a first midterm covering probability, a second midterm covering statistics, and a comprehensive final exam.
- Each exam will be available for a 48-hour period, with no additional time constraints.
- You are permitted to access posted course materials and your personal course notes during the exam.
- You are **NOT** permitted to discuss the exam with other students or to use online resources outside posted course materials for reference during the exam.
- Your highest exam score will be weighted as 30% of your final grade, with the other two making up 20% each.
- **Curves:** I will “curve” grades for each exam. The curve will **not** be based on performance relative to other students. Rather, I will evaluate each exam to determine which point values correspond with the level of understanding which should earn an “A,” “B,” “C,” etc., and adjust raw scores appropriately.

Instructor Responsibilities

- Clearly present course material, including practical motivation and application where possible.
- Answer student questions clarifying and elaborating on concepts covered in course.
- Assign homework to develop students' understanding.
- Design exams to effectively evaluate and reinforce students' understanding.
- Assign grades fairly and in a way that accurately reflects the development of students' knowledge and ability.

Student Responsibilities

- Review prerequisite materials if necessary. This course assumes fluency in calculus and elementary algebra.
- Approach homework with the goal of developing understanding of course topics.
- Log in frequently to Carmen and WebAssign to complete course materials and stay up-to-date on announcements and newly posted materials.
- Ask questions when necessary to further understanding of course material.
- Complete assignments by posted deadlines.
- Put forth a reasonable effort to engage with and learn course content.

Succeeding in this Course

- It is **NOT** enough to:

Succeeding in this Course

- It is **NOT** enough to:
 - Log in once a week and complete the week's content in one sitting or one day.

Succeeding in this Course

- It is **NOT** enough to:
 - Log in once a week and complete the week's content in one sitting or one day.
 - Watch the lectures and copy down the exercises and annotations.

Succeeding in this Course

- It is **NOT** enough to:
 - Log in once a week and complete the week's content in one sitting or one day.
 - Watch the lectures and copy down the exercises and annotations.
 - Passively read the lecture notes before a test.

Succeeding in this Course

- It is **NOT** enough to:
 - Log in once a week and complete the week's content in one sitting or one day.
 - Watch the lectures and copy down the exercises and annotations.
 - Passively read the lecture notes before a test.
 - Follow worked out examples step-by-step to solve homework problems without understanding the logic.

Succeeding in this Course

- It is **NOT** enough to:
 - Log in once a week and complete the week's content in one sitting or one day.
 - Watch the lectures and copy down the exercises and annotations.
 - Passively read the lecture notes before a test.
 - Follow worked out examples step-by-step to solve homework problems without understanding the logic.
- Some ideas for better strategies:

Succeeding in this Course

- It is **NOT** enough to:
 - Log in once a week and complete the week's content in one sitting or one day.
 - Watch the lectures and copy down the exercises and annotations.
 - Passively read the lecture notes before a test.
 - Follow worked out examples step-by-step to solve homework problems without understanding the logic.
- Some ideas for better strategies:
 - Log in several times throughout the week and complete the material over time, working through the homework well in advance of the due date so any questions that arise can be addressed.

Succeeding in this Course

- It is **NOT** enough to:
 - Log in once a week and complete the week's content in one sitting or one day.
 - Watch the lectures and copy down the exercises and annotations.
 - Passively read the lecture notes before a test.
 - Follow worked out examples step-by-step to solve homework problems without understanding the logic.
- Some ideas for better strategies:
 - Log in several times throughout the week and complete the material over time, working through the homework well in advance of the due date so any questions that arise can be addressed.
 - Actively follow the lectures, including composing your own notes and reviewing the material from the previous lectures. Try to connect ideas from different lectures together.

Succeeding in this Course

- It is **NOT** enough to:
 - Log in once a week and complete the week's content in one sitting or one day.
 - Watch the lectures and copy down the exercises and annotations.
 - Passively read the lecture notes before a test.
 - Follow worked out examples step-by-step to solve homework problems without understanding the logic.
- Some ideas for better strategies:
 - Log in several times throughout the week and complete the material over time, working through the homework well in advance of the due date so any questions that arise can be addressed.
 - Actively follow the lectures, including composing your own notes and reviewing the material from the previous lectures. Try to connect ideas from different lectures together.
 - Work out exercises presented in lectures, and review examples to ensure you are confident in your understanding of them.

Succeeding in this Course

- It is **NOT** enough to:
 - Log in once a week and complete the week's content in one sitting or one day.
 - Watch the lectures and copy down the exercises and annotations.
 - Passively read the lecture notes before a test.
 - Follow worked out examples step-by-step to solve homework problems without understanding the logic.
- Some ideas for better strategies:
 - Log in several times throughout the week and complete the material over time, working through the homework well in advance of the due date so any questions that arise can be addressed.
 - Actively follow the lectures, including composing your own notes and reviewing the material from the previous lectures. Try to connect ideas from different lectures together.
 - Work out exercises presented in lectures, and review examples to ensure you are confident in your understanding of them.
 - Ask questions as soon as possible if experiencing difficulty.

Succeeding in this Course

- It is **NOT** enough to:
 - Log in once a week and complete the week's content in one sitting or one day.
 - Watch the lectures and copy down the exercises and annotations.
 - Passively read the lecture notes before a test.
 - Follow worked out examples step-by-step to solve homework problems without understanding the logic.
- Some ideas for better strategies:
 - Log in several times throughout the week and complete the material over time, working through the homework well in advance of the due date so any questions that arise can be addressed.
 - Actively follow the lectures, including composing your own notes and reviewing the material from the previous lectures. Try to connect ideas from different lectures together.
 - Work out exercises presented in lectures, and review examples to ensure you are confident in your understanding of them.
 - Ask questions as soon as possible if experiencing difficulty.
 - Review your calculus prerequisite (especially integration and optimization).

Succeeding in this Course

Logical Problem Solving and Communicating your Argument:

- Train yourself to always follow a logically consistent argument when solving a math problem. Be clear both to yourself and the grader what you are trying to accomplish and how you are doing it.
- This class is about learning to communicate your argument in writing, as you would in any math class or job in addition to the technical skills presented.
- An answer to an exam question that is incorrect without a clear, logical explanation will almost certainly receive a grade of 0.
- An answer to an exam question that is incorrect but has a clearly reasoned, logical argument associated with it, will receive partial marks (often high marks) as the grader will be able to assess the issue or spot a typo.

Ask questions when you have them!

Ask for help when you need it!

General Terminology

- **Statistics:** “The science of basing inferences on observed data and the entire problem of making decisions in the face of uncertainty” - Freund and Walpole (1987)

General Terminology

- **Statistics:** “The science of basing inferences on observed data and the entire problem of making decisions in the face of uncertainty” - Freund and Walpole (1987)
- **Probability:** A branch of mathematics that deals with modeling uncertainty or randomness.

General Terminology

- **Statistics:** “The science of basing inferences on observed data and the entire problem of making decisions in the face of uncertainty” - Freund and Walpole (1987)
- **Probability:** A branch of mathematics that deals with modeling uncertainty or randomness.
- The first part of this course focuses on probability, which provides the theoretical foundation for statistical inference.

General Terminology

- **Statistics:** “The science of basing inferences on observed data and the entire problem of making decisions in the face of uncertainty” - Freund and Walpole (1987)
- **Probability:** A branch of mathematics that deals with modeling uncertainty or randomness.
- The first part of this course focuses on probability, which provides the theoretical foundation for statistical inference.
- The remainder of the course will be focused on statistics, divided into estimation, hypothesis testing, and linear regression.

General Terminology

- **Statistics:** “The science of basing inferences on observed data and the entire problem of making decisions in the face of uncertainty” - Freund and Walpole (1987)
- **Probability:** A branch of mathematics that deals with modeling uncertainty or randomness.
- The first part of this course focuses on probability, which provides the theoretical foundation for statistical inference.
- The remainder of the course will be focused on statistics, divided into estimation, hypothesis testing, and linear regression.
- The goal of this course is to teach the fundamentals of modeling and interpreting experimental results and other data in the presence of uncertainty or variability.

Statistical Inference

- **Statistical inference** is the practice of learning about a larger **population** from a representative **sample**.

Statistical Inference

- **Statistical inference** is the practice of learning about a larger **population** from a representative **sample**.
- Characteristics of a population (or process) are called **parameters**.

Statistical Inference

- **Statistical inference** is the practice of learning about a larger **population** from a representative **sample**.
- Characteristics of a population (or process) are called **parameters**.
- Characteristics of a sample are called **statistics**, and are often used to estimate population parameters.

Probability and Statistics

The Big Picture: Applying Models in the Real World