

STRING THEORY

S C H O O L O F D E S I G N

STRING THEORY
SCHOOL OF DESIGN

Math 245.C4 Elementary Statistics for Entrepreneurship

Fall 2025

Total Hours: 45

Quarter Credits: 4.5

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Course Description: Understanding the application of data is an essential tool to the success of creative ventures. This course in elementary statistics builds that skill set by having students experiment with such topics as: descriptive measures for empirical data, theory of probability, probability distributions, sampling distributions of statistics from large and small samples, estimation theory, hypothesis testing, correlation, and regression. Students then explicitly connect this knowledge and practice to both case studies in design and entrepreneurship, and to their own design project work.

Prerequisites: Math 145.DeA2 Quantification for Design through Foundations of Mathematics or permission of instructor

IDeATE Program Educational Objectives and Student Learning Outcomes Alignment:

This course is designed to help students achieve the following IDeATE Program Educational Objectives:

- Think critically and creatively
- Apply knowledge to design challenges
- Access future opportunities

Completion of this course will yield the following student IDeATE Program Student Learning Outcomes:

- Construct core knowledge
- Work wicked problems
- Plan strategically

Course Learning Goals: The course is designed around the following learning goals. Upon completion of this course, students should be able to:

- Fluently interpret foundational statistical data.

- Use computational thinking to make sense of probability problems that impact decisions that entrepreneurs make.
- Apply knowledge of statistics to authentic business challenges.

IDeATE Competencies and Mastery Credits:

Competencies	Course Specific Mastery Credits
Inquiry	Patterns: Organizing information (including numerical and visual) to identify patterns and/or relationships to answer a question or solve a problem
Design	Modeling: Representing concepts (abstract situations/information, processes, and systems) with models, visual representations or symbols.
Critical Thinking	Interpreting Data: Interpret data and/or information from sources and draw justifiable conclusions from data
Core Knowledge	Core STEM, Entrepreneurship, and Technology
Collaboration	Global Fluency: Fluently manages knowledge of self, diverse cultures, and interpersonal relationships to increase intercultural adaptability.
Communication	Conventions: Using discipline-appropriate conventions to support clear expression of ideas and information
Engagement	Entrepreneurial Mindset: Grows skills and confidence to identify and make the most of opportunities, overcome and learn from setbacks, and succeed in a variety of settings.

Course Materials:

Required Texts and Materials:

1. *Statistics: Unlocking the Power of Data* by Lock, Lock, Lock, and Morgan
2. *Introduction to Statistics: An Intuitive Guide for Analyzing Data and Unlocking Discoveries* by Jim Frost

Suggested Resources:

1. "The Questions Every Entrepreneur Must Answer" by. A. Bhidé, Harvard Business Review, November/December 1996, pp. 120-130 (reprint 96603). (["The Questions Every Entrepreneur Must Answer"](#))
2. *How to Come Up with a Business Idea* by Catherine Cote
<https://online.hbs.edu/blog/post/how-to-come-up-with-a-business-idea>

Mastery Grading System:

3.8 - 4.0 Exceeds Mastery	3.0 - 3.7 Mastery	2.0 - 2.9 Developing	1.0 - 1.9 Insufficient Evidence
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Whole number mastery grades (1 - 4) are recorded for each mastery credit aligned to each product, performance, or assessment, with points used to compute a synthesized mastery course grade for each student at the end of each quarter. Students must earn a mastery course grade of 2.0 or higher to receive credit for a course and evidence readiness for any future learning for which this course serves as a prerequisite in the IDEATE program.

Course Schedule (subject to change, with notice):

Week #	Topics/Experiences	Content	Products/Performances/ Assessments
Week 1	EQ: How does statistical analysis impact decisions entrepreneurs make? Collecting Data	<i>Statistics: Unlocking the Power of Data</i> Chapter 1 “The Questions Every Entrepreneur Must Answer” by A. Bhidé	Chapter Quiz 1 Socratic Seminar 1: Essential Question
Week 2	Describing Data	<i>Statistics: Unlocking the Power of Data</i> Chapter 2 <i>How to Come Up with a Business Idea</i> by Catherine Cote	Chapter Quiz 2 Entrepreneurship Data Story Project Proposal
Week 3	Confidence Intervals	<i>Statistics: Unlocking the Power of Data</i> Chapter 3 Excerpt <i>Intuitive Guide</i>	Chapter Quiz 3 Entrepreneurship Data Story Project Research
Week 4	Hypothesis Tests	<i>Statistics: Unlocking the Power of Data</i> Chapter 4 Excerpt <i>Intuitive Guide</i>	Chapter Quiz 4 Entrepreneurship Data Story Project Data Collection
Week 5	Approximating with a Distribution	<i>Statistics: Unlocking the Power of Data</i> Chapter 5 Excerpt <i>Intuitive Guide</i>	Chapter Quiz 5 Entrepreneurship Data Story Project Data Modeling
Week 6	Inference for Means and Proportions	<i>Statistics: Unlocking the Power of Data</i> Chapter 6 Excerpt <i>Intuitive Guide</i>	Chapter Quiz 6 Entrepreneurship Data Story Project Presentation Draft 1
Week 7	Chi Square Tests for Categorical Variables	<i>Statistics: Unlocking the Power of Data</i> Chapter 7 Excerpt <i>Intuitive Guide</i>	Chapter Quiz 7 Entrepreneurship Data Story Project Presentation Draft 2
Week 8	ANOVA to Compare Means	<i>Statistics: Unlocking the Power of Data</i> Chapter 8 Excerpt <i>Intuitive Guide</i>	Chapter Quiz 8 Entrepreneurship Data Story Presentation Rehearsal and Peer Critique
Week 9	Inference for Regression	<i>Statistics: Unlocking the Power of Data</i> Chapter 9	Chapter Quiz 9 Entrepreneurship Data Story Final Presentations
Week 10	Multiple Regression EQ: How does statistical analysis impact decisions entrepreneurs make?	<i>Statistics: Unlocking the Power of Data</i> Chapter 10	Chapter Quiz 10 Socratic Seminar 2: Essential Question

Submission Dates:

SUBMISSION DATE	PRODUCT/PERFORMANCE/ASSESSMENT DUE
weekly on Fridays	Chapter quizzes
Wednesday, Sep 10, 2025	Socratic Seminar 1
Wednesday, Sep 17, 2025	Entrepreneurship Data Story Project Proposal
Wednesday, Sep 24, 2025	Entrepreneurship Data Story Project Research
Wednesday, Oct 1, 2025	Entrepreneurship Data Story Project Data Collection
Wednesday, Oct 8, 2025	Entrepreneurship Data Story Project Data Modeling
Wednesday, Oct 15, 2025	Entrepreneurship Data Story Project Draft 1
Wednesday, Oct 22, 2025	Entrepreneurship Data Story Project Draft 2
Wednesday, Oct 29, 2025	Entrepreneurship Data Story Project Rehearsal/Critique
Wednesday, Nov 5, 2025	Entrepreneurship Data Story Project Final Presentation
Wednesday, Nov 12, 2025	Socratic Seminar 2
Wednesday, Nov 19, 2025	Narrative Self-Reflection

IDeATE PROGRAM POLICIES:

Academic Integrity: IDeATE students and professors uphold academic integrity as one of our highest priorities, and the String Theory School of Design investigates any allegation of violations of academic integrity. Violations include, but are not limited to: plagiarism, cheating, fabrication, and other forms of academic misconduct. Students who believe they have been wrongly accused or sanctioned have a right to an appeals process.

Attendance Requirements:

Students are expected to attend all classes, and must notify professors if they are not able to attend class for any reason. It is the student's responsibility to inquire about experiences, content, and work missed due to that absence. For further information on the attendance policy, please consult the IDeATE Program catalog.

Course Change Policy: IDeATE program faculty reserve the right to make changes to the course during the quarter to best actualize course learning goals. Changes will be announced to individual classes and conveyed in writing in advance of the change.

Accessibility and Disability Accommodations: Students with disabilities requesting accommodations and services need to complete an Accessibility Form, along with documentation from a licensed medical professional with a diagnosis of disability (defined as an impairment and/or condition that substantially limits a major life activity for 6+ months). Temporary adjustments are available for individuals with short-term impairments, i.e., those due to accident or injury. Please see the String Theory School of Design IDeATE Program course catalog for more details.

Course Drops and Withdrawals: Enrolled students may drop a course through the end of Week 1, and may withdraw from a course through Week 7. Please be aware of the potential financial and academic implications of course drops and withdrawals. Please see the String Theory School of Design course catalog for more details. Once registered, it is your obligation to attend, drop, or withdraw. Dropping will remove the course from your transcript. Withdrawing will result in a "W" on a student's transcript.

Commitment to Inclusive Practices: The String Theory School of Design welcomes individuals from diverse backgrounds and perspectives, and promotes an inclusive and respectful environment that enriches the school community and the educational and employment experience of its members. To report an incident, sexual misconduct, discrimination or harassment based on race, color, national origin,

religion, sex, sexual orientation, disability, gender identity or expression, age, veteran status, or any other protected category or identity, please follow current guidance in the String Theory School of Design IDEATE Program course catalog.

Welcome, School of Design Students!

I'm excited to have you in *Elementary Statistics for Entrepreneurship*. I know "statistics" might sound dry or intimidating, but this course is all about making it hands-on, practical, and actually useful for the kind of real-world problems entrepreneurs face.

This class will be project-based, which means you will be applying concepts through creative projects. We'll use Fusion 360 to build product models, and we'll use Python to analyze data and create statistical models around design elements such as cost analysis, market simulations, and quality control, to name a few.

By the end of this course, you'll not only understand core statistical ideas, but you'll also have real skills in tools used by modern startups and creators. No prior coding or CAD experience is required, we'll learn together as we go. Looking forward to building, analyzing, and creating with you this semester! Below are some course expectations designed to help you understand what to expect.

All the best,
-Rob Snyder

Course Expectations for Elementary Statistics for Entrepreneurship:

To help you succeed and get the most out of this experience, here are some expectations specific to our class:

1. Active Participation in Project-Based Learning

- This course is centered around hands-on projects, so your consistent engagement is key.
- You'll be expected to collaborate with peers, share ideas, and participate in class discussions and design reviews.
- Mistakes are a part of the game. Do not worry about being perfect. Curiosity, problem solving, and trying things out matter more.

2. Weekly Chapter Quizzes

- Quizzes will be given weekly based on the core statistical concepts in each chapter of our book *Statistics: Unlocking the Power of Data*

3. Final Presentation

- Your final project will be a **Data Story**, a visual and statistical narrative where you present the data that supports your product design
- You'll combine your CAD design, statistical modeling, and entrepreneurial thinking into a presentation to share with the class
- This will include design visuals, data insights, and your business decision-making process.

4. No prior CAD or Coding Experience Needed

- We'll start with the basics of both **Fusion 360** and **Python**.
- You're expected to ask questions, explore tutorials, and make an honest effort to build your skills week by week.

5. Real-World Application of Statistics

- Expect to use statistical methods like descriptive analysis, regression, probability, and hypothesis testing to evaluate business-related scenarios.

6. Respect for Deadlines and Teamwork

- Many assignments will be group-based. Meeting deadlines and communicating clearly with your team is essential.
- Your individual accountability is just as important as collaboration

7. Software and Tools

- You'll need access to **Fusion 360** (via laptop) and **Python** (through Jupyter Notebooks)

8. Books

- *Statistics: Unlocking the Power of Data* by Lock, Lock, Lock, and Morgan
- *Introduction to Statistics: An Intuitive Guide for Analyzing Data and Unlocking Discoveries* by Jim Frost

We'll walk through how to get set up in the first week. Prepare to do your best!

