AI TUTOR-ENABLED SELF-PACED PROFESSIONAL COURSE BOOK

Statistics for Data Analysis

Turn data into conclusions you can explain and defend.

NoteStore Academy

Level: Beginner → Intermediate | Estimated study time: 35 hours

Statistics for Data Analysis

AI Tutor-Enabled Self-Paced Professional Course Book

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How to use this course book

Statistics for Data Analysis is a self-paced course book covering descriptive statistics, probability, sampling, confidence intervals, hypothesis tests, ANOVA and regression. Each idea is linked to a practical question, so you learn which method to choose and how to explain the result.

A simple study routine

- Study one module at a time. Read the overview and objectives first.
- Work through each key concept, using the TEACH ME prompt whenever an idea is unclear.
- Attempt every practice problem yourself before asking for help.
- Use CHECK MY WORK to review your solutions and CHALLENGE ME to test yourself.
- Finish each module by writing a five-line summary in your own words.

Suggested pace

Most learners complete this course in about 35 hours. Studying four to five hours a week, that is roughly 8 to 10 weeks. Go faster through topics you already know and slower where you need more practice.

Your AI Tutor: five learning modes

This course book is designed to be used with an AI assistant such as ChatGPT, Microsoft Copilot or Gemini. The goal is not to get answers from AI, but to use it as a patient tutor that explains, guides, checks and challenges you. Copy a prompt, replace the text in brackets and keep the conversation going.

TEACH ME

Explain [topic from this module] to me step by step at a [beginner / intermediate / advanced] level. Use a simple example first, then a harder one. Stop and ask me a question to check I understood before moving on.

GUIDE ME

I am working on this problem: [paste problem]. Do not give me the answer. Give me one hint at a time and wait for my next step.

CHECK MY WORK

Here is my solution: [paste working]. Check each step, tell me exactly where any mistake is and why, but let me correct it myself.

CHALLENGE ME

Give me three exam-style questions on [topic from this module], getting harder each time. Wait for my answers, then mark them and explain what I missed.

HELP ME APPLY IT

Show me how [topic from this module] is used in a real situation such as work, research or everyday decisions, then give me a small task to try it myself.

Verify before you trust

AI tools can make mistakes, especially with calculations. Use this five-step check every time:

- ASK: write a clear, specific prompt that includes your level and what you have tried.
- SOLVE: work the problem yourself first, even if you are unsure.
- TEST: substitute values, estimate or graph to see if the answer is reasonable.
- CHECK: compare with the worked examples in this book and your class notes.
- VALIDATE: if the AI and the book disagree, trust the book and your teacher, and ask the AI to explain the difference.

MODULE 1

Data and Variables

Understand the types of data you will analyse.

Learning objectives

- Explain types of variables in your own words and recognise when it applies.
- Explain sampling and study design in your own words and recognise when it applies.
- Solve problems involving data quality accurately.

Key concepts

Types of variables

Write a one-sentence definition in your own words, then work one example by hand. Use the prompt below if any step is unclear.

> TEACH ME: Explain types of variables in Statistics for Data Analysis step by step at my level. Start with a simple example, then a harder one, and ask me a question to check my understanding.

Sampling and study design

Find where this appears in your class notes or textbook. Note the key formula or rule, one worked example and one mistake students often make.

> TEACH ME: Explain sampling and study design in Statistics for Data Analysis step by step at my level. Start with a simple example, then a harder one, and ask me a question to check my understanding.

Data quality

Explain this idea out loud as if teaching a friend. Where you hesitate, ask your AI Tutor for a simpler explanation and a second example.

> TEACH ME: Explain data quality in Statistics for Data Analysis step by step at my level. Start with a simple example, then a harder one, and ask me a question to check my understanding.

Practice problems

1. Classify ten variables by type
2. Spot the bias in a survey design

After attempting each problem, paste your working into the CHECK MY WORK prompt. Then use CHALLENGE ME to get three more problems on the same topic.

Before moving on: write a five-line summary of this module in your own words, then ask your AI Tutor to point out anything you missed.

Continue in the full course book

The full course book continues with:

- Module 2: Descriptive Statistics
- Module 3: Data Visualisation
- Module 4: Probability Basics
- Module 5: Probability Distributions
- Module 6: Sampling Distributions
- Module 7: Confidence Intervals
- Module 8: Hypothesis Testing
- Module 9: Comparing Groups
- Module 10: Correlation and Regression
- Four practical projects and a capstone
- Portfolio guide, assessment rubric and completion checklist