

2022 Advanced Placement® Statistics

About the AP® Statistics Summer Institute

This session is designed for new and experienced teachers and will cover the material pertinent to the 2022-2023 AP® Statistics Course.

Learning Objectives

- Deepen understanding of statistical concepts and methods, as well as the four-course skills, described in the AP Statistics Course and Exam Description (CED)
- Refine course planning to meet students' needs given available constraints, resources, and supports.
- Examine effective instructional strategies and assessment resources for AP Statistics.
- Explore uses of AP Classroom to assess and provide feedback about student learning and aid you in designing instruction.
- Expand professional network as part of the AP Community.

Tentative Agenda:

Day 1: July 11, 2022

Session 1

- Introductions
- AP Statistics Overview
- College Board Resources (AP Central, AP Classroom, CED)
- Other AP Statistics Resources
- Use of Technology, Formulas, and Tables
- AP Audit, Pacing/Syllabi
- Equity and Access as a Guiding Principle in Designing Instruction

Session 2

- CED Unit 1, Exploring One-Variable Data
- Descriptive Statistics in Words, Numbers, and Charts/Graphs
- Normal Distributions
- Problem Sets on Exploring One-Variable Data
- Exploring One-Variable Data Activity (Census at School)

Session 3

- CED Unit 2, Exploring Two-Variable Data
- Scatterplots and Association
- Correlation and Coefficient of Determination
- Least-Squares Regression Lines
- Residual Plots

Session 4

- Problem Sets on Exploring Two-Variable Data

- Correlation and Regression Methods Activity (Bundesliga Soccer Data)
- In-Class Exercises on Exploring Data and Relationships

Day 2: July 12, 2022

Session 1

- CED Unit 3, Collecting Data
- Sampling
- Observational Studies
- Experiments
- Designing Studies
- Scope of Inference
- Simulation and Simulation-Based Inference

Session 2

- Problem Sets on Collecting Data
- Sampling Activity (Sampling at a School Assembly)
- Experimental Design Activity

Session 3

- CED Unit 4, Probability, Random Variables, and Probability Distributions
- Randomness and Probability Rules
- Conditional Probability
- Mutually Exclusive Events and Independent Events
- Random Variables (Discrete and Continuous)
- Binomial and Geometric Distributions
- Combined Event Probabilities

Session 4

- Problem Sets on Probability, Random Variables, and Probability Distributions
- Probability Activity (Rock-Paper-Scissors)
- Probability Activity (Casino Lab)

Day 3: July 13, 2022

Session 1

- CED Unit 5, Sampling Distributions
- Sample Proportion
- Sampling Distribution of a Sample Proportion
- Sample Mean
- Sampling Distribution of a Sample Mean

Session 2

- Problem Sets on Sampling Distributions
- Sampling Distributions Activity (Reese's Pieces)
- Sampling Distributions Follow-Up Activity (Reese's Pieces)

Session 3

- CED Unit 6, Inference for Categorical Data: Proportions
- Confidence Interval for a Proportion
- Conditions for Inference
- Margin of Error and Standard Error
- Significance Tests About a Proportion

- Test Statistics and P-Values
- Power, Type I, and Type II Errors
- 2-Proportion Confidence Intervals and Significance Tests for Proportions

Session 4

- Problem Sets on 1-Sample and 2-Sample Inference Procedures for Proportions
- Confidence Interval Activity (Presidential Polls)
- Significance Test Activity (Hershey's Kisses)

Day 4: July 14, 2022

Session 1

- CED Unit 7, Inference for Quantitative Data: Means
- Confidence Interval for a Mean
- T-Distributions and Degrees of Freedom
- Significance Tests About a Mean
- 2-Proportion Confidence Intervals and Significance Tests for Means
- Problem Sets on 1-Sample and 2-Sample Inference Procedures for Means
- Confidence Interval and Significance Test Activity for Means (Cereal Box Vouchers)

Session 2

- CED Unit 8, Inference for Categorical Data: Slopes
- Chi-Square Distributions
- Conditions for Inference
- Chi-Square Goodness of Fit Test
- Chi-Square Test for Association/Independence
- Chi-Square Test for Homogeneity
- Problem Sets on Chi-Square
- Chi-Square Goodness of Fit Activity (M&M's)
- Strategies and Pedagogical Tools

Session 3

- CED Unit 9, Inference for Quantitative Data: Slopes
- Confidence Interval for Regression Slope
- Significance Test for Regression Slope
- Conditions for Inference
- Review Sample Chapter Tests (1-12)

Session 4

- Instructional Planning Reports PP Slide Deck
- AP Classroom PP Slide Deck (revisited)
- Sample Investigative Task
- Cumulative Review Practice (Exploring Data, Collecting Data, Probability, Inference)
- AP Reading
- Common Student Errors
- Assessment Strategies
- AP Exam Review Tips
- Projects in AP Statistics
- Equity and Access as a Guiding Principle in Designing Instruction (revisited)
- Wrap-up

What to bring:

Items you should bring during the week include:

- a laptop computer & storage device
- a TI-84 Plus graphing calculator
- a current syllabus and pacing guide
- one classroom activity to share
- one best practice to share
- comfortable clothes and shoes for walking in the summer heat
- a light sweatshirt or sweater in case you get chilly in the AC
- note: a survey will be sent to you a few weeks before the course begins – please be sure to provide your own email address so that you can respond before the beginning of the workshop

Instructor:

David Wilcox is a current member of the mathematics faculty at The Lawrenceville School in Lawrenceville, NJ, and was awarded the Eileen Mullady Distinguished Teaching Chair in 2021. In his second year at The Lawrenceville School, he received the Robert B Ritter Jr award from the Head of School for excellence in academic nurturing. David has served as a rubric team member, table leader, and reader for the College Board at the AP Statistics Reading for the past 20 years. He is also an APSI and workshop instructor for the College Board and has been a presenter at the AP Annual Conference. David's consulting work includes recent projects with ETS and Edgenuity, and he serves as a "What's Going on in this Graph" moderator for The New York Times. In addition to AP Statistics, he teaches Honors Calculus-Based Probability and Statistics and develops a probability and statistics curriculum for integrated math courses at The Lawrenceville School. David received a

Bachelor of Science in Mathematics from Christian Brothers University in 1989, a Masters of International Business Studies (Spanish Track) from the University of South Carolina in 1994, and a Masters of Applied Statistics from the University of South Carolina in 2013.