CourseKata

A Modern Approach to High School Statistics and Data Science

CourseKata Statistics and Data Science is an innovative interactive online textbook for teaching introductory statistics and data science in colleges, universities, and high schools. Part of CourseKata's *Better Book Project*, we are leveraging research and student data to guide continuous improvement of online learning resources. *CourseKata Statistics and Data Science* is completely free for you and your students.

By 12th grade, a large proportion of students do not take mathematics. These students appear to have closed off opportunities for STEM-related careers. In this project we are developing, testing, and curriculum materials to meet the needs of these students. Our ambitious goal is to re-engage them in math and produce transferable knowledge that could open up new career pathways. And, across the country an increasing number of innovative districts and schools are redesigning their math pathways to include a parallel path towards data science, and even alternatives to traditional Algebra II or Integrated Math 3. *CourseKata Statistics and Data Science* can be an anchor in that process.

Highly Interactive Student Experience

CourseKata's online textbook includes more than 1200 formative assessment questions, engaging students in active learning throughout. Students learn to program and analyze data using R, a standard open-source programming language for data science. R exercises are interleaved throughout the online book, giving students opportunities to continually practice applying the concepts they are learning.

Richly Informative Teacher Tools

Teacher interface gives real-time access to students' thinking and progress through the book. CourseKata's seamless integration of Jupyter Notebooks provides a means of structuring in-class activities, sharing new data sets, and managing authentic assessments and student projects.
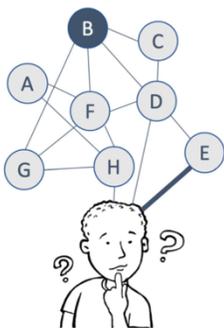
The *Practicing Connections* Approach

CourseKata's online book is based on the ***practicing connections hypothesis:*** Students continually practice making connections between core concepts, representations, and the world of data analysis. These connections result in deep understanding and transferable knowledge.

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Statistical Modeling at the Core

CourseKata's online book is organized around the concept of statistical modeling and the practice of data analysis: exploring variation, modeling variation, and evaluating models.

Evaluate Models — Explore Variation — Model Variation
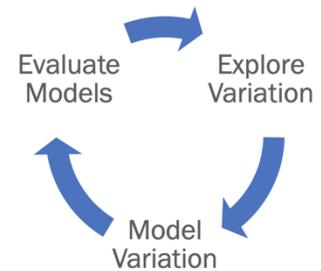
An Online Textbook Suitable for Live or Remote Instruction

CourseKata Statistics and Data Science can replace your current introductory textbook. It is best used in a blended learning situation in which students work through the textbook for homework and convene with their teacher - either face-to-face or virtually - to discuss key concepts and new data analysis examples.

Articulation

CourseKata Statistics and Data Science is being utilized in multiple ways, including as a 12th grade math course, an alternative to Math 3 or Algebra II, or simply a more engaging way to teach a traditional statistics course.

A Growing Library of In-Class Materials

In addition to the online textbook, CourseKata has a growing library of resources such as syllabi and assessments shared by other instructors, and Jupyter notebooks with data analysis activities that can be conducted in class. CourseKata's cloud-hosted JupyterHub server is fully integrated with the online textbook, with tools instructors can use to easily distribute, collect back, and grade notebooks from students.

Professional Development & Support

CourseKata provides extensive professional development before the course begins. Throughout the year, the team provides frequent study groups and weekly Zoom "office hours" for instructors, researchers, and designers to collaborate to make teaching the course as seamless as possible. These sessions also provide valuable insights about how to continuously improve the online book and approach.

Check out the course at https://coursekata.org/
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