



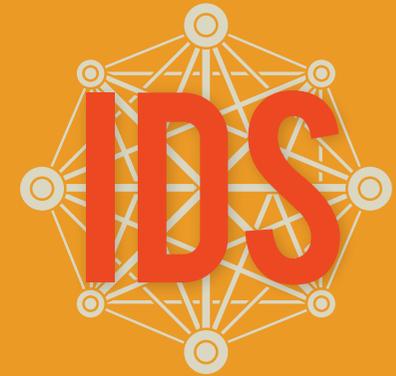
## WHO IS INTRODUCTION TO DATA SCIENCE FOR?

IDS is a “C” approved mathematics course in the University of California A-G requirements. As a statistics course, successful completion of IDS validates Algebra II. IDS is an excellent option for any secondary school student who possesses sufficient mathematical maturity and quantitative reasoning ability, and has successfully completed a first-year course in algebra. The best time to take IDS is after finishing the first-year algebra and geometry requirements.

IDS is a rigorous course. It is for students who wish to:

- » Develop their quantitative skills.
- » Take a course that will prepare them for AP Statistics.
- » Take an alternative high school mathematics pathway.
- » Gain access to emerging fields that include Computational Data Analysis.
- » Be engaged with math, statistics, and computational thinking when the instruction is inquiry-based in real world issues.

In partnership with...



## Introduction to Data Science

## WHY DO WE NEED INTRODUCTION TO DATA SCIENCE (IDS)?

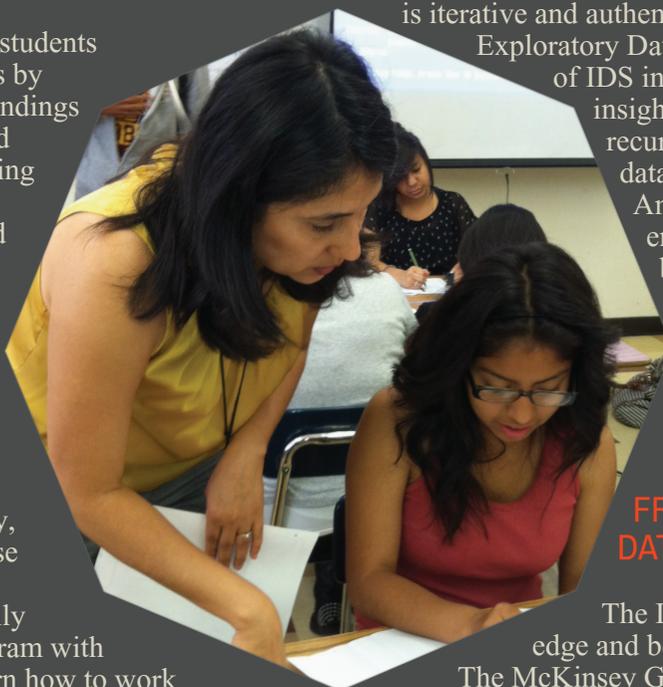
IDS teaches all students to think critically about and with data.

It is crucial to update high school statistics courses to make them more relevant to today's data-driven world. A dynamic, computation-based statistics and probability course better prepares students for college and the job force. It also prepares them with quantitative critical thinking skills, making them more informed participants in our modern democracy.

IDS immediately engages students with real data, introducing statistical, computational, and graphical tools for reasoning about the world.

## WHAT IS UNIQUE ABOUT INTRODUCTION TO DATA SCIENCE?

Through IDS lessons, students function as researchers by making truly unique findings about the world around them. Through collecting their own data using hand-held devices, and by examining data from formal sources, students learn to generate hypotheses, fit statistical and mathematical models to data, implement these models algorithmically, evaluate how well these models fit reality, and to think computationally while learning to program with data. IDS students learn how to work with Participatory Sensing (collecting data



through their smart phones) and R, an open-source programming language that has long been the standard for academic statisticians and analysts in industry. Through R, implemented through the RStudio interface, students learn to code and to compute with data to develop graphical and numerical summaries to both communicate findings and to generate further exploration.

## WHAT IS THE INSTRUCTIONAL PHILOSOPHY OF INTRODUCTION TO DATA SCIENCE?

The main goal of the IDS curriculum is to teach students to think critically about and with data. The Common Core State Standards (CCSS) for High School Statistics and Probability relevant to data science are taught along with the data demands of good citizenship in the 21st century. IDS learning is iterative and authentically inquiry-based.

Exploratory Data Analysis is the cornerstone of IDS instruction, which allows insights to be gleaned through a recursive process of examining data for trends. Exploratory Data Analysis allows students to engage with data immediately by generating plots to develop a natural sense of the data's structure, before moving on to more rigorous analysis.

## WHO WILL BENEFIT FROM INTRODUCTION TO DATA SCIENCE?

The IDS curriculum is cutting-edge and beneficial to all students. The McKinsey Global Initiative Report on Big Data says it best: "Data have become a torrent

flowing into every area of the global economy."

All students need to learn to work with this torrent or they will be swept away. Most importantly, IDS provides access to rigorous learning that fuses mathematics with computer science and specifically supports learning for women and minorities – groups that have been a) traditionally underrepresented in the field, and b) shown to particularly benefit from interactive mathematics and science curricula. IDS also provides access for English Learners by focusing on an inquiry-based instructional approach.



## WHAT WILL STUDENTS DO IN INTRODUCTION TO DATA SCIENCE?

Students engage in a myriad of relevant and authentic assignments. These include:

- » Computer-based Labs and Practicums using RStudio
- » Oral Presentations
- » Design Projects
- » Participatory Sensing Campaigns
- » Participatory Sensing Written Topic Report
- » End-of-Unit Reports
- » Evaluation of Reports Based on Data

Students learn through engagement in collaborative learning, problem solving, modeling, abstraction, and critical thinking.