

***Proposed course sequence designed for  
Community College, High School, Adult Continuing Education***

## **Data Science Fundamentals I & II**

The US Department of Labor reports a huge and growing demand for job opportunities in Data Science and related fields.

Up until recently, degrees related to Data Science have been at the graduate level, with most being master's level professional degrees. Recently, universities have started to add bachelor's level "concentrations" to existing degrees such as Computer Science, Information Technology, Business, etc. These courses invariably start at the upper division bachelor's level (junior and senior).

Currently there is a huge void for a Data Science Fundamentals course sequence below upper division bachelor's level.

To help fill this void, I'm currently developing a free curriculum for a two semester Data Science Fundamentals I & II course sequence specifically designed to be taught at the community college, high school (regular or dual credit), and/or adult continuing education level.

This course sequence will use an intuitive approach to cover at a high level all major concepts of Data Science. The classroom work will be a heavily hands-on using GUI based tools (no programming language required). This makes the course sequence accessible to anyone with a knowledge of high school algebra.

The curriculum will be named:

***Data Science – An Intuitive, Hands-on Approach for a First Course***

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I'm currently a Data Science Lecturer at the University of California, Berkeley, teaching half-time in the online Master's of Data Science program. I have also taught part-time at the University of Texas at Dallas in the Master's program, and part-time at several community colleges, including dual credit high school students. I also have years of industry consulting experience in the areas of Data Science.

# Data Science Fundamentals I & II

## Proposed Curriculum Details

### Prerequisites:

Required: High School Algebra or Statistics

### Topics:

**Introduction:** Overview, Application Areas, Career Opportunities.

**Technologies:** Exploratory Data Analysis, Data Wrangling, Data Munging, Data Cleansing, Data and Sampling Distributions, Statistical Experiments and Significance Testing, Data Visualization, Data Mining, Machine Learning, Natural Language Processing, Deep Learning, Neural Networks, Cognitive Technology, Big Data Analytics.

**Applications:** Predictive Analytics, Classification, Clustering, Content-Based Recommendations, Market Basket Analytics, Recommendation Engine, Social Media Analytics, Network / Relationship Analytics, Sentiment Analytics, Healthcare Analytics, Handwriting Recognition, Image Recognition, Cyber Security (Network Traffic Analytics), Financial Risk (Monte Carlo Simulation).

### Curriculum:

- **Two Semester Sequence** - would be best.
- **Intuitive, Hands-on** – classroom work will use an intuitive approach and be heavily hands-on.
- **Textbook**
  - ***Data Science - an Intuitive, Hands-on Approach for a First Course***  
(a free electronic copy of the textbook will be provided in PDF format).
- **Slides and Videos** – will be provided free for the textbook material.
- **Lab Assignments** - will be provided free. These could be assigned as homework, or could be used for a required face-to-face lab time.
- **Face-to-face, Online, or Hybrid** – although face-to-face is best, since slides and videos are provided for the textbook, it could be taught as an online course or as a hybrid course.
- **No Computer Programming Language Required**
  - **Orange Software** - <https://orange.biolab.si/> - a free, popular, easy to use, GUI based, software tool that is perfect for learning data science fundamentals. No computer programming language is required.