

Proposed Course

Data Science for Non-Majors

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

In addition, Data Science is starting to play a secondary role in a lot of other fields. Employers are starting to value and seek out those with knowledge of Data Science in addition to knowledge and experience in their own field.

Students are aware of this, and in light of the current highly competitive new college hire job market, students from all types of majors are actively seeking out courses in Data Science.

Current courses in Data Science at most universities expect an advanced knowledge of Calculus-based Statistics and an intermediate to advanced skill level in Computer Programming including Algorithms and Data Structures. These prerequisites make them inaccessible to most majors outside of Computer Science, Engineering, and Mathematics.

Currently there is a huge demand met with a huge void for a Data Science Concepts for Non-Majors course at most universities.

To help fill this void, I'm currently developing a free curriculum that will 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 basic, high school level, Algebra-based Statistics.

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.

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Proposed Curriculum Details

Prerequisites:

Required: knowledge of basic, high school level, Algebra-based 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:

- **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.