Minor in Data Science
Advising Guide

Requirements
In order to earn a minor in data science, students must complete 30 credits, including:

- Programming, choose one of the following four courses (4-5 credits):
  - CPSC 1220 - Data-driven Problem Solving and Programming
  - CPSC 1420 - Programming and Problem Solving I
  - ECEGR 2000 - Physical Computing with Python
  - MEGR 2810 - Engineering Methods

- Statistics, choose one of the following nine courses (5 credits):
  - CRJS 3020 - Criminal Justice Statistics
  - ECON 2100 - Business Statistics
  - EVST 3400 - Research Design and Statistics
  - MATH 1210 - Statistics for Life Sciences
  - MATH 2310 - Probability & Statistics for the Sciences and Engineering
  - MATH 3412 - Mathematical Statistics
  - PSYC 3050 - Statistics and Research Methods II
  - PUBA 4400 - Research Design and Statistics
  - SOCW 4010 - Social Work Data Analysis

- Databases, choose one of the following two courses (5 credits):
  - CPSC 2300 - Introduction to Databases
  - CPSC 3300 - Fundamentals of Databases

- Data visualization, choose one of the following two courses (5 credits):
  - BUAN 3210 - Data Visualization and Communication
  - DATA 3310 - Data Visualization

- Methodology and Applications of Data Science: Take this DATA course (5 credits)
  - DATA 3320 - Methodology and Applications of Data Science

- Data Science electives, choose remaining credits from the following courses:
  - BUAN 4310 - Data Mining and Big Data Analytics
  - CHEM 3000 - Quantitative Analysis
  - CPSC 4310 - Machine Learning
  - CPSC 4330 - Big Data Analytics
  - CPSC 4610 - Artificial Intelligence
  - ECEGR 4620 - Data Communication Networks
  - ECEGR 4640 - Internet of Things
  - ECEGR 4720 - Introduction to Digital Image Processing
- ECEGR 4750 - Machine Learning I
- ECEGR 4760 - Machine Learning II
- ECON 3100 - Quantitative Methods and Applications
- ECON 4110 - Applied Econometrics
- ECON 4120 - Forecasting Business Conditions
- ENSC 2400 - Environmental Sensors
- ENSC/EVST 3500 - Intro to Geographic Information Systems
- MATH 3411 - Probability
- MATH 3450 - Introduction to Numerical Methods
- MEGR 4910 - Design Optimization
- PHYS 3910 - Computational Physics
- PSYC 4030 - Advanced Statistics and Experimental Design

While students’ progress through the minor will vary depending on the specific choices made and their major requirements, we expect the following structure to be representative of most students’ paths:

Specifically, DATA 3320 requires the completion of the programming, statistics, databases, and data visualization requirements. DATA 3310, which most students will take for their data visualization requirement, requires completion of the programming and statistics requirements. And CPSC 2300, which most students will take for their databases requirement, requires completion of the programming requirement. The elective options will vary on what their requirements are, as these are determined by each department / program offering these courses.

CPSC 2300 and DATA 3310 will be offered every winter quarter. DATA 3320 will be offered every spring quarter.
While MATH 1210 is primarily targeted towards life sciences (including biology and sport & exercise science), it covers standard introductory statistics material, and could be a good option for students from any major for the statistics requirement for the minor.

As a guide, here are potential course combinations for some majors:

**Math:**
- CPSC 1220 - Data-driven Problem Solving and Programming
- MATH 3412 - Mathematical Statistics
- CPSC 2300 - Introduction to Databases
- DATA 3310 - Data Visualization
- DATA 3320 – Methodology and Applications of Data Science
- MATH 3411 - Probability

**Computer Science:**
- CPSC 1420 - Programming and Problem Solving I
- MATH 2310 - Probability & Statistics for the Sciences and Engineering
- CPSC 3300 - Fundamentals of Databases
- DATA 3310 - Data Visualization
- DATA 3320 – Methodology and Applications of Data Science
  - One of
    - CPSC 4310 - Machine Learning
    - CPSC 4330 - Big Data Analytics
    - CPSC 4610 - Artificial Intelligence

**Psychology:**
- CPSC 1220 - Data-driven Problem Solving and Programming
- PSYC 3050 - Statistics and Research Methods II
- CPSC 2300 - Introduction to Databases
- DATA 3310 - Data Visualization
- DATA 3320 – Methodology and Applications of Data Science
- PSYC 4030 - Advanced Statistics and Experimental Design

**Business:**
- CPSC 1220 - Data-driven Problem Solving and Programming
- ECON 2100 - Business Statistics
- CPSC 2300 - Introduction to Databases
- DATA 3310 - Data Visualization
- DATA 3320 – Methodology and Applications of Data Science
- ECON 3100 - Quantitative Methods and Applications

**Business Analytics:**
- CPSC 1220 - Data-driven Problem Solving and Programming
- ECON 2100 - Business Statistics
- CPSC 2300 - Introduction to Databases
- BUAN 3210 - Data Visualization and Communication
- DATA 3320 – Methodology and Applications of Data Science
- BUAN 4310 - Data Mining and Big Data Analytics

**Electrical and Computer Engineering:**
- ECEGR 2000 - Physical Computing with Python
- MATH 2310 - Probability & Statistics for the Sciences and Engineering
- CPSC 2300 - Introduction to Databases
- DATA 3310 - Data Visualization
- DATA 3320 – Methodology and Applications of Data Science
- Any two of
  - ECEGR 4620 - Data Communication Networks
  - ECEGR 4640 - Internet of Things
  - ECEGR 4720 - Introduction to Digital Image Processing
  - ECEGR 4750 - Machine Learning I
  - ECEGR 4760 - Machine Learning II

**Environmental Science:**
- CPSC 1220 - Data-driven Problem Solving and Programming
- MATH 1210 - Statistics for Life Sciences
- CPSC 2300 - Introduction to Databases
- DATA 3310 - Data Visualization
- DATA 3320 – Methodology and Applications of Data Science
- ENSC/EVST 3300 - Intro to Geographic Information Systems

Any questions about this minor can be directed to McLean Slaughter in the Mathematics Department: sloughtj@seattleu.edu