BS in Applied and Computational Math Program
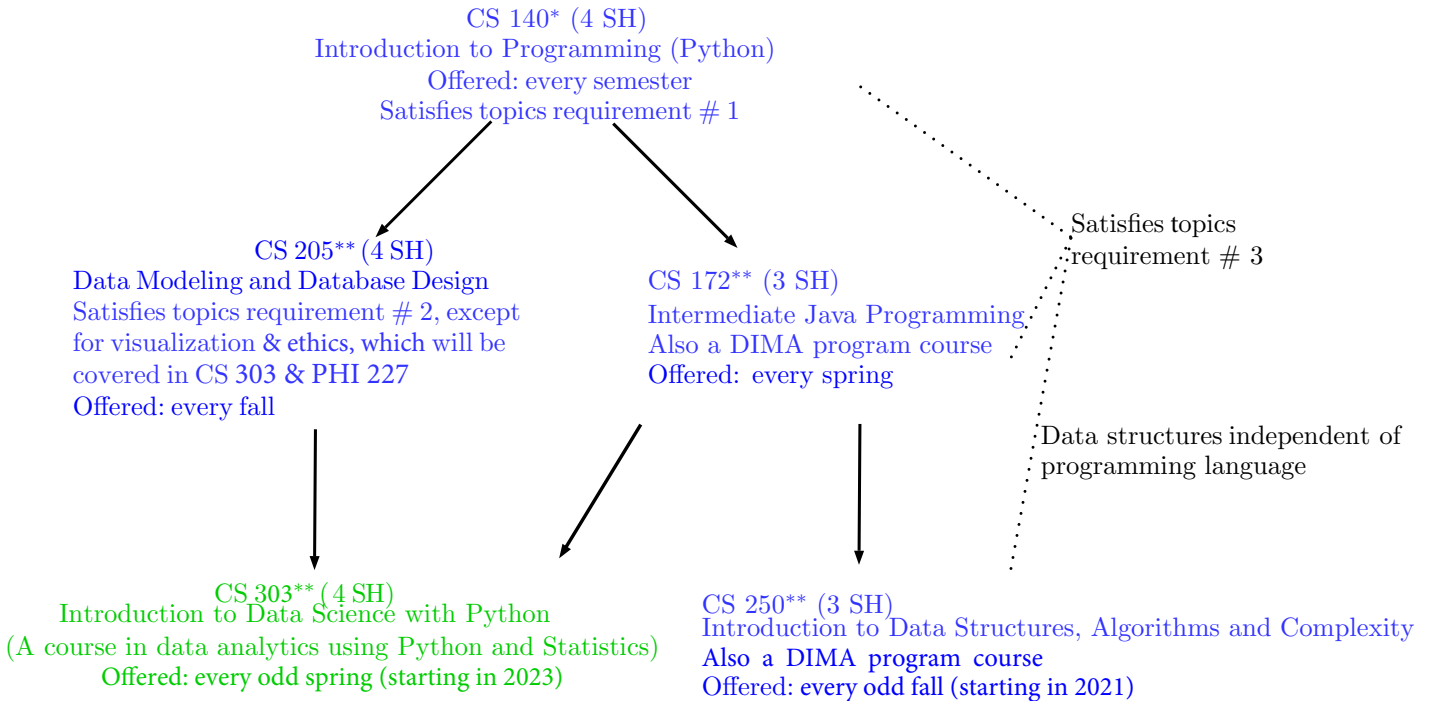Data Science and Machine Learning Option

Such students are required to take 14 credits worth of CS courses,
which are presented on the flowchart on the next page.

They address the following topics[#]:

1. Introduction to Programming: Python, fundamentals of coding, VB, VBA (the latter two for actuarial science)

2. Working with Data (data management etc): Exploring and manipulating data, data curation - databases and data management organization (big data), SQL, NoSQL data systems, data wrangling (acquisition, selection, cleaning, missing data, evaluation), Ethics, Visualization.

3. Design & analysis of algorithms course: Algorithms and software foundation, procedural and functional programming methods and data structures such as lists, vectors, data frames, dictionaries, trees, and graphs; memory and execution performance; documentation practices

CS Course Flowchart for BS in Applied and Computational Math

Math of DS&ML Option

CS 140* (4 SH)
Introduction to Programming (Python)
Offered: every semester
Satisfies topics requirement # 1

CS 205 (4 SH)**
Data Modeling and Database Design
Satisfies topics requirement # 2, except
for visualization & ethics, which will be
covered in CS 303 & PHI 227
Offered: every fall

CS 172 (3 SH)**
Intermediate Java Programming
Also a DIMA program course
Offered: every spring

Satisfies topics
requirement # 3

Data structures independent of
programming language

CS 303 (4 SH)**
Introduction to Data Science with Python
(A course in data analytics using Python and Statistics)
Offered: every odd spring (starting in 2023)

CS 250 (3 SH)**
Introduction to Data Structures, Algorithms and Complexity
Also a DIMA program course
Offered: every odd fall (starting in 2021)

* This course is a DS & ML option cognate
** These courses will be required for the BS in Applied and Computational Math DS & ML option

Arrows indicate a path through the courses

Required cognate: PHI 227 Ethics in Computing, satisfies competencies W II & I.L. & part of topics requirement # 2