



Introduction to Python

for applications to biomedical industries

BME 6303 | CRN 19454 | 3 credits

2:30-3:45 pm Central Time Mondays & Thursdays Online

Want to identify patterns in data & images (e.g., brain scans, protein sequences, Instagram feeds)? Predict infection rates? Grab data from the web?

Set yourself apart as a researcher or new job candidate, and learn Python!

Computing has revolutionized biology and bioengineering. Computer programs oversee medicine procedures, integrate data from fitness devices and phones, and guide health policy decisions worldwide. Biologists, bioengineers and medical students across all domains (e.g., molecular biology, regenerative medicine, infectious disease, fitness, health economics), would benefit from knowing how to program well. This course will introduce students to coding for biomedical applications using Python. Python is the **most in-demand programming language by employers** (Source: *IEEE Spectrum*). Python's utility across medical centers, the tech industry (e.g., *Google, Amazon*), and academia stems from its versatility, ease of use, and its open-source structure. **Introduction to Python for the Biosciences and Bioengineering** introduces the basics of Python's modules, functions, strings, lists, sorting and regular expressions.

Real-world, contemporary examples will be covered in class as students learn how to code in Python. Examples of programs that will be introduced include artificial intelligence methods to interpret images from brain scans and lab-grown tissues, bioinformatics programs to predict molecular biomarkers of infection, and time-dependent models to study daily exercise habits from wearable sensor data. Models that scrape public data from the web have been a key reference for health and political decisions, especially during the Covid pandemic; and students will learn how to use Python to scrape publicly accessible data sources. After completing the course, students will have the foundational background to be able to design their own programs, mine public biomedical data sources, and tackle a range of problems in biology and bioengineering using Python.

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