

Biomedical Data Research Course Elective

Summer Syllabus (June – August)

Schedule: 5 hours/week

Location: NYU College Prep Academy

Instructor: Dalton H Bermudez

Modality: Zoom

Course Description:

This course introduces high school students to the fundamentals of biomedical data analysis using publicly available datasets. Students will gain hands-on experience with Google colab and Python to explore real-world health and biomedical datasets. The course will culminate in student-led research projects presented in the form of a scientific journal article and a powerpoint presentation.

Learning Objectives:

- Understand basic concepts in biomedical research and data science
 - Learn how to use Jupyter Notebook for data exploration and visualization
 - Analyze biomedical datasets and interpret results
 - Develop independent research skills and scientific writing
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Required Tools:

- Laptop with internet access
 - Jupyter Notebook (installation required)
 - [Install for Windows](#)
 - [Install for Mac](#)
 - Python libraries: pandas, numpy, matplotlib, seaborn, sklearn (will be installed in class if needed)
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Weekly Schedule (Tentative):

Week 1: Introduction to Biomedical Data & Jupyter Notebook Setup

Week 2: [Python Basics for Data Science \(variables, data types, control flow\)](#)

Week 3: [Introduction to Biomedical Data & Working with Biomedical Datasets](#)

Week 4: Data Cleaning, Exploration, and Visualization

Week 5: Introduction to Statistics in Python (mean, median, std, correlation)

Week 6: [Introduction to Machine Learning in Biomedicine](#)

Week 7: [Project Proposal Workshop + Dataset Assignment](#)

Week 8: Guided Work on Student Projects (Instructor mentorship)

Week 9: Drafting Scientific Papers (Structure, Abstracts, Results, Discussion)

Week 10: Final Project Presentations and Peer Review

Final Project: Students will complete a research mini-project using biomedical data and submit a scientific-style article. Students are encouraged to use AI tools such as ChatGPT to assist with their coding and writing, but they are responsible for verifying the correctness of their work.

Grading (Pass/Fail):

- Participation: 30%
 - Project Progress: 30%
 - Final Presentation and Paper: 40%
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Instructor Support:

- Weekly feedback sessions
 - 1-on-1 mentorship during project phase
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Office Hours: By appointment