



TECH.UB.0023 01 & 02: Intro to Programming & Data Science

FALL 2021 MW 9:30-10:45am & 11am-12:15pm

Class Start Date: Thursday, September 2nd Class End Date: Tuesday, December 14th

Classroom: KMC: 4-80

DRAFT SYLLABUS

Instructor:

Navin Manglani, nmanglani@stern.nyu.edu

Professor Bio: <http://w4.stern.nyu.edu/faculty/bio/nmanglan>

Office Location: KMC 8-171

Office Hours: Tues, Wed (virtual), Thurs: 3:30-4:30

Booking By appointment only (24 hour notice required): www.calendly.com/nm99/oh

Description:

This course is intended to teach those with no programming background how to program and manipulate basic data using Python 3. This class is structured to be very interactive, and key concepts will be reinforced in class by allowing students to code on their laptops along with the instructor. After the completion of the course, students will be able to write intermediate level programs involving data using Python. This can serve as a good foundation to learn other applications of Python (such as data visualization, mobile development, etc.) as well as other programming languages such as Ruby on Rails and Perl. The class will also teach students how to create a database and manipulate data using SQL (and assumes a prior knowledge of SQL). Lastly, the class will teach students how to analyze data using data science libraries in Python.

Scope of Class:

By the end of this class, in addition to understanding the uses of Python and command line basics, students will be able to use Python to:

- Output data and information
- Create variables and objects
- Prompt for and store user input
- Use conditional and loop constructs to control flow execution
- Create and execute functions
- Test & debug programs
- Create structured data with lists & tuples
- Create object-oriented python programs (Including inheritance & polymorphism)
- Leverage SQL to create a database within Python
- Apply data science principles using the Pandas and numpy libraries in Jupyter Notebook

Students will also learn about the:

- Various applications of Python

- Best practices in writing Python code
- Techniques to debug Python programs
- Differences between Agile and Waterfall development methodologies
- Create a relational database using Entity Relationship Modeling & Logical Modeling
- Normalizing data
- Difference between data analytics and data science
- Principles of and approaches to data science

Pre-Requisites:

A prior knowledge of SQL is assumed for this course. It is highly recommended to take Tech.UB.0001 (Information Technology in Business & Society) simultaneously or prior to this class, unless you have a prior knowledge of SQL or are willing to do some work outside of class to learn it on your own.

Requirements:

Laptop (Required): A laptop that can run Python and have at least 500 MB free is required.

Textbooks (Highly Recommended):

Python Section: *Murach's Python Programming* by Michael Urban and Joel Murach, 2016 Edition. Available at NYU Bookstore and online.

SQL / Database Section *Database Systems: Introduction to Databases and Data Warehouses*, by Nenad Jukic, Susan Vrbsky, Svetlozar Nestorov (Edition 1 or 2 is fine)

Data Science Book: TBD

Supplemental readings, homework assignments, solutions, data sets and other relevant information will be posted on Classes.

Grading:

Class Attendance and Professionalism (10% of final grade): Attendance is taken at the start of every class by students signing the attendance sheet. Students who do not sign the attendance sheet at the start of class will be marked late and / or absent if they fail to sign. Please be sure to sign one of the attendance sheets as soon as you walk in to get credit for being on time. Professionalism includes students turning off computers except when you are asked to do lab work, not web surfing or doing other work not related to the class during class time and turning cell/smartphones off during class. Students are able to check their attendance records on NYU Classes. Any questions on class attendance records should be directed to the Teaching Assistant.

Per NYU policies: Faculty will excuse absences only in the case of documented serious illness, family emergency, religious observance, or civic obligation. Please refer to NYU's policy on Religious Holidays - <https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/university-calendar-policy-on-religious-holidays.html> . In accordance with this policy,

if you will miss class for religious observance or civic obligation, whenever possible, notify the faculty member in advance of such anticipated absence. Recruiting activities and business trips are not acceptable reasons for absence from class. If a student is absent from the first day of an intensive course, the instructor may request that the student be removed from the course. Students are expected to arrive to class on time and stay to the end of the class period. Arriving late or leaving class early will have impact on the course grade. Students may enter class late only if given permission by the instructor and can do so without disrupting the class. (Note that instructors are not obligated to admit late students or may choose to admit them only at specific times and instructors are not obligated to readmit students who leave class.)

Personal Days: This class provides two personal days or unexcused absences where a reason does not have to be provided for missing class (it can be a recruiting activity, etc). These personal days cannot be exam dates or the date of your presentation. It is recommended that these absences are taken during individual presentations or group presentations. You are responsible for making up any work you miss during a personal day.

Arriving Late, Leaving Early, Coming & Going (per NYU policies): Students are expected to arrive to class on time and stay to the end of the class period. Arriving late or leaving class early will have impact on the course grade. Students may enter class late only if given permission by the instructor and can do so without disrupting the class. (Note that instructors are not obligated to admit late students or may choose to admit them only at specific times and instructors are not obligated to readmit students who leave class.)

Participation (10% of final grade): Class participation is a crucial element of the class. Students are expected to actively participate in class discussions by answering the professor's questions and coming to class prepared with the information on the cases. Students should bring a name tag to every class or state their name clearly. Students who fail to participate / speak in class may receive a 0 out of 10 for their final participation score.

Assignments (16% of final grade)

Assignments will give students the opportunity to apply the skills learned in class discussion, textbooks and class exercises. Assignments will be checked for completeness (complete vs. incomplete, with a grade of either 1 or 0) but not graded. Students are responsible for checking their own assignments against the answer keys. Per NYU policy, late assignments will either not be accepted or will incur a grade penalty unless due to documented serious illness or family emergency. Instructors will make exceptions to this policy for reasons of religious observance or civic obligation, when students make arrangements for late submission with the instructor in advance.

While standard NYU policies state that students may not work together on graded assignment, in this particular class, the instructor gives express permission to work together on assignments, however an individual submission is required. No group submissions will be accepted.

Pop Quizzes (0-10% of final grade, Assignments & Participation grades will be adjusted accordingly.) The instructor reserves the right to administer up to two pop quizzes that may be given at any point during the course. The pop quizzes will cover questions from assignments or the previous lecture.

Exams (64% of final grade)

There will be four exams for the class. Each exam will be based on selected chapters from the textbook, slides from class and affiliated homework assignments. Each exam will be worth 16%. Below are the **tentative** dates for the exams. The final schedule will be updated by the first day of class. Please note snow days, school closings or changes in the syllabus may result in shifting of exam dates.

Exam # 1: M 10/4

Exam # 2: W 10/27

Exam # 3: M 11/29

Exam # 4: Final Exam Week per NYU Exam Schedule (NYU Releases the date in October)

NO MAKEUP EXAMS WILL BE GIVEN AND EXAMS MUST BE TAKEN ON THE DAYS SPECIFIED. Students who fail to show up for an exam will receive a "0" for the exam.

Course Policies:

Academic Integrity

Integrity is critical to the learning process and to all that we do here at NYU Stern. As members of our community, all students agree to abide by the NYU Stern Student Code of Conduct, which includes a commitment to:

- Exercise integrity in all aspects of one's academic work including, but not limited to, the preparation and completion of exams, papers and all other course requirements by not engaging in any method or means that provides an unfair advantage.
- Clearly acknowledge the work and efforts of others when submitting written work as one's own. Ideas, data, direct quotations (which should be designated with quotation marks), paraphrasing, creative expression, or any other incorporation of the work of others should be fully referenced.
- Refrain from behaving in ways that knowingly support, assist, or in any way attempt to enable another person to engage in any violation of the Code of Conduct. Our support also includes reporting any observed violations of this Code of Conduct or other School and University policies that are deemed to adversely affect the NYU Stern community.

The entire Stern Student Code of Conduct applies to all students enrolled in Stern courses and can be found here: www.stern.nyu.edu/uc/codeofconduct

To help ensure the integrity of our learning community, prose assignments you submit to NYU Classes will be submitted to Turnitin. Turnitin will compare your submission to a database of prior submissions to Turnitin, current and archived Web pages, periodicals, journals, and publications. Additionally, your document will become part of the Turnitin database

General Conduct & Behavior

Students are also expected to maintain and abide by the highest standards of professional conduct and behavior. Please familiarize yourself with Stern's Policy in Regard to In-Class Behavior & Expectations (<http://www.stern.nyu.edu/portal-partners/current-students/undergraduate/resources-policies/academic-policies/index.htm>) and the NYU Student Conduct Policy (<https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/university-student-conduct-policy.html>).

Disability

If you have a qualified disability and will require academic accommodation of any kind during this course, you must notify me at the beginning of the course and provide a letter from the Moses Center for Students with Disabilities (CSD, 998-4980, www.nyu.edu/csd) verifying your registration and outlining the accommodations they recommend. If you will need to take an exam at the CSD, you must submit a completed Exam Accommodations Form to them at least one week prior to the scheduled exam time to be guaranteed accommodation

DMCA: Digital Millennium Copyright Act (DMCA):

Passed in 1998, DMCA criminalizes sharing copyrighted work online. Material used in this is licensed from Cengage, Harvard Business Publishing and other sources in to supplement lectures that have been licensed to use JUST WITHIN THIS CLASS. Do not post online (including Coursehero.com), e-mail, distribute in any way online or in-person, any of the following: course slides, syllabus, assignments, assignment solutions, tests, test solutions, cases and case solutions. **If you violate this policy you may receive an F in this class and may face severe academic disciplining,** This not just puts you at risk for conducting criminal activity, but also puts the university and me at risk for violating our licensing use with Cengage,

Laptop Policy

A laptop is required. As a programming class, you are encouraged to use your laptop in class, except during exams. There are a handful of lectures that don't require the use of a laptop.

Exam Attendance

Makeup Exams will not be given. Those who fail to show up for any exams will receive a zero for the exam. Those who show up late to exams must finish the exam within the originally allotted time and will not be allowed to submit their exam late.