**Web Development with Python and MYSQL**

INFO1-CE9367.001| Summer 2024 | Saturdays 6/22 – 8/10/2024

Online Synchronous via Zoom Sessions

Course Site URL: [https://brightspace.nyu.edu/d2l/home](https://brightspace.nyu.edu/d2l/home/295415)

**General Course Information**

Faculty Name & Title: Sam Sultan, Adjunct Assistant Professor

NYU email: sam.sultan@nyu.edu

Class Meeting Schedule: Saturdays (6/22/2024 - 8/10/2024) 9:00am-1:00pm

No class: Not Applicable

Class Location: Online Synchronous through Zoom.

Office Hours: Email instructor to request an appointment.

**Description**

Learn the fundamentals of two of today’s most popular tools in the web development space. MySQL is the world’s most popular open-source database management system. Because it is readily available, low cost, and easy to install and use, many Internet service providers use MySQL and offer access to MySQL database services to potential clients. Python is another open-source general purpose programming language that has gained tremendous popularity of late. Learn both MySQL and Python, and use this powerful combination to design user-friendly, form-based HTML front end application that communicates with MySQL database servers to create dynamic websites.

**Prerequisites**

Basic HTML knowledge is required.
Knowledge of another programming language is a plus, but not required

**Learning Outcomes**

* A working knowledge of the Python programming language, and how to use Python on the web.
* Learning SQL programming by utilizing the MySQL database server
* Understanding the HTTP communication protocol and how to take advantage of its various capabilities and features.
* Combine HTML, Python, HTTP and MySQL to create a dynamically driven website with a backend database server.

**Communication Methods**

Be sure to turn on your [NYU Brightspace notifications](https://www.nyu.edu/servicelink/KB0018507) and frequently check the “Announcements” section of the course site. This will be the primary method I use to communicate information critical to your success in the course. To contact me, send me an email. I will respond within 24-48 hours.

**Structure | Method | Modality**

There are 8 session topics in this course. The session topics are both lectures and hands-on practice.

There will be exercises/assignments throughout the course. There will also be a final project and a final exam that will test student acquisition and learning of course materials. Course sessions will be conducted synchronously on NYU Zoom, which can be accessed from the course site in [NYU Brightspace](https://brightspace.nyu.edu/).

**Expectations**

Learning Environment

You play an important role in creating and sustaining an intellectually rigorous and inclusive classroom culture. Respectful engagement, diverse thinking, and our live experiences are central to this course, and enrich our learning process.

Participation

You are integral to the learning experience in this class. Be prepared to actively contribute to class activities, discussions, and work outside of class. Each student is expected to ask at least one question or respond to instructor or other student question or inquiry at least once every session.

Assignments and Deadlines

Assignment should be completed before due date. Due dates in most cases are one week from assigned dates, and are due prior to meeting the following week. Assignment and questions relating to assignments are covered and discussed during the first few minutes of the following week’s session.

Course Technology Use

You will need a computer to access the course session via NYU Zoom. Course content is provided online over the internet through various web pages and Microsoft Word documents. Access to MySQL database is also provided over the internet.

Feedback and Viewing Grades

I will provide feedback on your work/project and exam via our course site in NYU Brightspace. You can access your grades on the course site Gradebook. Grades will be posted within 1 week of submission.

Attendance

I expect you to attend all class sessions. Attendance will be taken into consideration when determining your final grade. Refer to the [SPS Policies and Procedures page](https://www.sps.nyu.edu/homepage/student-experience/policies-and-procedures.html) for additional information about attendance.

**Textbooks And Course Materials**

* Instructor will provide all course content and session by session reading material, examples and demos, and other content which are all available online via class website at
* <https://workshop.sps.nyu.edu/~sultans/pythonweb>

**Grading | Assessment**

Your grade in this course is based on your performance on multiple exercise assignments, a final exam, and on the delivery of a final project that represents a fully functional website that utilizes Python and MySQL. Keeping up with the course content, materials and practice is utmost important and it is directly related to course objectives and learning outcomes, failure to do so will result in attaining an unsatisfactory course grade.

Course grading and assessment is based on:

DESCRIPTION PERCENTAGE

Attendance and class participation 10%

Final Project 40%

Final Exam 50%

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TOTAL POINTS 100%

*You can choose to take the course using a Pass/Fail option. You can also choose to take it on a Non-Evaluative basis. In either case, if you are taking multiple NYU courses leading toward a Certificate, the Pass/Fail or the Non-Evaluative option will not be credited toward attaining that certificate. If you choose the P/F or NE option, you must submit a P/F or NE form prior to the final exam.*

**Course Outline**

**Week 1, Session 1a, Introduction to Python**

* Introduction to Python.
* Python variables.
* Numeric and string operators.
* Comparison and logical operators.
* Working with Lists, Tuples, and Dictionaries.

**Week 1, Session 1b, Introduction to Python**

* Control Structure and Program Flow.
* The **if** conditional statement.
* Logical Operators, **and**, **or**, **not**
* The **while**, and **for** loop statements.
* Passing arguments from the command line
* Prompting a user for input

**Week 2, Session 2, Python Built-in Functions**

* Working with Strings.
* String Functions
* Working with Numbers
* Number Functions
* Working with Dates
* Date Functions
* Working with Lists, Tuples and Dictionaries
* Defining your own functions
* Calling your own functions
* Passing and returning data from functions

**Week 3, Session 3, Python Built-in Functions**

* List Functions
* Tuple Functions
* Set Functions
* Dictionary Functions
* Analytics Functions
* Sorting Lists
* Two Dimensional Lists and Dictionaries
* Iterating through 2-Dimensional Structures
* Introducing **Lambda** functions

**Week 4, Session 4a, The SQL Programming language**

* SQL - Structured Query language
* DDL - Data Definition language
* DML - Data Manipulation Language
* SQL standard vs. vendor extensions
* Our first database
* The SELECT statement
* The FROM clause
* The WHERE clause
* Comparison operators
* Using SELECT DISTINCT

**Week 4, Session 4b, Performing Table Joins**

* Selecting data from multiple tables
* The join construct
* Old vs. new join syntax
* Normal or Inner join
* Cross join - Cartesian product
* Outer join vs. Inner join
* What is a Self Join
* Performance considerations

**Week 5, Session 5a, Creating Database Tables & Objects**

* Creating database objects
* What is a primary key?
* What is a foreign key?
* What is an index?
* Creating tables
* SQL data types
* Adding a primary key
* Adding constraints
* Creating Indexes
* Altering table definition
* Dropping tables

**Week 5, Session 5b, Insert, Update and Delete**

* Manipulating data in tables
* Adding data with the INSERT statement
* INSERT with a SELECT statement
* Changing data with the UPDATE statement
* UPDATE with a SELECT statement
* Removing data with the DELETE statement
* DELETE with a SELECT statement

**Week 6, Session 6, Accessing/Storing Web Data**

* Accessing HTML form data
* The GET method
* The POST method
* Connecting to a database
* Inserting, Updating & Deleting from databases
* Querying databases

**Week 7, Session 7, The HTTP Protocol**

* HTTP - HyperText Transfer Protocol
* The client request
* The server response
* The GET and POST methods
* Accessing client headers
* Creating and adding server headers

**Week 8, Session 8, Creating Persistence on the Web**

* Repopulating HTML Form Fields
* Using Form Hidden Fields
* Using the end of the URL
* Using Cookies
* Creating Cookies (temporary and more permanent)
* Retrieving Cookies
* Redirecting to Another Page
* Custom web sessions
* **Final Exam**
* **Final Project Submission**

**Extra – If time permits**

* SQL built-in Functions
* Arithmetic functions - ABS, RAND, ROUND, TRUNCATE
* Character functions - CONCAT, LENGTH, SUBSTR, TRANSLATE
* The CASE expression
* Date functions - Current date, date manipulation, date formatting
* Aggregating and Grouping
* Aggregate functions - COUNT, SUM, AVG, MIN, MAX
* Grouping with GROUP BY clause
* The HAVING clause
* The ROLLUP feature
* Sorting with the ORDER BY clause

**NOTE:** The syllabus may be modified to better meet the needs of students and to achieve the learning outcomes.

**New York University School of Professional Studies Policies**

1. Policies - You are responsible for reading, understanding, and complying with [University Policies and Guidelines](http://www.nyu.edu/about/policies-guidelines-compliance.html), [NYU SPS Policies and Procedures](http://sps.nyu.edu/academics/academic-policies-and-procedures.html), and [Student Affairs and Reporting](https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/student-services.html).

2. Learning/Academic Accommodations - New York University is committed to providing equal educational opportunity and participation for students who disclose their dis/ability to the [Moses Center for Student Accessibility](https://www.nyu.edu/students/communities-and-groups/student-accessibility.html). If you are interested in applying for academic accommodations, contact the [Moses Center](https://www.nyu.edu/students/communities-and-groups/student-accessibility/academic.html) as early as possible in the semester. If you already receive accommodations through the Moses Center, request your accommodation letters through the [Moses Center Portal](https://www.nyu.edu/students/communities-and-groups/student-accessibility.html) as soon as possible (mosescsa@nyu.edu | 212-998-4980).

3. Religious Observance - As a nonsectarian, inclusive institution, NYU policy permits members of any religious group to absent themselves from classes without penalty when required for compliance with their religious obligations. Refer to the [University Calendar Policy on Religious Holidays](https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/university-calendar-policy-on-religious-holidays.html) for the complete policy.

4. Academic Integrity and Plagiarism - You are expected to be honest and ethical in all academic work. Moreover, you are expected to demonstrate how what you have learned incorporates an understanding of the research and expertise of scholars and other appropriate experts; and thus recognizing others' published work or teachings—whether that of authors, lecturers, or one's peers—is a required practice in all academic projects.

Plagiarism involves borrowing or using information from other sources without proper and full credit. You are subject to disciplinary actions for the following offenses which include but are not limited to cheating, plagiarism, forgery or unauthorized use of documents, and false form of identification

[Turnitin](https://www.nyu.edu/servicelink/KB0018471), an originality detection service in NYU Brightspace, may be used in this course to check your work for plagiarism.

Read more about academic integrity policies at the NYU School of Professional Studies on the [Academic Policies for NYU SPS Students](https://www.sps.nyu.edu/homepage/student-experience/policies-and-procedures.html) page.

5. Use of Third-Party Tools - During this class, you may be required to use non-NYU apps/platforms/software as a part of course studies, and thus, will be required to agree to the “Terms of Use” (TOU) associated with such apps/platforms/software.

These services may require you to create an account but you can use a pseudonym (which may not identify you to the public community, but which may still identify you by IP address to the company and companies with whom it shares data).

You should carefully read those terms of use regarding the impact on your privacy rights and intellectual property rights. If you have any questions regarding those terms of use or the impact on the class, you are encouraged to ask the instructor prior to the add/drop deadline.