CSCI-UA.60-1, Spring 2020

Database Design and Implementation: Syllabus

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Syllabus

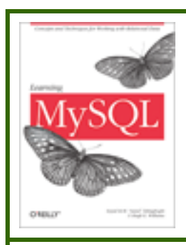
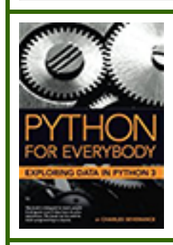
- Class hours: Tuesdays and Thursdays 2:00 - 3:15PM, WWH Room 102
- Instructor Office hours: Mondays 3:30-4:30PM, Thursdays 11:30AM-12:30PM and by appointment on Zoom at https://nyu.zoom.us/j/405326798
- Tutoring hours - We are fortunate to have Kainat Naeem (*email*) tutoring for us this semester.
    - You can find Kainat on Zoom at https://nyu.zoom.us/j/7271826446
    - Mondays 6am-9:30am EST on Zoom - NOTE: This session is designed to meet the needs of students in Asia but is open to all students in the class.
    - Wednesdays 12:30 - 4:00 :00 PM EST on Zoom - NOTE: This session is designed to meet the needs of students in the USA but is open to all students in the class.
    - Fridays by video conference on Zoom 9:00AM - 12:00 PM EST on Zoom for all students in the class.
- Exam Schedule:
    - Midterm Exam: Thursday March 12, 2020 *(Updated 2/6/2020)*
    - Final Exam: Thursday May 7, 2020
- Pre-requisite: CSCI-UA.2 or equivalent

CSCI-UA.60 can be used as one of the four courses which make up the Web Programming and Applications Minor.

Course Description: This course introduces principles and applications of database design and working with data. Students use python as they prepare, analyze and work with data; SQL to study the principles and implementations of relational databases; and are introduced to other database paradigms such as NoSQL. Students apply these principles to computer systems in general and in their respective fields of interest.

I encourage students to explore not only the principles of database design but also specific database issues and data complexities in their respective fields of study. Please do not hesitate to contact me with any questions. I look forward to working with all of you.

Required Textbooks:

	Learning MySQL by Tahaghoghi and Williams Published by O'Reilly http://shop.oreilly.com/product/9780596008642.do Print ISBN: 978-0-596-00864-2 | ISBN 10: 0-596-00864-3 Ebook ISBN: 978-0-596-10526-6 | ISBN 10: 0-596-10526-6
	Python for Everybody: Exploring Data in Python 3 by Dr. Charles Russell Severance (Author), Sue Blumenberg (Editor), Elliott Hauser (Editor), Aimee Andrion (Cover Design) (free download) ISBN-10: 1530051126 | ISBN-13: 978-1530051120 Open Textbook Library Edition (free)
	Beginning Database Design: From Novice to Professional [Paperback] Clare Churcher Publisher: Apress; http://www.apress.com/9781590597699 ISBN-10: 1430242094 ISBN-13: 978-1430242093

Optional Textbooks:

	Using SQLite By Jay A. Kreibich Publisher: O'Reilly Media Released: 2010 http://shop.oreilly.com/product/9780596521196.do ISBN-13: 978-0596521189 ... ISBN-10: 0596521189
	MongoDB: The Definitive Guide, 2nd Edition By Kristina Chodorow Publisher: O'Reilly Media Released: 2013 http://shop.oreilly.com/product/0636920028031.do ISBN-13: 978-1449344689 ... ISBN-10: 1449344682

Help Options:

Whenever you have a question about the course material, please feel free to drop by during my office hours or write me an email message. If at any time you feel that you are Springing behind or are overwhelmed by the material, let me know and I will be very happy to help you. In addition, a tutor will be available to work with this class.

Homework Policy:

- Twnety percent (20%) of the grade will be deducted for assignments submitted late but during the first week after the due date. Students must have the instructor's permission to later than one week after the due date.
- You should save all of your programs and back them up or store copies of the files for the entire semester.
- You may submit one homework up to one week late without penalty. In that case, please be sure to advise the instructor before the due date & time (midnight of the due date) that you will be using your "freebie extension".
- Please make sure to read the CS department statements on Academic Integrity for more details and let me know if you have any questions.

Grading:

This course will require one mid-term exam (25% of the final grade); a final exam (35% of the final grade); and approximately eight homework assignments (accounting for 40% of the final grade). In most of the assignments, students are encouraged to select data / content that reflect students' major or minor studies or other interest(s).

Unix account:

All students will be assigned a UNIX account on a university server for this class.

Software:

The server-side software for this course will be available on the server that we use in class. We will also use open source (free) software) for your projects, listed below.

- Python and additional python libraries
- SQLite
- Anaconda/Spyder or the Python IDE of your choice
- MySQL WorkBench

Topics

- Using Python to prepare datafiles; explorations of "data in the wild"
- Using Python for data anlysis.
- Introduction to data visualization; using Python to build charts and graphs.
- Introduction to SQL with SQLite
- Relational database Design
- Server-side SQL: We will use MySQL in class and also discuss Oracle and PostGreSQL
- NoSQL: Introduction to MongoDB
- Discussion of other database paradigms such as Graph databases [Time-permitting]