

# COMP 353 Syllabus

## Fall, 2018

*Title:* Database Programming

*Time/Place:* Online, asynchronous. Sunday meetings by appointment. Zoom when needed.

*Instructor:* Channah F. Naiman

*Email:* [naiman@htc.edu](mailto:naiman@htc.edu)

**Orientation** (ignore any references in the video to virtual machine. We do not have virtual machines available. You will have to install all software on your computers.)

### **Conceptual Framework**

"To Learn, To Teach, To Observe, and To Do." The student should be *a Critical Thinker, Effective Communicator, Proactive Educator, and Moral Practitioner.*

### **Description**

This section of COMP 353 will use Python to access a MySQL database both locally and remotely. The Flask web development framework is used. We will incorporate both standard SQL queries as well as SQLAlchemy as an object-relational mapping (ORM) tool. A complete website with user account support and CRUD capabilities is developed. Python will also be used to introduce MongoDB for data cleaning and querying, using the MongoDB Aggregation Framework as well as the MongoDB query language. We will use Jupyter Notebooks for interactive testing, MongoDB Atlas as a cloud-based host, and Compass as a local GUI.

### **Table of Contents**

- [Prerequisites](#)
- [Textbooks](#)
- [Course Outcomes and Learning Objectives](#)
- [Software](#)
- [Academic Integrity](#)
- [Lateness Policy](#)
- [Course Components and Grading](#)
- [Course Schedule](#)

### **Prerequisites**

CAIH271 or CAIH 250 (or equivalent) or permission of instructor

### **Textbooks (and other materials used in place of a text)**

No single textbook covers all of the topics for the course. There are many resources available for the different components of the course:

- *Database Design and SQL*: Many of the lectures and assignments will draw upon Fundamentals of Database Systems, by Elmasri and Navathe, 7th edition. The text has a chapter that discusses PHP programming; however, expect to use publically-available resources on the web for the hands-on segment of the course. The 7th edition is the most recent. I bought a pdf version for \$3 on ecrater.com, but I understand that it is now easily found online

for free. The fundamentals, which are relational database design, do not change. I will also provide detailed labs for SQL.

- **Python:** There are too many resources on Python to list here. But here are a few:
  - For our “text” for this segment of the course, we are using a [Python web development video series](#) by Corey Schaffer. I have created my own videos emphasizing and explaining the features that we need for this course. In addition, I have created our own labs which further explore the database-related features (and other cool stuff!)
  - An interactive web version of [How to Think Like a Computer Scientist](#) starts with pretty much the same basics as the [Hands-on Python Tutorial](#), but in a somewhat different order with a different graphics library, and goes much further, and allows you to program totally inside the browser, and has embedded videos. There is also an older, somewhat different, non-interactive pdf version.
  - <http://python.org> Home site for the Python language, where you can find out more and download the latest production version starting with a 3 (3.6.1 in March 2017). Caution: an *incompatible 2.7* version may be listed first in the downloads.
  - <http://www.pythontutor.com/> A wonderful site where you run code in your browser step by step and save and email a URL reference to any step.
  - [Extra Material on IDLE errors messages](#)
  - An online interactive presentation with online exercises, covering pretty much what I do, though they do functions much later: <http://cscircles.cemc.uwaterloo.ca/> They incorporate the pythontutor.com functionality referenced above. The page has a link to a large collection of videos, Python from Scratch.
  - <https://groklearning.com/course/intro-python-1/> : Gentle Python intro, also totally in the browser.
  - [http://en.wikibooks.org/wiki/Non-Programmer's\\_Tutorial\\_for\\_Python\\_3](http://en.wikibooks.org/wiki/Non-Programmer's_Tutorial_for_Python_3) Another introduction to Python basics in different words. No graphics, few major examples, lots of basic syntax.
  - [Official Python 3 Tutorial](#) *moves very fast for someone with no programming background*. It covers a lot, going well past our course!
  - <http://codecademy.com/step-by-step>, but with *Python 2, not 3*.
  - [Software Carpentry - Python](#) is an intro for data scientists using the numpy library and the nice development/display environment ipython.
  - A long further list at <http://wiki.python.org/moin/BeginnersGuide/Programmers>
  - A very nice, surprisingly short book that covers many topics concisely: Mike McGrath, [Python in Easy Steps](#).
- For Mongo, we are using some of the MongoDB website videos, as well as some publically-available websites and example files.

## Course Outcomes and Learning Objectives

**Outcomes:** Students will learn to design and implement a transactional relational database; to develop a web application to access and manipulate the database; and to query a NoSQL database. Students will understand the fundamental concepts of database design and implementation using both SQL and NoSQL

### Learning Objectives:

- Learn fundamental principles of the relational model, normalization and functional dependencies
- Apply data modeling concepts and techniques to capture the conceptual model of an application
- Create and query a relational database, using SQL
- Implement a web database application (in this case, in Python), using a web development framework (in this case Flask) and an object-relational mapper (in this case flask-sqlAlchemy).
- Query a remote and a local NoSQL database.

## Software (instructions and links for all software is detailed in the [Orientation](#))

- MySQL/MariaDB (MariaDB is a clone of MySQL), Apache web server (or some other local web server), and some way to interface with the database. The easiest way to handle this is to install a WAMP (or MAMP, for macs) stack. I am using [XAMPP](#), and I have supplied detailed instructions on the [Orientation](#).
- Python

- Flask
- Flask-sqlAlchemy
- Anaconda
- MongoDB
- Atlas free-tier hosting
- Compass (a GUI for MongoDB)

## Academic Integrity

Hebrew Theological College is committed to providing an academic community and learning environment based on honest inquiry and pursuit of knowledge that fosters commitment and adherence to Judaic tenets. The faculty and administration of Hebrew Theological College have specified the following acts as serious violations of personal honesty and academic ideals that jeopardize the quality of education within a Torah environment:

- Submitting as one's own, material copied from a published source.
- Submitting as one's own, another person's unpublished work or examination material.
- Submitting as one's own, a rewritten or paraphrased version of another person's work.
- Purchasing, acquiring, and using for course credit a pre-written paper.
- Allowing another to write or research a paper for one's own benefit.
- Copying electronic or printed media for one's own use without permission or licensing from appropriate publishers.
- Submitting the same paper for more than one course without explicit permission from the instructor(s).

More information about HTC's Academic Integrity policy can be found on page 15 of the Student Handbook.

## Lateness Policy

Assignments are due as specified in the syllabus Course Schedule and on Canvas. Any extensions in due dates will be announced in class and sent as email announcements on Canvas. Except that I can't seem to get Canvas to send out email announcements, so I'll try to. In the rare event that I allow an individual student to submit an assignment late, it will be graded as half credit. Most assignments are in-class assignments and must be completed during class time.

## Students requiring disabilities accommodations

Any student, who, because of a disability, may require some special arrangements in order to meet course requirements should contact the instructor as soon as possible to make necessary accommodations and share appropriate documentation from the Office of Special Services, provided by HTC's Disabilities Officer, Dr. Richard Aronoff.

## Course Components and Grading

- *Lecture/Lab:* The lectures and labs for the first four weeks will be during class time, in person. Some labs may not be completed in class, and you may be permitted to complete them after class. Lectures and labs are also fully supported by videos. After the first four weeks, the rest of the course is completely "flipped", meaning that you are responsible for watching the lecture and lab videos before coming to class.
- *Lab assignments:* Beginning in week 6, most class sessions will require watching the lecture/lab videos and then participating in a lab assignment, which you may complete with a partner (or all three of your together). We can also zoom at the beginning of a class session (let's say a Sunday to answer any questions that you may have on the lectures and labs that you watched before coming to class. I can then introduce

your “in-class” lab assignment, which must be completed within a few days after the Sunday “class”. Please come to class prepared!! It will be nearly impossible to complete the in-class lab assignment without having reviewed the lecture and lab videos before coming to class!! Given that there is no homework for this part of the course, it is important to watch the lectures before attempting the lab assignments. One of assignments is longer than the rest, and it may be assigned as a homework, or it may be used as a possible second exam, see below.

- *Exam:* As of this writing, there is one exam, scheduled on November 11. It covers the material on the first four weeks (Database Design and SQL queries). This exam will be online. You will have 2.5 hours to complete the exam.
- *Possible second exam:* If I am not satisfied with the performance and/or participation on the in-class assignments for the Python-ORM module of the course, then there will be a second exam, on that material. If there is a second exam, it will be announced at least two weeks before the exam will take place.
- *Project:* There is a project, which takes the place of a final exam. You are required to build a web application that accesses a database that you will design. You are required to use the skills covered in the course (Python, SQL and ORM queries, etc.). You may use our sample programs as templates—in fact, I strongly suggest that you do). But you will have to design and implement CRUD for your own database application. Projects will be presented during the Final Exam time slot. I am not sure at this point that I will allow videos instead of an in-class presentation. We can discuss this as the time for the presentations gets closer. The project will be discussed more in class.
- *Team Work:* For some assignments, and for the project, you will be allowed (or sometimes required) to work in a team. Full participation is required!! **Do not assume that if your team completes the assignment or a project that all team members will automatically be assigned the same grade.** For the project, I will check your GitHub site for commits, and I will gauge individual participation through team meetings with me (in class and via zoom). For assignments, I will walk around the class meeting with each team and ask questions to assess your participation. At any point, I reserve the right to disband a team for an in-class assignment and require individual completion and submission.

## Grading

The course is worth 1015 points. It will be graded on the basis of 1000 points. In the event that our pace does not allow us to complete everything listed, I will base the grade out of the number of points for the completed components that were actually assigned.

Course Component	Points	Course Component	Points
Orientation:		DB Design and Modeling:	
Tour of the Course and Syllabus screenshot	5	Homework #1	50
		Homework #2	50
XAMPP:		Homework #3	50
Screenshot of Server Installation	10	Homework #4	50
Screenshot of SQL Test Command	10	Python-Flask-ORM:	
Screenshot of terminal window	10	In-class-Lab-02-Templates	40
Python-Flask-ORM:		In-class-Lab-03-Forms	40
Screenshot of pip install flask	5	Homework-Lab-4a-connect	40
Screenshot of flaskHelloWorld.py	10	Lab-4c-culminating assignment	100
Mongo:		MongoDB:	
Screenshot of Atlas Cluster	10	Lab 1a Questions, Compass	40
Screenshot of terminal mongo commands	5	Lab 1b Queries and text index	40
Exam on DB Design and Modeling	150	Lab 2a Local DB, citibikes query	40
		Lab 2b Aggregation	30
Project	200	Lab 3 elemMatch	30

**Course Schedule. This schedule is subject to slight changes to accommodate student progress and interest.**

Week	Date	Topic/Text/Links	Videos	Assignments
<b>Module #1: Database Design and SQL</b>				
1	10/14	<p><b>Intro and ER Modeling</b></p> <ul style="list-style-type: none"> <li>Administrative introduction, syllabus</li> <li><b>Chapter 1:</b> DB History, Motivation, basic terminology (<a href="#">lecture ppts</a>)</li> <li>Intro Overview: integrity, concurrency, SQL</li> <li><b>Chapter 2:</b> Schemas, DBMS, Architectures</li> <li>Supplier-Parts: motivational example (actually references topics in Chapter 15.1 - 15.4)</li> <li><b>Chapter 3:</b> ER Diagrams. (<a href="#">PPTs</a>)</li> <li><a href="#">Pilot-Plane Type</a> (example with many flaws)</li> <li>Use any modeling tool you want, even Word or PPT. BETTER: try <a href="#">ER Assistant</a> (Windows only); <a href="#">Glify</a>; something like <a href="#">Draw.io (I don't prefer their EER notation, but no biggie)</a>; <a href="#">StarUML</a>; <a href="#">ErDraw</a> (ok EER notation) <a href="#">Dia</a> (<a href="#">Windows</a> or <a href="#">mac</a>); <a href="#">Lucid</a> (You can keep renewing the free trial); <a href="#">ERDPlus</a> (seems cool and very clear!); worst case, draw and scan into a pdf file. That is really a worst case. Yeah, don't do that....</li> <li>You can go another direction entirely, and use SQL Workbench as an alternative to PHPMyAdmin, and also for ERD design. You're on your own with that, but if you're comfortable with it, great.</li> <li><b>Discuss Orientation</b> test software installation on laptops. It's part of your Orientation points, which also include testing PHPMyAdmin by creating a University database, and populating with this <a href="#">DDL and Insert</a> file. For more detailed instructions and links, see <a href="#">Orientation</a>.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">1.1</a> : Intro</li> <li><a href="#">1.2</a>, <a href="#">1.3</a>, <a href="#">1.4</a>: Famous example Supplier/Parts</li> <li><a href="#">1.5</a>, <a href="#">1.6</a>, <a href="#">1.7</a>, <a href="#">1.8</a>, <a href="#">1.9</a>: text PPTs (revised for lecture)</li> <li><a href="#">1.10</a>: <a href="#">Pilot-PlaneType</a></li> <li><a href="#">1.11</a>: Discussion of <a href="#">HW#1</a></li> </ul>	<p><a href="#">Install XAMPP</a> on your laptops, if you are using a laptop. <a href="#">Configure PHPMyAdmin</a>, (<a href="#">possible issues</a>), (You can use any WAMP, MAMP or LAMP stack, or you can use a VM on Guacamole if you request one. But I have supplied instructions to XAMPP, which works on Windows and Mac. Check the orientation assignments on Canvas.) Test your installation as per instructions on Canvas.</p> <p>You may also want to install <a href="#">SublimeText</a>, <a href="#">atom</a>, <a href="#">BBEdit</a> (or <a href="#">any good text editor</a>) on the mac, or <a href="#">Notepad++</a> on Windows</p> <p>Assign: <a href="#">Homework #1</a></p> <p>Orientation: Available on Canvas. Best to complete before the course begins.</p>
2	10/21	<p><b>EER Diagrams</b></p> <ul style="list-style-type: none"> <li>Chapter 3: continue ER Examples: EN 3.21, 3.23, 3.32, 3.33, 3.34</li> <li>Chapter 4: EER Diagrams: Examples <a href="#">PPTs</a></li> <li><a href="#">Requirements Definition</a></li> <li>possibly begin Chapter 9</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">3.21</a>, <a href="#">3.23</a>, <a href="#">3.32</a>, <a href="#">3.33</a>, <a href="#">3.34</a></li> <li><a href="#">Chapter 4 PPT video</a> goes along with the <a href="#">PPTs</a> (It says Ch. 8, but ignore that)</li> <li><a href="#">Requirements Analysis</a></li> <li><a href="#">HW #2 Discussion</a></li> </ul>	<p><b>Due:</b> <a href="#">Homework #1</a></p> <p>Assign: <a href="#">Homework #2</a> (use <a href="#">EER case</a>) resolve any installation issues on stack</p>
3	10/28	<p><b>Map to Relations; SQL Lab</b></p> <ul style="list-style-type: none"> <li><b>Chapter 9:</b> mapping ERDs to relations (<a href="#">PPT Slides 12-23</a>) revisit the Supplier-Parts example</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Ch. 9 PPT Video</a></li> <li><a href="#">Ch. 5 PPT Video</a></li> <li><a href="#">Lab 1 Setup and DDL</a></li> </ul>	<p><b>Due:</b> Orientation Tasks</p> <p><b>Due:</b> <a href="#">Homework #2</a></p> <p>Assign: <a href="#">Homework #3</a></p>

		<ul style="list-style-type: none"> <li>• <b>Chapter 5:</b> relational model (formalize what you already know by now) and begin SQL (<a href="#">PPT slides</a>)</li> </ul> <p>Simple SQL Queries (<b>based on Chapter 6</b>, but modified for MySQL)</p> <ul style="list-style-type: none"> <li>• <a href="#">Lab #1</a>: see <a href="#">Company Schema</a> using <a href="#">DDL</a> and <a href="#">Insert</a> to create and populate the database</li> <li>• useful links: <a href="#">copy and rename a DB in PHPMyAdmin</a> and <a href="#">mysqldbcopy</a> or <a href="#">mysqldump</a> for command line</li> <li>• <a href="#">Create and populate the Pine Valley database</a> (ERD link).</li> <li>• <a href="#">LoadBigData for Pine Valley</a>, if instructed by video</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Lab 1: Q1, Q2, Q3</a> parts of video misaligned, but still readable</li> <li>• <a href="#">Lab 1: Q4 – Q8</a></li> <li>• <a href="#">Lab 1: Q9 – Q12</a></li> <li>• <a href="#">Lab 1: Q14 – Q18</a></li> <li>• <a href="#">Lab 1: Q19 – Q23</a></li> <li>• <a href="#">Lab 1: Q24 – Q25</a></li> <li>• <a href="#">HW #3 Instructions</a></li> </ul>	<p><a href="#">Lab #1</a>: show me or TA at end of class</p>
4	11/04	<ul style="list-style-type: none"> <li>• <b>Chapter 14: sections 14.1-14.4</b>, normalization and functional dependencies, brief overview <a href="#">PPTs</a></li> <li>• <a href="#">Lab #2</a>: More complex SQL Queries (<b>based on Chapter 7</b>, perhaps with some extra examples) user PVFC Big Version <a href="#">DDL</a>, <a href="#">data1</a></li> </ul>	<ul style="list-style-type: none"> <li>• 4.1: <a href="#">Design Guidelines4</a></li> <li>• 4.2: <a href="#">FDs and Keys</a></li> <li>• 4.3: <a href="#">PPT Normalization</a></li> <li>• 4.4: <a href="#">Normalization Example</a></li> <li>• 4.5: <a href="#">Semantic Reconciliation</a></li> <li>• 4.6: <a href="#">Equi-Natural-Joins</a></li> <li>• 4.7: <a href="#">Outer Joins</a></li> <li>• 4.8: <a href="#">Big Join</a></li> <li>• 4.9: <a href="#">Self Join</a></li> <li>• 4.10: <a href="#">Subquery</a></li> <li>• 4.11: <a href="#">Correlated Subquery</a></li> <li>• 4.12: <a href="#">Derived Tables</a></li> </ul>	<p><b>Due :</b> <a href="#">Homework #3</a> <a href="#">Lab #2</a>: show me or TA at end of class Assign: <a href="#">Homework #4</a> <a href="#">Hints for HW4</a></p> <p>DUE: Python Orientation Tasks</p>
5	11/11	Exam ( <a href="#">Midterm Review</a> ) This is a take-home exam. Take at the beginning of the week, because you also have a regular week of course content to complete—the first week of Module #2, below!!		<b>Due:</b> <a href="#">Homework #4</a>
<p><b>Module #2: Database Web Application, using Python, Flask, mysqlAlchemy</b>  <i>Before beginning this module, please download <a href="#">Python-DB-Lectures-Labs.zip</a>. It includes an entire directory structure with the files that you need for this Module. I reference the appropriate files (with its file path) for each lecture/lab listed below.  Videos will be linked to individually (not as a zip file)  In general, find the files listed in the Topics column, and let the videos guide you as to what to look at or do.</i></p>				
5	11/11	<p>Intro and Setup for the web application</p> <ul style="list-style-type: none"> <li>• Reference: Setup and Code from original video (totally optional!): <ul style="list-style-type: none"> <li>○ Code: DemoApps/01-GettingStarted</li> </ul> </li> <li>• Lecture: Review Setup and Code for getting started: <ul style="list-style-type: none"> <li>○ FlaskDemoLectures/GettingStarted (follow video with <a href="#">PPTs</a>) You are not required to submit anything for this part, but if you follow along, this will get you up and running in Flask.</li> </ul> </li> <li>• Review Lab Instructions for Setup (should have completed during Orientation. I listed this for review and reference.) <ul style="list-style-type: none"> <li>○ LabInstructions/1-Setup.pdf (not required to submit now)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Overview</a></li> <li>• <a href="#">1-Flask-Hello-World</a></li> </ul>	<p><a href="#">Python-Setup Lab</a> (does not have to be submitted now. It should have been completed during Orientation.) All Python and Flask orientation assignments are due on 10/6 at 11:55 p.m.</p>

		<p>Using Templates in Flask</p> <ul style="list-style-type: none"> <li>For reference: Code from Original Application <ul style="list-style-type: none"> <li>Code: DemoApps/02-Templates</li> </ul> </li> <li>Lecture: FlaskDemoLectures/02-Templates (follow video)</li> <li>In-class lab assignment: LabInstructions/Lab-1-2-Templates.pdf</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">02-Templates</a></li> </ul>	<a href="#">Python Lab 1-2: Templates</a>
6	11/18	<p>Creating and using Forms:</p> <ul style="list-style-type: none"> <li>For reference: Code from Original Application <ul style="list-style-type: none"> <li>Code: DemoApps/03-Forms-Validation-Final</li> </ul> </li> <li>Lecture: FlaskDemoLectures/03-Forms (follow video) <ul style="list-style-type: none"> <li>In-class lab assignment: LabInstructions/Lab-3-Forms.pdf</li> </ul> </li> </ul>	<a href="#">03-Forms</a>	<a href="#">Python Lab 3 Forms</a> Due: If Labs-1-2 templates was not completed in class last week, it is due now. I will confirm in class.
7	11/25	<p>Python connecting to a database.</p> <ul style="list-style-type: none"> <li>First we cover simple connections, non-flask connections, and basic flask connections, not from our DemoApp. <ul style="list-style-type: none"> <li>Watch the video lab-connect-db</li> </ul> </li> <li>Complete <a href="#">Lab4-a</a> before coming to class. <ul style="list-style-type: none"> <li>LabInstructions/Lab-4a-db-connect.pdf, using the files in the folder LAB-connect-db. Complete the parts in red.</li> </ul> </li> <li>We will review Lab-4a, and we will discuss <a href="#">Lab 4-b</a>, and maybe start on it.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">04a-lab-connect-db</a></li> <li><a href="#">04-DB</a> (lecture on the DemoApp)</li> </ul>	Due: If Lab 3 Forms was not completed in class last week, it is due now. I will confirm in class DUE: <a href="#">Lab 4a-connect-db</a> .
8	12/02	<p><b>There is over an hour's worth of videos to watch before coming to class!! Please come to class prepared!!!</b></p> <p>Crud on your database, going way beyond the DemoApp original app</p> <ul style="list-style-type: none"> <li>For reference: Code from Original Application <ul style="list-style-type: none"> <li>Code: DemoApps/04-Database</li> <li>Code: DemoApps/05-Packages</li> <li>Code: DemoApps/08-CRUD</li> </ul> </li> <li>Lecture: FlaskDemoLectures: (follow video 04-DB) This is just a lecture on the original code of the original videos. <ul style="list-style-type: none"> <li>Code: FlaskDemoLecture/04-DB</li> </ul> </li> <li>Lecture: In the folder DemoAppLabs, we will look at ALL of the code in that folder. Each app is a slight variation or improvement over the previous apps <ul style="list-style-type: none"> <li>In-class lab (discussion, no submission): <a href="#">LabInstructions/Lab-4b-db-connect-CrUD.pdf</a>. The lab instructions tell you exactly when to look at which project's code.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><a href="#">04-DB</a> (lecture on the DemoApp)</li> <li><a href="#">04-DB-trySQL</a></li> <li><a href="#">05-Packages-try-ORM-model-reflect</a></li> <li><a href="#">08-CrUD-Choices</a></li> <li><a href="#">08-CrUD-Update-Delete-New</a></li> </ul>	
9	12/09	<ul style="list-style-type: none"> <li>Catch-up, continue on Lab 4-b, discuss Project</li> <li>Culminating assignment on Module #2: <a href="#">Lab 4-c</a>. LabInstructions/Lab-4c-big-lab</li> </ul>		<a href="#">Lab-4-b</a> we will discuss together in class. This is not an assignment. No submission. Yet, you still have to do it. Wow. <a href="#">Lab-4-c due 12/09 at 11:55 p.m.</a>

<b>Module #3: Querying MongoDB</b> <i>Before beginning this module, please download <a href="#">MongoDB-Lectures-Labs.zip</a>. I reference the appropriate files (with its file path) for each lecture/lab listed below.  Videos will be linked to individually (not as a zip file). In general, find the files listed in the Topics column, and let the videos guide you as to what to look at or do. Also download the <a href="#">jupyter notebooks</a> that you will using for this part of the course. Place that folder in your MongoDB application folder for this course (my videos show mine as being Documents →mongodb-analytics, but you may have yours stored elsewhere).</i>			
10	12/16	Setup and Basic Querying: Lecture (watch the four lecture videos before class!!): <ul style="list-style-type: none"> <li>• Make sure that you have completed the <a href="#">Mongo Orientation</a></li> <li>• Lecture: Follow the directions in the four lecture videos. It is strongly recommended that you duplicate the work shown in the videos.</li> </ul>	<a href="#">1-MDB-Atlas-Cluster</a> <a href="#">2-MDB-Import-Movies_initial</a> <a href="#">3-Install Compass</a> <a href="#">4-Connect-to-Atlas</a>
		<ul style="list-style-type: none"> <li>• Lab: Complete MongoDB-Lectures-Labs/<a href="#">MDB-Lab-1a.pdf</a> <ul style="list-style-type: none"> <li>○ Complete the questions answered in red, and submit</li> </ul> </li> <li>• Lab: Complete MongoDB-Lectures-Labs/<a href="#">MDB-Lab-1b.pdf</a> <ul style="list-style-type: none"> <li>○ Complete the questions answered in red, and submit the answers, and the screenshots as specified in the videos.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">Lab-1-b-First Query</a></li> <li>• <a href="#">Lab-1-b-create-text-index</a></li> </ul> Due: <a href="#">Mongo Lab-1a</a> , <a href="#">Lab-1-b</a>
11	12/23	<ul style="list-style-type: none"> <li>• Project Overview (<a href="#">Requirements</a>). <a href="#">Presentation Guidelines</a>.</li> </ul>	
12	12/30	Labs: MongoDB-Lecture-Labs/ <a href="#">Lab-2-a-b-c-Student</a> . Submit the required screenshots from Lab2a and Lab 2b.  Hopefully, we'll have some time for a project check. If not, we'll have team zoom meetings.	<ul style="list-style-type: none"> <li>• <a href="#">5-Aggregation Framework</a></li> <li>• <a href="#">6-Filtering</a></li> <li>• <a href="#">7-local-trips</a></li> <li>• <a href="#">8-Project-reshape</a></li> <li>• <a href="#">9-UpdatingDocuments</a></li> <li>• <a href="#">10-Data-Types</a></li> </ul>
			<a href="#">Lab-2a-2b</a> There is no assignment submission for Lab 2c. Yet, you will need it. You get to do it for no points!
13	1/06	Lab 3: Open the notebook as specified in the lab instructions: LabInstructions/ <a href="#">Lab-3-student</a> Complete the missing cells in the notebook Submit the screenshots of the completed cells	<ul style="list-style-type: none"> <li>• <a href="#">11-FilteringOnArrayFields</a></li> <li>• <a href="#">12-elemMatch</a></li> </ul>
		No lab for these topics	<ul style="list-style-type: none"> <li>• <a href="#">13-GeoSpatial</a></li> <li>• <a href="#">14-Graphics</a></li> </ul>
14	1/13	Project Presentations	To be discussed in class