

Introduction to Database Systems: CS305

Oliver Bonham-Carter
Hang Zhao

29 August 2023

Meeting Time

Please read the syllabus before next class!!

Introduction
to Database
Systems:
CS305

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Introduction
to Class
Instructor's
Office Hours

Syllabus

Overview

Consider this!

Lecture, Discussion, Presentations, and Group Work:

T/Th 9:30 AM - 10:45 AM

8/29/2023 - 12/19/2023

Alden Hall, 101 Lecture

Laboratory Session:

Th 2:30 PM - 4:20 PM

8/29/2023 - 12/19/2023

Alden Hall, 101 Lab

Calendar

Meeting times

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Consider this!

<p>September</p> <p>29 30 31</p> <p>1 2 3</p> <p>4 5 6 7 8 9 10</p> <p>11 12 13 14 15 16 17</p> <p>18 19 20 21 22 23 24</p> <p>25 26 27 28 29 30</p>	<p>October</p> <p>1</p> <p>2 3 4 5 6 7 8</p> <p>9 10 11 12 13 14 15</p> <p>16 17 18 19 20 21 22</p> <p>23 24 25 26 27 28 29</p> <p>30 31</p>
<p>November</p> <p>1 2 3 4 5</p> <p>6 7 8 9 10 11 12</p> <p>13 14 15 16 17 18 19</p> <p>20 21 22 23 24 25 26</p> <p>27 28 29 30</p>	<p>December</p> <p>1 2 3</p> <p>4 5 6 7 8 9 10</p> <p>11 12 13 14 15 16 17</p> <p>18 19 20 21 22 23 24</p> <p>25 26 27 28 29 30 31</p>

Google Calendar Clickable Link

Course Calendar URL

Instructor's Office Hours

Please make an appointment first!

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Consider this!

Dr. Bonham-Carter

- Monday: 11am - 12pm, 2pm - 4pm (10 minute time slots)
- Tuesday: 2pm - 4pm (10 minute time slots)
- Friday: 11am - 12 (10 minute time slots)
- By appointment

Office Hours Appointment link

OBC's Office Hours Appointment Slots

To schedule a meeting with me during my office hours, please visit my Web site and click the "Schedule" link in the top right-hand corner. Now, you can view my calendar or by clicking "schedule an appointment" link browse my office hours and schedule an appointment by clicking the correct link to reserve an open time slot.

Instructor's Office Hours

Please make an appointment first!

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Consider this!

Dr. Hang Zhao

- Wednesday and Friday: 9am - 11pm, Quigley 118
- Thursday: 10:55am - 12:10pm, Alden 104
- By appointment

Office Hours Appointment link

HK's Office Hours Appointment Slots

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Consider this!

[My Classes](#)

[Contact and About](#)

[Just For Fun](#)

[Portfolio](#)

[Projects](#)

[Resources](#)

[iTea](#)

[OutReach](#)

Office Hours

To be sure that I have enough time with each person during my office hours, I ask that you please schedule an appointment. If the offered times are not convenient for you, other arrangements can be made to meet (in-person and online).

[Schedule an office hours appointment](#)

- **Main website:**
<http://www.cs.allegheny.edu/sites/obonhamcarter/>
- **Course webpage:**
<https://www.oliverbonhamcarter.com/classes/databasesystems/databasesystems/>
- **Office hours:**
<https://www.oliverbonhamcarter.com/contactandabout/>

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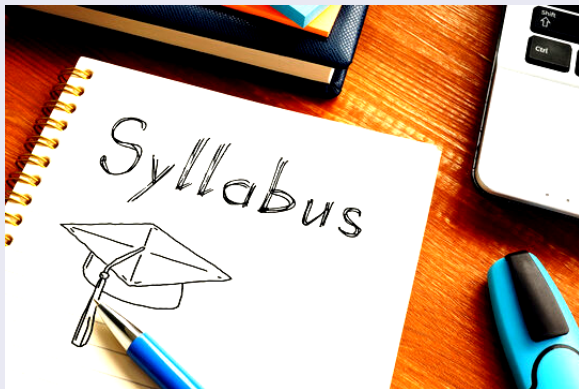
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Consider this!



Let's take moment check out the syllabus...

Syllabus

Textbook

Introduction
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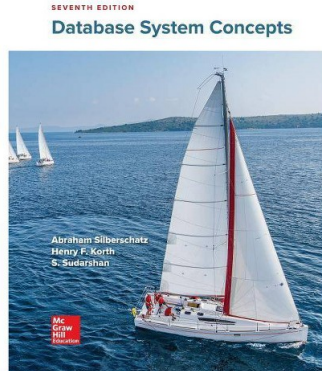
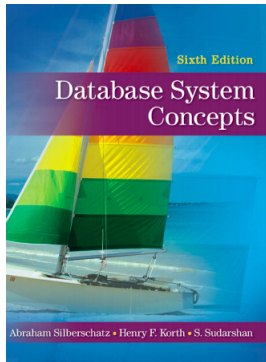
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Consider this!



- Database Systems Concepts, *sixth or seventh Edition*.
Avi Silberschatz, Henry F. Korth, and S. Sudarshan.

Course Overview

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Overview

Consider this!

- Database systems
- Data models and schemas
- Database design and implementation
- SQL programming
- Python for automatic queries, Streamlit
- XML
- Object-based databases
- Data Warehousing and Mining
- Distributed Databases
- NoSQL databases (i.e., MongoDB, Neo4j)
- And more!!

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Consider this!

So, What is a Database??

Some Ideas...

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Consider this!

Definitions...

- *"A set of information held in a computer"* - Oxford English Dictionary
- *"One or more large structured sets of persistent data, usually associated with software to update and query the data"* - Free On-Line Dictionary of Computing
- *"A collection of data arranged for ease and speed of search and retrieval"* -Dictionary.com

Database Systems

Lots of technologies!

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Overview

Consider this!



BOARD

- Working with data
 - Storing, Updating, Retrieving, Organizing, Security
 - Click to read more!

Database Systems

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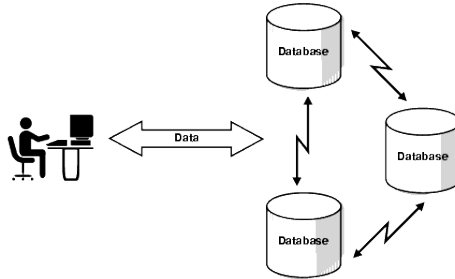
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Consider this!



- A database system consists of ...
 - Data and Container Design
 - Software and its Hardware
 - Users (do not forget this part!)
 - Implementation of the above
- (We will focus mainly on the design, software and programming)

Let's Discuss...

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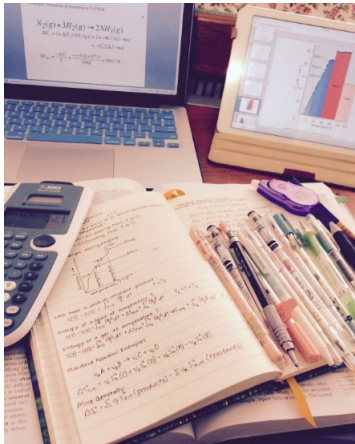
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Consider this!



So, why study database systems??

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Consider this!



- Databases are useful
 - Many computing applications deal with large amounts of information
 - Database systems give a set of tools for storing, searching and managing this information
- Databases in CS
 - Databases are a core topic in computer science
 - Basic concepts and skills with database systems are part of the skill set you will be assumed to have as a CS graduate

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Consider this!

Database Administrator salaries in United States

\$94,769 per year ?

Based on 5,145 salaries



**Database Administrator salaries by company in
United States**

<https://www.indeed.com/q-Database-jobs.html>

<https://www.computerscience.org/careers/database-administrator/>

Careers II

The top ten according to NorthEastern.edu

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Consider this!

Careers with Data and Databases

- 10) **Data Analyst** Annual Salary Range: \$77,500-\$118,750
Increase in Salary Over the Last Year: 3.8 percent
- 9) **Database Administrator** Annual Salary Range:
\$98,500-\$148,500 Increase in Salary Over the Last Year: 3.6
percent
- 8) **Database Developer** Annual Salary Range:
\$108,000-\$161,500 Increase in Salary Over the Last Year: 5.1
percentone of the top-three highest increases
- 7) **Data Modeler** Annual Salary Range: \$111,000-\$161,500
Increase in Salary Over the Last Year: 3.9 percent
- 6) **Data Scientist** Annual Salary Range: \$116,000-\$163,500
Increase in Salary Over the Last Year: 6.4 percentthe highest
increase of all data science jobs

<https://www.northeastern.edu/graduate/blog/highest-paying-big-data-careers/>

- 5) **Business Intelligence Analyst** Annual Salary Range: \$118,000-\$171,500 Increase in Salary Over the Last Year: 4.3 percent
- 4) **Database Manager** Annual Salary Range: \$122,250-\$177,000 Increase in Salary Over the Last Year: 3.7 percent
- 3) **Data Warehouse Manager** Annual Salary Range: \$129,000-\$179,000 Increase in Salary Over the Last Year: 4.1 percent
- 2) **Data Architect** Annual Salary Range: \$131,250-\$184,000 Increase in Salary Over the Last Year: 4.1 percent
- 1) **Big Data Engineer** Annual Salary Range: \$135,000-\$196,000 Increase in Salary Over the Last Year: 5.8 percentthe second-highest salary increase