

Course Syllabus

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A PDF copy of this syllabus is available at [syllabus.pdf](#) 

About

In this class you will have the opportunity to learn the basic skills needed to

1. design and implement a simple to moderately complex database,
2. make good decisions regarding database design, and
3. document your design and queries in standardized notation.

Additionally, you will have the opportunity to practice these skills by building a simple website driven by a database backend.

Measurable Student Learning Outcomes:

At the completion of the course, students will be able to...

1. Describe the difference between a relational database and a flat file (Level 1; ABET Outcomes: A, j)
2. Model a moderately complex data set by using an ER or UML diagram, and derive a relational schema from that diagram (Level 3; ABET Outcomes: A, b, C)
3. Create a relational database from a relational schema (Level 4; ABET Outcomes: A, K, c)
4. Create multiple indices in a relational database, and explain when and why such indices are appropriate (Level 5; ABET Outcomes: A, b, C)
5. Formulate SQL statements for data manipulation (Level 4; ABET Outcomes: A, c)
6. Formulate simple queries in relational algebra by using projection, selection, product, and join operations (Level 3; ABET Outcomes: A, I)
7. Describe the components and interfaces of a Web-based database system (Level 1; ABET Outcomes: A, B, I)
8. Design and implement a Web-based relational database system, using one or more scripting languages (e.g., PHP) and an open-source database development system (e.g., MySQL) (Level 4; ABET Outcomes: a, B, C, I, K)

Recommended books

Relational Database Design and Implementation by Jan L Harrington, 2016 Edition is the recommended textbook for CS340-400.

A rough mapping of the current weeks to the chapters of the book is given below

- Chapters 1,3 -- Week 1
- Chapters 4-5 -- Weeks 2-3
- Chapter 10,16-17, 19 -- Week 4
- Chapter 11 -- Week 5
- Chapters 7, 13-15 -- Week 6
- Chapter 6 -- Week 7

This book is available for free *online* for all the OSU students at the [OSU Library](https://alliance-primo.hosted.exlibrisgroup.com/primo-explore/fulldisplay?docid=CP71248352730001451&context=L&vid=OSU) [\(https://alliance-primo.hosted.exlibrisgroup.com/primo-explore/fulldisplay?docid=CP71248352730001451&context=L&vid=OSU\)](https://alliance-primo.hosted.exlibrisgroup.com/primo-explore/fulldisplay?docid=CP71248352730001451&context=L&vid=OSU)

If you decide to use Python for web development in this course, the [Flask user guide](http://flask.pocoo.org/docs/1.0/) [\(http://flask.pocoo.org/docs/1.0/\)](http://flask.pocoo.org/docs/1.0/) should be good enough.

If you decide to use node.js for web development in this course, recommended books from CS 290 should suffice.

Course Content

This course is dedicated to learning the basics of database design and use.

To accomplish this, along with 4 assignments you will work in groups on a term Project implementing the concepts that you learn each week.

There will also be small quizzes which will help you assess your own understanding of the material. With few exceptions, if you ever get a wrong answer on a quiz that means you are not understanding critical information and it is your responsibility to get clarification. I hope you will not hesitate to ask a question on Piazza if this happens!

All the content, assignments, quizzes and project steps will be available in weekly Modules.

Expectations from Student

Prior Knowledge

Students are expected to know the following:

You should be familiar with good coding practices. Good coding style is required and not taught in this class. You should understand basic control structures. If you are unable to code a simple sorting algorithm, you will have trouble in this class as this level of coding experience is expected.

You should also have completed 290 or be a strong student currently taking the course. It is possible to take these two courses at the same time, but if you run into difficulty in 290 you can have some real trouble late in this course, so do that with some caution.

Code quality

Code must be clear and you must understand what it is doing. Having well-documented code is going to be extremely important. I or the TA may not know the platform you are using, so it is your responsibility to make sure that your work is clear enough so that we can follow what is happening.

You should also have no major errors in your program. If we can manage to get the program to throw some default error message that is usually a major issue. Errors which you handle via a clear message to the user (e.g. 'Please enter only numbers in the age field') are usually fine. On the other hand, error messages like 'Error 0x00001: Null pointer to Null found, expected pointer to Int Factory Factory' are not.

When possible, you should find a style guide and conform to it.

Expectations for Student Conduct

Student conduct is governed by the university's policies, as explained in the [Student Conduct Code](http://studentlife.oregonstate.edu/code) (<http://studentlife.oregonstate.edu/code>). Students are expected to conduct themselves in the course (e.g., on discussion boards, email postings) in compliance with the university's regulations regarding civility.

About the Instructor



Hi, I am Dr. Michael Curry and will be your instructor this term. I am teaching this course with fellow instructor and Database expert Danielle Safonte. Catch her on Slack and Piazza!

I live in Portland Oregon area and have been a professor on campus at Oregon State and now online.

I didn't plan to become a computer scientist, but maybe like you I had a bit of a knack for it and kind of enjoyed doing things that required writing little programs. After college I was a telecommunications officer in the US Army and really didn't write code, but later I went to graduate school and got a job as a software engineer. I initially wrote software for embedded systems but what I didn't like about that was how hard it was to update an embedded system.

So instead I started writing software for the web and I have always liked the interactive nature of the web and especially how easily the code can be updated on the server. I enjoyed it so much I started my own company in 2003 and over the next 12 years worked with over 100 different businesses which was really rewarding to help my clients by writing web software, managing their data and solving problems.

I have been working with databases and writing web code for over 15 years, but importantly for you I have also been fortunate enough to teach this material to students such as yourselves for over 10 years too. And I really enjoy helping others learn. In fact my motto is "when you learn I win". So if you're stuck and having difficulty then I am losing! So don't hesitate to reach out to me in Slack, Piazza or by email.

Outside of work, I am an avid rock climber and love being outdoors. I look forward to connecting with you and helping you learn this term.

Student Evaluation of Courses

















The online Student Evaluation of Teaching system opens to students during the week before finals and closes the Monday following the end of finals. Students receive notification, instructions and the link through their ONID. They may also log into the system via Online Services. Course evaluation results are extremely important and used to help improve courses and the online learning experience for future students. Responses are anonymous (unless a student chooses to “sign” their comments, agreeing to relinquish anonymity) and unavailable to instructors until after grades have been posted. The results of scaled questions and signed comments go to both the instructor and their unit head/supervisor. Anonymous (unsigned) comments go to the instructor only.



Week	Topic & Content	Due Mon	Due Thurs
1	Intro/Tools		(Syllabus Quiz)
2	Relational DB & Design	Task 0 Quiz 1	Step 0 Assignment 0
3	Models, Diagrams, Schemas	Project Step 1 Final (Proposal and Outline)	
4	SQL (DML)	Project Step 2 Draft (ERD Schema) Quiz 2	Project Step 2 Review
5	SQL, Advanced DML, DDL	Project Step 2 Final (ERD Schema) Quiz 3	Advanced SQL Assignment
6	ER to DDL	Project Step 3 Draft (HTML Interface) Quiz 4	Project Step 3 Review
7	Relational Algebra	Project Step 3 Final (HTML Interface) Quiz 5	Transactions EC
8	Project, ORMs	Project Step 4 Draft (DML + DDL)	Project Step 4 Review Relational Algebra Assignment
9	Non-relational Databases, Stored	Project Step 5(CREATE + READ) Draft	Project Step 5 Review

	Procedures, and Triggers		
10	Dead Week	Project Step 6(CREATE + READ) Draft	Project Step 6 Review
(11)	Finals Week	Reflection EC	Project Step 7 FINAL final

Course Summary:

Date	Details
Mon Jan 13, 2020	 Quiz 0: Syllabus Quiz https://oregonstate.instructure.com/courses/1750814/assignments/7773009 due by 11:59pm
	 Task 0: Form your Project Group https://oregonstate.instructure.com/courses/1750814/assignments/7773038 due by 11:59pm
Thu Jan 16, 2020	 Quiz 1: Databases & ERD https://oregonstate.instructure.com/courses/1750814/assignments/7773013 due by 11:59pm
	 Assignment 0: Access and Use the CS340 Database https://oregonstate.instructure.com/courses/1750814/assignments/7773017 due by 11:59pm
	 Project Step 0: Connect webapp to database https://oregonstate.instructure.com/courses/1750814/assignments/7773020 due by 11:59pm
Mon Jan 20, 2020	 Project Step 1: Project Proposal and Outline https://oregonstate.instructure.com/courses/1750814/assignments/7773021 due by 11:59pm
Mon Jan 27, 2020	 Quiz 2: Using ERD & Schema https://oregonstate.instructure.com/courses/1750814/assignments/7773011 due by 11:59pm
Thu Jan 30, 2020	 Project Step 2 Review https://oregonstate.instructure.com/courses/1750814/assignments/7773024 due by 11:59pm
Mon Feb 3, 2020	 Project Step 2 Final Version: ERD & Schema https://oregonstate.instructure.com/courses/1750814/assignments/7773023 due by 11:59pm
	 Quiz 3: Basic SQL (On Gradescope) https://oregonstate.instructure.com/courses/1750814/assignments/7773035 due by 11:59pm

Date	Details	due by 11:59pm
Thu Feb 6, 2020	 Advanced SQL Assignment Part A (on GradeScope) (INTEGRATE WITH GRADESCOPE BEFORE PUBLISHING) (https://oregonstate.instructure.com/courses/1750814/assignments/7773015)	due by 11:59pm
	 Advanced SQL Assignment Part B (on GradeScope) (INTEGRATE WITH GRADESCOPE BEFORE PUBLISHING) (https://oregonstate.instructure.com/courses/1750814/assignments/7773016)	due by 11:59pm
	 Project Step 3 Review (https://oregonstate.instructure.com/courses/1750814/assignments/7773027)	due by 11:59pm
Mon Feb 10, 2020	 Quiz 4 Advanced SQL (https://oregonstate.instructure.com/courses/1750814/assignments/7773012)	due by 11:59pm
	 Project Step 3 Draft Version: Design HTML Interface (https://oregonstate.instructure.com/courses/1750814/assignments/7773025)	due by 11:59pm
Thu Feb 13, 2020	 Extra Credit: Transactions in databases (https://oregonstate.instructure.com/courses/1750814/assignments/7773018)	due by 11:59pm
Mon Feb 17, 2020	 Quiz 5: Relational Algebra Quiz (https://oregonstate.instructure.com/courses/1750814/assignments/7773010)	due by 11:59pm
	 Project Step 3 Final Version: Design HTML Interface (https://oregonstate.instructure.com/courses/1750814/assignments/7773026)	due by 11:59pm
Mon Feb 24, 2020	 Project Step 4 Draft Version: DML and DDL Queries (https://oregonstate.instructure.com/courses/1750814/assignments/7773028)	due by 11:59pm
Thu Feb 27, 2020	 Project Step 4 Review (https://oregonstate.instructure.com/courses/1750814/assignments/7773029)	due by 11:59pm
	 Relational Algebra Assignment (https://oregonstate.instructure.com/courses/1750814/assignments/7773037)	due by 11:59pm
Mon Mar 2, 2020	 Project Step 5 Draft Version: Implement CREATE + READ operations (https://oregonstate.instructure.com/courses/1750814/assignments/7773030)	due by 11:59pm
Thu Mar 5, 2020	 Project Step 5 Review (https://oregonstate.instructure.com/courses/1750814/assignments/7773031)	due by 11:59pm
Mon Mar 9, 2020	 Group Reflection on various teaching strategies used in CS340 (https://oregonstate.instructure.com/courses/1750814/assignments/7773014)	due by 11:59pm
	 Project Step 6 Draft Version: Implement UPDATE and DELETE operations (https://oregonstate.instructure.com/courses/1750814/assignments/7773032)	due by 11:59pm
Thu Mar 12, 2020	 Project Step 6 Review (https://oregonstate.instructure.com/courses/1750814/assignments/7773033)	due by 11:59pm

Date	Details	
Thu Mar 19, 2020	 <u>Project Step 7 (Portfolio Assignment)</u> <u> (https://oregonstate.instructure.com/courses/1750814/assignments/7773034)</u>	due by 11:59pm
Mon Mar 30, 2020	 <u>Project Step 2 Draft Version: ERD & Schema</u> <u> (https://oregonstate.instructure.com/courses/1750814/assignments/7773022)</u>	due by 11:59pm