**University of Michigan School of Information**

**Database Application Design**

**Syllabus**

Instructor: Charles Severance <csev@umich.edu>

Office hours: Fridays 2-4PM, 3373 North QUad

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Website: https://umich.instructure.com/courses/173159

Course Materials: [https://www.wa4e.com](http://www.php-intro.com/)

**Course Description**

This course is an introduction to database management systems (DBMS). It covers both theoretical and practical aspects of DBMS, including database design, use, and implementation using the database language SQL. Students use the open-source MySQL database and the PHP scripting language for Web development throughout the course.

**Pre-Requisites**

Students should be familiar with the material covered in SI502 and SI539 (HTML, CSS, Programming, HTTP, etc) either through taking these courses or from other experience. Students who have no experience with programming, HTML, or CSS will find the first few weeks of this course taxing. Unless you have prior experience, I do not recommend taking this course in the same semester as you are taking a first programming course.

**Learning Objectives**

The purpose of this course is to provide students with all necessary skills for building and deploying database-backed web sites. The Learning Objectives for this course are to help students develop solid competency in:

* Be skilled in Structured Query Language (SQL)
* Understand the relationship between a DBMS and the physical database and applications systems.
* Understand and explain the benefits of the relational model and normalization
* Analyze unstructured problems and design data models
* Transform data models into database designs
* Be skilled in the PHP programming language
* Be able to build JSON based APIs and use them in web applications
* Be able to use JavaScript libraries like jQuery

**Course Textbook**

**The Missing Link: An Introduction to Web Development and Programming**

Author: Michael Mendez

ISBN-10: 1502447967

ISBN-13: 978-1502447968

This book is a free/open textbook. All electronic formats (PDF/EPUB) are freely available at

http://textbooks.opensuny.org/the-missing-link-an-introduction-to-web-development-and-programming/

You can purchase a print copy from that Web site at Amazon.

**Lecture Materials and Sample Code**

Lecture slides and sample code can be downloaded from the web site

http://www.wa4e.com/

You can download the materials well in advance of class to study before lecture but there will be small updates to the materials for each lecture right before the lecture so you may need to re-download a copy of the materials right before lecture.

**Course Outline**

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| --- | --- | --- | --- | --- |
| **WEEK** | **Date** | **LECTURE TOPIC** | **Assignment** | **Lessons (WA4E)** |
| 1 | September 7 | HTML, CSS, HTTP | Request-Response | 1-4 |
| 2 | September 14 | Expressions, Arrays, Logic | Guess | 5-6 |
| 3 | September 22 | Functions, Forms, and Validation | Hash / RPS | 7-8 |
| 4 | September 28 | Single Table SQL | Users DB | 9 |
| 5 | October 5 | Multi-Table SQL | Tracks DB | 10 |
| 6 | October 12 | PHP Objects, PHP + SQL | Autos DB | 11, 12 |
| 7 | October 19 | Written Midterm |  |  |
| 8 | October 26 | Sessions, Redirect, Login | User DB+Login | 13, 14 |
| 9 | November 2 | CRUD Applications | Autos CRUD | 15 |
| 10 | November 9 | JavaScript | Profile CRUD/JS | 16 |
| 11 | November 16 | Objects / JQuery | Positions / JQuery | 17,18 |
|  | November 23 | Thanksgiving (no lectures or discussions) |  |  |
| 12 | November 30 | Ajax / JSON / Many-Many | Education / JSON | 19 |
| 13 | December 7 | Practical Exam |  |  |

Note: Schedule, topics, and assignments may be changed/adjusted as the semester progresses.

**Late Policy**

Late assignments will be penalized by 20% times the number of days late. Homework that is 5 days or more late will receive zero credit.

**Homework**

Throughout the course there will be one or more weekly programming assignment that will be a PHP / MySQL application to be developed and turned in. Most weeks there will also be an online quiz. Some weeks will have more than one assignment due. Students should carefully monitor the "Modules" tab in the course Canvas site to make sure not to miss any assignments.

**Grading**

The graded work in the course will be weighted as follows to determine a final percentage grade:

Quizzes 10%

Programming Assignments 40%

Written Midterm 25%

Practical Exam 25%

Grades will be awarded as follows:

A 93% and above

A- 90% and above

B+ 87% and above

B 85% and above

B- 77% and above

C 73% and above

D 70% and above

F Below 70%

**Required Tools**

The software used for the course is 100% free. You will need a programmer text editor such as Atom as well as a PHP/MySql development environment. The simplest is to install one of the fully integrated all-in-one PHP/MySql packages such as MAMP, XAMPP, LAMP, or WAMP depending your operating system.

**Giving and Receiving Assistance**

Learning technical material can be challenging. We move quickly through a wide range of topics. Our goal is for you to succeed in the course, and we encourage you to get help from anyone you like, especially in the portion of the course before the midterm.

You may get help even in completion of assignments. However, you are responsible for learning the material, and you should make sure that the assistance you are getting is focused on gaining knowledge, not just on getting through the assignments. If you receive too much help and/or fail to master the material, you will crash and burn at the midterm you must perform on your own.

If you receive assistance on an assignment, please indicate the nature and the amount of assistance you received. If the assignment is computer code, add a comment crediting sources (as in any academic paper) or indicating who helped you and how.

If you are a more advanced student and are willing to help other students, please feel free to do so. Just remember that your goal is to help teach the material to the student receiving the help.

It is always appropriate to ask for and provide help on assignments via the course mailing list or during the optional labs.

**Academic Integrity**

***Collaboration***

UMSI strongly encourages collaboration while working on some assignments, such as homework problems and interpreting reading assignments as a general practice. Active learning is effective. Collaboration with other students in the course will be especially valuable in summarizing the reading materials and picking out the key concepts.You must, however, write your homework submission on your own, in your own words, before turning it in. If you worked with someone on the homework before writing it, you must list any and all collaborators on your written submission. Each course and each instructor may place restrictions on collaboration for any or all assignments. Read the instructions careful and request clarification about collaboration when in doubt. Collaboration is almost always forbidden for take-home and in class exams.  
  
**Plagiarism**

All written submissions must be your own, original work. Original work for narrative questions is not mere paraphrasing of someone else's completed answer: you must not share written answers with each other at all. At most, you should be working from notes you took while participating in a study session. Largely duplicate copies of the same assignment will receive an equal division of the total point score from the one piece of work.

You may incorporate selected excerpts, statements or phrases from publications by other authors, but they must be clearly marked as quotations and must be attributed. If you build on the ideas of prior authors, you must cite their work. You may obtain copy editing assistance, and you may discuss your ideas with others, but all substantive writing and ideas must be your own, or be explicitly attributed to another. See the (Doctoral, MSI, BSI) student handbooks available on the UMSI intranet for the definition of plagiarism, resources to help you avoid it, and the consequences for intentional or unintentional plagiarism.

**Accommodations for Students with Disabilities**

If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the as­signments, the in-class activities, and the way we teach may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Oﬃce of Services for Students with Disabilities (SSD) to help us determine appropriate accommoda­tions. SSD (734-763-3000; [ssd.umich.edu/)](http://ssd.umich.edu/) typically rec­ommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. I will treat any information that you provide in as confidential a manner as possible.

**Student Mental Health and Wellbeing**

The University of Michigan is committed to advancing the mental health and wellbeing of its students, while acknowledging that a variety of issues, such as strained relationships, increased anxiety, alcohol/drug problems, and depression, directly impacts students’ academic performance.  
  
If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help, contact Counseling and Psychological Services (CAPS) at (734) 764-8312 and https://caps.umich.edu/ during and after hours, on weekends and holidays or through its counselors physically located in schools on both North and Central Campus. You may also consult University Health Service (UHS) at (732) 764-8320 and https://www.uhs.umich.edu/mentalhealthsvcs, or for alcohol or drug concerns, see www.uhs.umich.edu/aodresources.  
  
For a more comprehensive listing of the broad range of mental health services available on campus, please visit: http://umich.edu/~mhealth/

**Credit where credit is due**

This course has evolved over the last few semesters with help from a number of people, and the course will continue to evolve this term and in future terms with the help of everyone involved in SI572/SI664. Colleen van Lent, Charles Antonelli, Xin Rong, Caitlin Holman, and students in prior semesters have all made contributions to materials and/or ideas used in this course.