


**UNIVERSITY OF MICHIGAN  SCHOOL OF INFORMATION**  
**SI 572: Database Application Design**  
**Syllabus**

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Term: Fall 2011  
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### **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. Some topics in physical database design are also discussed. An essential part of the course is a programming project through which students design and develop a practical database system for library access, electronic commerce, information retrieval, or a similar application. Students use the open-source MySQL database and the PHP scripting language for Web development throughout the course.

### **Pre-Requisites**

This course has no pre-requisites, but since it is a project-based programming course, we will move briskly through materials in the first few weeks of the course covering PHP programming and the MySQL database to insure that all students have the basic understanding around building applications so they can appropriately contribute to the group projects that count as the Practical Engagement (PEP) points for the course. 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 SI572 very challenging. Unless you have prior experience, I do not recommend taking SI572 in the same semester as either SI539 or SI502.

### **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 SI-572 are to help students develop solid competency in:

- Be skilled in the PHP programming language
- 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;
- Use a team approach to creating a working project that will utilize PHP and MySQL programming.

## Practical Engagement Program (PEP)

This course includes 2 PEP points because of the project aspect of the course.

<http://www.si.umich.edu/careers/pep-courses>

You should each expect to spend 120 hours on the project aspects of this course. This represents 10 or more hours per week outside of lecture including design, meeting with clients, development, discussion, preparing for presentations, etc. This work will be done as a group and is a significant commitment.

## Required Textbook

The textbook for the class will be:

### Learning PHP, MySQL, and JavaScript

Author: Robin Nixon.

ISBN-10: 0596157134

ISBN-13: 978-0596157135

<http://oreilly.com/catalog/9780596157142>

<http://www.amazon.com/Learning-MySQL-JavaScript-Step-Step/dp/0596157134>

## Course Outline

Because this is a PEP course, we spend the first four weeks covering the basics of PHP and MySQL to prepare you for the project portion of the course. You will take a timed practical midterm where you will develop a PHP and MySQL application as an individual during a three-hour lecture period.

WEEK	Week of	LECTURE TOPIC	REQUIRED READING
1	September 12	Intro to PHP Install MAMP, XMAMP, WAMP, or LAMP	Chapter 1,2,3
2	September 19	PHP Programming	Chapter 4, 5, 6, 7
3	September 26	Data Modeling and Table Structure	Chapter 8, 9
4	October 3	Manipulating the Database, Sessions	Chapter 10, 11, 12, 13
5	October 10	<i>Project Proposals</i>	
6	October 17	Fall Break	
7	October 24	Individual Practical Midterm Exam	
8	October 31	JavaScript / Ajax / JQuery	Chapter 14, 15, 16
9	November 7	TBD	
10	November 14	<i>Group Reports</i>	
11	November 21	Web Services	
12	November 28	TBD	
13	December 5	<i>Individual Group Demonstrations</i>	
14	December 12	<i>Student Presentations</i>	
	December 17	<i>Personal Reflection Due Online</i>	

Note: Schedule and topics may be changed as the semester progresses.

## Exams

The only exam for the class will be an in-class timed practical programming exercise. Given that the midterm is a significant fraction of the overall grade, if a student performs poorly on the midterm exam, it will limit the maximum grade the student can achieve in the course.

## Homework / Assignments

Throughout the course there will be structured individual assignments that correspond to the material covered in the lectures. These assignments will be a combination of programming tasks and/or short quizzes over the material from the lecture and the book. During the first third of the course, there will be 1-2 assignments per week. During the project phase there will be fewer individual assignments as the focus shifts to group work.

## Personal Reflection / Activity Journal

As part of the group activity, individuals will keep a log of their activities, accomplishments, contributions, and time spent on the PEP project for this course. The document should be a readable narrative and include both descriptive elements as well as reflective elements. Each student will turn in their journal after the class is complete at the beginning of the final exam period.

## Grading

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

Individual Assessments:	
Midterm Exam	30%
Assignments	20%
Group Activities:	
Presentations/Demonstrations	30%
Personal Reflection	20%

Grades will be awarded as follows:

A	93% and above
A-	90% and above
B+	87% and above
B	85% and above
B-	80% and above
C+	77% and above
C	73% and above
D	70% and above
F	Below 70%

A+ grades will be awarded solely at the discretion of the instructional staff based on a student's contribution to the course, overall quality of work and other factors. A student's overall percentage must be above 93% to be considered for an A+. There will be few A+ grades awarded.

## **Required Tools**

The software used for the course is 100% free. You will need a programmer text editor such as TextWrangler or NotePad++ 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, XMAMP, LAMP, or WAMP depending your operating system.

## **Using the Course Mailing List**

Much of the communication for the course will be handled through email. Students are expected to keep up with all email that comes to them from the course mailing list. The mailing list is also a place to get help in the class. It is completely acceptable for a student in the course to attempt to help other students over the mailing list. The instructional staff will read all mail and correct any incorrect advice that one student gives another. All students have permission to post to the mailing list. Asking (or answering) questions through the mailing list counts as "participation". Asking questions one-on-one (through email or in lab) does not.

## **Accommodations**

If you think you need an accommodation for a disability, please let me know at your earliest convenience, but as soon as possible. Some aspects of this course, the assignments, the in-class activities, and the way I 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; <http://www.umich.edu/~sswd/>) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. I will treat any information you provide as private and confidential.

## **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 all of 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 when all of a sudden 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.

## **Plagiarism**

At the University of Michigan and in professional settings generally, plagiarism is an extremely serious matter. All individual written submissions must be your own, original work, written entirely in your own words. You may incorporate excerpts from publications by other authors, but they must be clearly marked as quotations and properly attributed. You may obtain assistance with copyediting, and you may discuss your ideas with others, but all substantive writing and ideas must be your own unless explicitly attributed to another, using a citation sufficiently detailed for someone else to easily locate your source.

All cases of plagiarism will be officially reported and dealt with according to SI policies. There will be no warnings, no second chances, no opportunity to rewrite; all plagiarism cases will be immediately reported to SI's Dean of Academic Affairs. Consequences can range from failing the assignment (a grade of zero) or failing the course to expulsion from the University. For additional information about plagiarism, see the "Academic and Professional Integrity Policy Statement" in the SI Masters Student Handbook, the Rackham pamphlet on Academic Integrity, and the plagiarism document from the UM Libraries. If you have any doubts about whether you are using the words or ideas of others appropriately, please discuss them with the instructional staff of the course.

### **Success in the Course**

This course expects you to produce a significant group software project in about 10 weeks using PHP and MySQL. We spend some time at the beginning of the course giving you an overview of the core materials and skills you will be using in your projects but a large part of the effort will be your own self-directed and group learning outside of the lecture. We hope to give you a map of the material to help prepare you to be a self-learner, gathering materials from books, the web, and other people. Given the amount of self-directed learning that is expected, if you have no prior knowledge of programming, database, or the world-wide web, this course will likely be very frustrating. If you are looking for a more "normal" programming course that works through a book with lectures and assignments that closely follow a book, you should take SI502, SI539, or SI543. This course is about you creating software. With the right preparation, the open-ended nature of this course can be very exciting and rewarding.

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### **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 SI 572. Colleen van Lent, Charles Antonelli, and students in prior semesters have all made contributions to materials and/or ideas used in this course.