

INFM 747 - Web-Enabled Databases

Summer 2014 - Tentative Syllabus¹

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Office Hours:	By appointment

Class meeting time and place:

This is an asynchronous online class with **optional** online and/or face-to-face help sessions.

Catalog-type Description:

Basic methods and tools for developing dynamic, database-driven websites. Acquiring, installing and running web servers, database servers, and connectivity applications. Developing web interfaces, and application-layer components. Prerequisite: INFM 603, INST 630, LBSC 671, LBSC 690, or equivalent.

Extended Description:

Contemporary web applications go beyond plain HTML pages, providing interfaces to dynamic databases, and adding several other key functionalities to websites. These functionalities enrich the user experience, and facilitate porting of many information tasks to web environment. INFM 747 Web-Enabled Databases will introduce tools and methods for developing database driven websites. The course will introduce initial steps of building a dynamic website, such as installing and maintaining a web server and a database server, as well as developing web interfaces and server-side applications that provide added functionality to the website.

¹ **This syllabus is subject to change. Please check the course ELMS space frequently for updates.**

Learning Outcomes:

After completing this course the student will be able to:

- Understand the basic approaches and key development elements to building dynamic websites.
- Acquire, install and maintain a web server.
- Acquire, install and maintain a database server.
- Acquire, install and maintain applications that provide connectivity between different layers of the site architecture.
- Build basic web interfaces for communicating with underlying databases.
- Program basic application components that will add functionality to websites.

Elements of the Course:

Skill Level Self-Assessment and Course Plan Survey: Your first assignment (not-graded) in this course is to fill out the Skill Level Self-Assessment and Course Plan Survey on the Canvas (ELMS) site. You will provide your preferred email address for communications regarding this course, state your self-assessed skill level in server-side scripting and relational databases, and choose whether you want to follow a 12-week or a 6-week course plan. You should fill out and submit the survey by Wednesday, June 4th.

Modules: The course will be delivered as a sequence of modules on Canvas (ELMS), each of which will cover one or a few key skills in PHP scripting and database development and management on the MySQL database server. Each module will combine one or more learning components, such as videos, slideshows, example scripts, exercises and assignment. (Not all modules will involve all of these components.) Each module will have a due date by which it should be completed with all of its components, including assignments, if any. Students may choose to complete the modules at a faster pace, but have to complete each module by its due date in order to stay on track, and be on time with assignment submissions. See the Course Plan further below for the list of modules and completion due dates. There are two course plan options that you can follow: a 12-week plan, or a 6-week plan. The 12-week plan is recommended for most students; especially those who have not taken INST 733 - Database Design, and whose skill level is below “4” as outlined in the skill level self-assessment survey.

Examples and Exercises: Some modules will include examples and exercises. Students are expected to observe and analyze the examples, and then try applying what they have learned on a number of ungraded exercises. You are encouraged to seek the instructor's help if and when you encounter problems working on the exercises. Students' work on and solutions for the exercises will not be submitted and will not be graded.

Online and/or Face-to-face Help Sessions: Students will have the opportunity to work with the instructor online if they need and want to. Online sessions will be scheduled based on the need and the availability of the student and the instructor. We will use Adobe Connect and Team Viewer (available free of charge at <http://www.teamviewer.com>) for online help sessions, as needed. There may also be a number of face-to-face discussion and help sessions depending on the need. These sessions, if any, will be announced throughout the summer. Both the online and the face-to-face sessions will be optional. Students will not be required to attend any of these sessions. Attending or not attending the sessions will not have any grade consequences.

Assignments: Students will work on a number of graded assignments throughout the semester. These will generally focus on improving and extending the examples. Students are expected to **work on these assignments individually, and not receive any help from classmates or other individuals.** If any of the assignment due dates is a holiday for you, please inform the instructor in advance, so an alternate due date can be set for you. Students' work on and solutions for the assignments will be submitted via Canvas (ELMS) and will be graded.

Individual Project: Students will work on a semester-long individual project where they will build a small-scale, non-trivial web-enabled database application running on PHP and MySQL. Students will choose their topic and develop the underlying database structure in consultation with the instructor. If you have taken INST 733 - Database Design, you can use your INST 733 project database as the underlying database. The project application will be developed after the topic and the database is fully approved by the instructor. The application will perform basic functions that would be expected from a web-enabled database application, such as displaying, adding, editing, and deleting data. **Students are expected to work on this project individually, and not receive any help from classmates or other individuals.** Students' work on and deliverables for the individual project will be submitted via Canvas (ELMS) and will be graded.

Progress Updates: You are expected to email the instructor weekly updates about your progress. If you choose to follow the 6-week plan, you are expected to email the updates every three or four days. See the course plan further below for exact dates on which to email the updates.

Grading:

Assignments: 40%

Individual Project: 60%

There will be no mid-term exam or final exam for this course. Your grade will be based on your performance on the assignments and the individual project.

Text, Video and Online Resources:

Over the years, I have observed that students come to this course with different levels of existing knowledge and experience on server-side scripting and databases. Furthermore, students have different learning styles and benefit from different types of resources. While written materials works for some students, other students find audio-visual materials more helpful. I have also had numerous students who do most of their learning via reading online forums on PHP and MySQL. Consequently, there are no “required” textbooks or any other resources that I ask all students acquire and use. Instead, I give you an annotated list of text, video and online resources that will be conducive to your learning depending on your existing level of knowledge of web-enabled databases and your learning style. Feel free to contact me if you would like to discuss any of the items listed below.

Books:

- PHP and MySQL for Dynamic Web Sites: Visual QuickPro Guide (4th Edition), Larry Ullman, Peachpit Press, 2011. ISBN: 0321784073.
(A very balanced book that should appeal to both absolute new-comers, as well as students on an “intermediate” level. This is the book I will use most as a basis for my examples. If you are very new to scripting and databases, this may be a good choice as far as books go. An electronic version of this text is also available.)
- Head First PHP & MySQL, Lynn Beighley and Michael Morrison, O’Reilly, 2008. ISBN: 0596006306.
(A pretty fun book which provides a gentle introduction to PHP and MySQL. Should work nicely for the visual learner, but may be a little “too cute” for more experienced

students who are willing move more directly through topics. O'Reilly titles are available electronically to UMD student through the library website at <http://lib.umd.edu>.)

- Web Database Applications with PHP & MySQL (2nd Edition), Hugh Williams and David Lane, O'Reilly, 2004. ISBN: 0596005431.

(Covers topics in a straightforward and simple style, but may expect you to be already familiar with some basic web-enabled database concepts. May appeal more to students with some experience in programming and/or databases. O'Reilly titles are available electronically to UMD student through the library website at <http://lib.umd.edu>.)

- PHP and MySQL Web Development (4th Edition), Luke Welling and Laura Thomson, Addison-Wesley Professional, 2008. ISBN: 0672329166.

(This book covers more advanced topics compared to the other books listed. The progress through topics is faster than the other books, too. This might be of interest to students who come to the course with existing experience with scripting and databases.)

Video Resources:

- Lynda.com (access at <http://www.it.umd.edu/lyndatraining/>)

(A video training website which offers a few courses on PHP and MySQL among many other topics. This service is now available to UMD students free of charge, accessible at <http://www.it.umd.edu/lyndatraining/>. This is a great resource whether you want to follow a full course, or just need to look up certain topics.)

- Video2brain (<http://video2brain.com>)

(Another subscription-based video training website which offers more affordable subscription rates, but a somewhat more limited repertoire on PHP and MySQL. Some units (lessons) are free here, as well.)

- Youtube (<http://youtube.com>)

(Youtube features a large number of videos on PHP and MySQL. (A simple search for "PHP MySQL" returned over 300,000 hits.) However, finding a structured, high-quality course might be tricky, if not totally impossible. Still, this should be a good source for looking individual topics or problems up, whenever you need to see some extra examples.)

Websites:

- [w3schools.com \(http://w3schools.com\)](http://w3schools.com)
(This site features some quick, to-the-point lessons on PHP and SQL. These lessons may be a little terse for people who prefer detailed, step-by-step explanations, and should work better for “looking things up”, as a reference guide or checking out some extra examples.)
- [MySQL 5.x Reference Manual \(http://dev.mysql.com/doc/refman/5.7/en/index.html\)](http://dev.mysql.com/doc/refman/5.7/en/index.html)
(A comprehensive and authoritative reference manual for MySQL.)
- [PHP Manual \(http://php.net/manual/en/index.php\)](http://php.net/manual/en/index.php)
(A comprehensive and authoritative reference manual for PHP.)

Software:

We will use a number of freely available open source software for this course. Specifically we will use:

- Apache web server (or some other web server, if you already know how to install and administer it.)
- PHP 5 (This is required. No other scripting module will do.)
- MySQL database server (This is required. No other database server will do.)
- MySQL Workbench or MySQL GUI tools 5.0 (One of these is required. Feel free to use phpMyAdmin or any other GUI tool in parallel, but I will require you to send me your database dumps in one of MySQL Workbench or MySQL Administrator format. MySQL Administrator is part of the MySQL GUI Tools suite.)

The recommended way to acquire these components is to download a "distro" that bundles these software, such as XAMPP (available free of charge at <http://apachefriends.org>).

Distro installations are generally simpler, and XAMPP is recommended by the textbook from which I will assign readings; (chapters will be provided to you.) XAMPP includes Apache, PHP and MySQL. You will still need to download and install MySQL Workbench or MySQL GUI Tools separately, since neither of those is not included in XAMPP. Please install these software at your earliest convenience and no later than the end of the first week of the course.

Please refer to “Module 03 - Software Installation and Tests” on the ELMS course space for more information.

Policy on Academic Misconduct

Cases of academic misconduct will be referred to the Office of Student Conduct irrespective of scope and circumstances, as required by university rules and regulations. It is crucial to understand that the instructors do not have a choice of following other courses of actions in handling these cases. **There are severe consequences of academic misconduct, some of which are permanent and reflected on the student's transcript.** For details about procedures governing such referrals and possible consequences for the student please visit <http://osc.umd.edu/OSC/Default.aspx>

University of Maryland Code of Academic Integrity:

"The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://shc.umd.edu/SHC/default.aspx>."

Special needs

Students with disabilities should inform the instructor of their needs at the beginning of the semester. Please also contact the Disability Support Services (301-314-7682 or <http://www.counseling.umd.edu/DSS/>). DSS will make arrangements with the student and the instructor to determine and implement appropriate academic accommodations. Students encountering psychological problems that hamper their course work are referred to the Counseling Center (301-314-7651 or <http://www.counseling.umd.edu/>) for expert help.

Twelve-week Course Plan²

Week No. [Dates]	Module No.	Learning Module Title	Technology	Completion due date ³
1 [6/2-6/8]	01	Database basics and normalization		Monday, June 9
1 [6/2-6/8]	02	Introduction to web-enabled databases		Monday, June 9
1 [6/2-6/8]	03	Software installation and tests		Monday, June 9
2 [6/9-6/15]	04	Building a database on the MySQL database server	MySQL	Monday, June 16
2 [6/9-6/15]	05	Backing up and restoring databases	MySQL	Monday, June 16
2 [6/9-6/15]	06	Queries for viewing/listing data	MySQL	Monday, June 16
3 [6/16-6/22]	07	PHP introduction	PHP	Monday, June 23
3 [6/16-6/22]	08	Variables, Operators	PHP	Monday, June 23
3 [6/16-6/22]	09	Conditionals	PHP	Monday, June 23
4 [6/23-6/29]	10	Arrays, Array functions	PHP	Monday, June 30
4 [6/23-6/29]	11	Loops	PHP	Monday, June 30
4 [6/23-6/29]	12	User-defined Functions	PHP	Monday, June 30
5 [6/30-7/6]	13	HTML forms	HTML	Monday, July 7
5 [6/30-7/6]	14	Handling HTML forms in PHP (POST method)	PHP	Monday, July 7
5 [6/30-7/6]	15	Basic form validation, Form stickiness	PHP	Monday, July 7
6 [7/7-7/13]	16	Running queries through PHP and HTML forms	PHP + MySQL	Monday, July 14
6 [7/7-7/13]	17	Viewing/listing records based on a criterion	PHP + MySQL	Monday, July 14
6 [7/7-7/13]	18	Populating drop-down menus via queries	PHP + MySQL	Monday, July 14

Twelve-week Course Plan² (cont.)

Week No. [Dates]	Module No.	Learning Module Title	Technology	Completion due date³
7 [7/14-7/20]	19	Viewing/listing records from a join table	PHP + MySQL	Monday, July 21
7 [7/14-7/20]	20	Record-specific HTML links and pages (GET method)	PHP + MySQL	Monday, July 21
8 [7/21-7/27]	21	Queries for adding records through PHP	PHP + MySQL	Monday, July 28
8 [7/21-7/27]	22	Queries for deleting records through PHP	PHP + MySQL	Monday, July 28
8 [7/21-7/27]	23	Queries for editing records through PHP	PHP + MySQL	Monday, July 28
9 [7/28-8/3]	24	Paginating query results	PHP + MySQL	Monday, August 4
10 [8/4-8/10]	25	Displaying query results on sortable columns	PHP + MySQL	Monday, August 11
11 [8/11-8/17]	26	File uploads	PHP + MySQL	Monday, August 18
12 [8/18-8/22]	27	Cookies and sessions	PHP + MySQL	Friday, August 22

² This course plan is subject to change. Please check the ELMS site frequently for updates.

³ If you are following the 12-week plan, send your progress update emails to the instructor on these completion due dates.

Six-week Course Plan⁴

Week No. [Dates]	Module No.	Learning Module Title	Technology	Completion due date
1 [7/14-7/20]	01	Database basics and normalization		Monday, July 21
1 [7/14-7/20]	02	Introduction to web-enabled databases		Monday, July 21
1 [7/14-7/20]	03	Software installation and tests		Monday, July 21
1 [7/14-7/20]	04	Building a database on the MySQL database server	MySQL	Monday, July 21
1 [7/14-7/20]	05	Backing up and restoring databases	MySQL	Monday, July 21
1 [7/14-7/20]	06	Queries for viewing/listing data	MySQL	Monday, July 21
2 [7/21-7/27]	07	PHP introduction	PHP	Monday, July 28
2 [7/21-7/27]	08	Variables, Operators	PHP	Monday, July 28
2 [7/21-7/27]	09	Conditionals	PHP	Monday, July 28
2 [7/21-7/27]	10	Arrays, Array functions	PHP	Monday, July 28
2 [7/21-7/27]	11	Loops	PHP	Monday, July 28
2 [7/21-7/27]	12	User-defined Functions	PHP	Monday, July 28
3 [7/28-8/3]	13	HTML forms	HTML	Monday, August 4
3 [7/28-8/3]	14	Handling HTML forms in PHP (POST method)	PHP	Monday, August 4
3 [7/28-8/3]	15	Basic form validation, Form stickiness	PHP	Monday, August 4
3 [7/28-8/3]	16	Running queries through PHP and HTML forms	PHP + MySQL	Monday, August 4
3 [7/28-8/3]	17	Viewing/listing records based on a criterion	PHP + MySQL	Monday, August 4
3 [7/28-8/3]	18	Populating drop-down menus via queries	PHP + MySQL	Monday, August 4

Six-week Course Plan⁴ (cont.)

Week No. [Dates]	Module No.	Learning Module Title	Technology	Completion due date
4 [8/4-8/10]	19	Viewing/listing records from a join table	PHP + MySQL	Monday, August 11
4 [8/4-8/10]	20	Record-specific HTML links and pages (GET method)	PHP + MySQL	Monday, August 11
5 [8/11-8/17]	21	Queries for adding records through PHP	PHP + MySQL	Monday, August 18
5 [8/11-8/17]	22	Queries for deleting records through PHP	PHP + MySQL	Monday, August 18
5 [8/11-8/17]	23	Queries for editing records through PHP	PHP + MySQL	Monday, August 18
6 [8/18-8/22]	24	Paginating query results	PHP + MySQL	Friday, August 22
6 [8/18-8/22]	25	Displaying query results on sortable columns	PHP + MySQL	Friday, August 22
6 [8/18-8/22]	26	File uploads	PHP + MySQL	Friday, August 22
6 [8/18-8/22]	27	Cookies and sessions	PHP + MySQL	Friday, August 22

Under the 6-week course plan the progress update emails are due on:

Friday, July 18	Friday, August 8
Monday, July 21	Monday, August 11
Friday, July 25	Thursday, August 14
Monday, July 28	Sunday, August 17
Friday, August 1	Wednesday, August 20
Monday, August 4	Friday, August 22

⁴ **This course plan is subject to change. Please check the ELMS site frequently for updates.**