CSET 3300 Database-Driven Web Sites Course (4 semester credit hours)

CSET Required
IT Required

Current Catalog Description:

This course covers the creation of dynamic Web applications that interact with a database using server-side scripts and server programs. The material covered includes database fundamentals, server-side scripting language functions for database manipulation and server considerations.

Textbooks:

1. "Web Database Applications with PHP and MySQL",Hugh E. Williams and David Lane,O'Reilly Publishers, 2nd Edition
2. "Database Systems The Complete Book", Garcia-Molina et al, Prentice-Hall, 2nd Edition

References:

Course web pages: http://cset.sp.utoledo.edu/cset3300/

Related Program Outcomes:

- CSET Program (a, c and i) – See attached table
- IT Program (c, i, and j) – See attached table

Course Objectives:

After successful completion of this course, students will be able to:

- Develop an understanding of relational database concepts and design principles.
- Develop an understanding of basic and advanced SQL statements.
- Apply the PHP server-side scripting language and MySQL database management system to the creation of dynamic web site applications.
- Understand and implement realistic MySQL/PHP web applications.
- Use the Web effectively to locate reference and tutorial resources for MySQL and PHP

Course Outline – Major Content Areas

- Understanding the MySQL database server
- Creating and querying databases, the basic concepts
- Identifying database anomalies, normal forms and other database basics
- Building MySQL tables with the Structured Query Language
- Extracting database information with MySQL selects and functions
- Working with multiple tables using joins and unions
- PHP server-side scripting language
- Working with PHP variables, operators, control structures, and functions
- Writing readable, maintainable PHP code
- Using object-oriented techniques in PHP
- Performing simple and advanced database operations with PHP scripting
- Using PHP built-in functions
- Creating user-defined functions in PHP
- Implementing simple MySQL/PHP applications: e.g., a guestbook and a survey
- Developing more sophisticated MySQL/PHP applications: e.g., a catalog, a content manager, a threaded discussion, a problem tracking system, and a shopping cart.
- Creating HTML forms

Major Topics Covered in the Course

Topic	Lecture Hours
Information models and systems	3
Database systems	3
Data modeling	5
Relational databases	5
Database query languages	5
Relational database design	5
Transaction processing	1
Distributed databases	1
Physical database design	1
History of computing	1
Privacy Implications of Massive Database Systems	1
Declaration and types	2
Object-oriented programming	2
Network Security	1
Building Web Applications	5
Totals	40

Laboratory Projects:

Labs include a number of different database and PHP projects. PHP projects are taken from the following list:

- Generic dynamic Web sites
- Social Networking Site
- Blog/Discussion forum
- E-commerce Site
- Content management system
- News site

Oral and Written Communications

Not part of the course.

Social and Ethical Issues

Briefly discussed the issues involved with collaborating on programming assignments. Also discuss privacy implications and protection for massive databases, threats to privacy and technology approaches to privacy protection.

Theoretical Content

This course is an introduction to data structures and their implementation in a database management system. Topics include data models. Models include but are limited to hierarchical, network and relational data models. Normal forms of data, data description languages and query are also discussed.

Problem Analysis

This course emphasizes problem analysis in the areas of program development of databases. Students learn how to create PHP or other current database language code to describe a solution to a problem, select appropriate data types, and test the resulting program.

Solution Design

This course requires students to produce a number of programs that lead to a design solution for a programming problem. Each program is entered and modified to achieve a desired result.

Course Coordinator

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2/28/11

CSET	**ABET Course Outcomes:**	**Course Outcomes**	**Assessment Methods**
a	an ability to select and apply knowledge of computing and mathematics appropriate to the discipline. Specifically, an ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates the comprehension of the tradeoffs involved in the design choices	Ability to design a database in proper normalized form for a relational database	Evidenced by homework assignments and exam questions
b	an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.		
c	an ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs. Specifically, and ability to apply design and development principles in the construction of software systems of various complexity	Learn how to design databases and application logic for web applications that meet the requirements of an application	Evidenced by homework assignments designed to design and build a progressively more complex web application
d	an ability to function effectively as a member or leader on technical teams to accomplish a common goal.		
e	an understanding of professional, ethical, legal, security and social issues and responsibilities including a respect for diversity.		
f	an ability to communicate effectively with a range of audiences using a range of modalities including written, oral and graphical.		
g	an ability to analyze the local and global impact of computing on individuals, organizations, and society.		
h	recognition and understanding of the need for and an ability to engage in self-directed continuing professional development.		
i	an ability to select and apply current techniques, skills, and tools necessary for computing practice.	ability to use the current standard server-side scripting language, PHP, to create a database-driven web application as evidenced by the ability to solve a variety of database and PHP problems	as evidenced by the ability to solve a variety of database and PHP problems on programming assignments and the course midterm and final exams
j	an ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments, and to apply experimental results to improve processes		
k	a commitment to quality, timeliness, and continuous improvement		

IT	**Student Outcomes:**	**Course Outcomes**	**Assessment Methods**
a	an ability to select and apply knowledge of computing and mathematics appropriate to the discipline. Specifically, an ability to use and apply current technical concepts and practices in the core information technologies. [IT-j]		
b	an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.		
c	an ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs. And, an ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems. [IT-k]	Learn how to design databases and application logic for web applications that meet the requirements of an application	Evidenced by homework assignments designed to design and build a progressively more complex web application
d	an ability to function effectively as a member or leader on technical teams to accomplish a common goal.		
e	an understanding of professional, ethical, legal, security and social issues and responsibilities including a respect for diversity.		
f	an ability to communicate effectively with a range of audiences using a range of modalities including written, oral and graphical.		
g	an ability to analyze the local and global impact of computing on individuals, organizations, and society.		
h	recognition and understanding of the need for and an ability to engage in self-directed continuing professional development.		
i	an ability to select and apply current techniques, skills, and tools necessary for computing practice. And an ability to effectively integrate IT-based solutions into the user environment. [IT-l]	ability to use the current standard server-side scripting language, PHP, to create a database-driven web application as evidenced by the ability to solve a variety of database and PHP problems	as evidenced by the ability to solve a variety of database and PHP problems on programming assignments and the course midterm and final exams
j	an understanding of best practices and their application. [IT-m]	Ability to design a database in proper normalized form for a relational database	Evidenced by homework assignments and exam questions
k	an ability to assist in the creation of an effective project plan. [IT-n]		