ITM 402 SYLLABUS (DRAFT)

ITM 402 Introduction to Advanced Studies II

Hours: 3 credit hours / 45 contact hours

Instructor: Travis Smith

Textbook, title, author, and year:
Learning SQL: Mastering SQL Fundamentals, 2nd Edition, Alan Beaulieu, 2009.
Creating your MySQL Database: Practical Design Tips and Techniques, Marc Delisle, 2016.
Eloquent JavaScript, 2nd ed. Haverbeke, M., 2014
HTML5 for Web Designers 2nd ed. Keith, J. & Andrew, R., 2016
Responsive Web Design, 2nd ed. Marcotte, E., 2014

Specific course information:
a. **Catalog description:** Second course in a two-course sequence designed to prepare students for graduate study in information technology or cybersecurity. This course covers creation and deployment of modern, standards-compliant web pages written in HTML, CSS, and JavaScript in the context of the client-server architecture of the web. Students create and deploy a website with multiple, structured pages cross-linked by a site navigation structure. Basic data modeling concepts are also introduced. Covers hands-on database design, implementation, and administration of single-user and shared multi-user database applications using a contemporary relational database management system. Integration of web and database structures is introduced. Web and database development are taught in an integrated manner. This course does not apply toward undergraduate credit in the Department of Information Technology and Management, or to Master's, M.S., or Ph. D. credit in the College of Computing.
b. **Prerequisite/Corequisite:** ITM 401

Specific goals for the course
a. **Program Education Objective:**
1. Problem solve and create innovative answers to provide technology solutions for the problems of business, industry, government, non-profit organizations, and individuals.
b. **Course Outcomes:**
At the conclusion of this course, each successful student will able to:
- Recognize HTML, CSS, and JavaScript markup and code in a web page/application
- Select the proper mark-up tags or code to achieve a particular result
- Identify improperly used markup & code
- Produce standards-compliant web pages
- Deploy web pages to a public server

- Evaluate and adopt only the most standards-compliant documentation, libraries, and development techniques
- Write valid, well-formed semantic HTML; error-free, backward- and forward-compatible CSS; and error-free, progressively enhanced JavaScript
- Effectively comment on and format source code for maximum readability
- Track development of a project over time and collaborate with others using version control
- Describe the theoretical and physical concepts of a relational database.
- Employ design methodology for databases and verify their structural correctness.
- Use query languages, primarily SQL, and database management software.
- Design and build a simple database management system and perform fundamental tasks involved with modeling, designing, and implementing a DBMS.
- Demonstrate knowledge of essential DBMS concepts: database security, high availability, backup and recovery and SQL database tuning.
- Effectively integrate a database with a website
c. **Course student outcomes:**
At the conclusion of this course, each successful student will able to:
- Recognize HTML, CSS, and JavaScript markup and code in a web page/application
- Select the proper mark-up tags or code to achieve a particular result
- Identify improperly used markup & code
- Produce standards compliant web pages
- Create interactive web pages using Javascript
- Describe the theoretical and physical concepts of a relational database.
- Explain design methodology for databases and verify structural correctness
- Use query language, primarily SQL, and their database related supported software.
- Implement the theory behind the various database models and query languages.
- Design and build a simple database management system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.
- Outline essential DBMS concepts: database security, high availability, backup and recovery and SQL database tuning
- Create a website that integrates content from a DBMS

Topics to be covered
a. Introduction to databases & DBMS Concepts
b. GIT; HTML history, syntax, & fundamentals

   c.   Database Relational Model, Entity–Relation-
        ship Modeling, Intro to SQL
   d.   Database Design and more SQL Intro
   e.   Well formed, valid semantic HTML; global at-
        tributes
   f.   Data Definition Language, Data Types and
        Constraints, Normalization
   g.   Database Schema Definition, Table Creation,
        SQL Queries
   h.   SQL Intro
   i.   Responsive web design overview + HTML
        foundations
   j.   MySQL Workbench
        i.   Introduction Filtering (WHERE clause)
        ii. MySQL for Excel
   k.   CSS syntax & fundamentals; units of measure
        i.   CSS: typography
        ii. CSS: page layout (fluid grids), feature detec-
            tion
   l.   Database joins & sets
   m. Database Case Studies and MySQL Server
        i.   Server Administration
   n.   Web responsive images, accessible media
   o.   Database Subqueries Grouping and Aggregates
   p.   Javascript
        i.   syntax, fundamentals, data structures
        ii. functional programming style
   q.   Database Advanced Joins
   r.   Database Conditional Logic
   s.   DBMS Transactions
   t.   DOM Scripting
        i.   Javascript + the Document Object Model
        ii. JQuery and alternatives
   u.   DBMS Indexes and Constraints
   v.   DBMS Views and Metadata
   w. Web inobtrusive Javascript & progressive
        enhancement
   x.   Database Programming/APIs; SQLite
   y.   Javascript
        i.   non-blocking asynchronous patterns
        ii. page performance
   z.   Database auditing and security
  aa. Web/database introdustion
  bb. HTTP 1.1, HTTP/2, and REST architecture;
        server-side web development
  cc. Basics of web security
  dd. Database Backup and Disaster Recovery
  ee. Introduction to NoSQL databases and Big Data