SAGRADO
Universidad del Sagrado Corazón

Syllabus

Title: Web Application Development

Code: CCO 245

Prerrequisite: CCO 140

CREDITS: 3 credits | 45 contact hours | 1 term

Description

This course covers the principles and technologies used in the development of web-based applications. Topics include web architecture, scripting, and programming languages—both front-end and back-end. Students will acquire practical skills in the design and construction of dynamic and interactive web applications, including client-side and server-side development.

Justification

Within the field of Computer Science, the area that has seen the most development in recent years has been the Internet. And the Internet and the World Wide Web are expected to remain the fastest-growing areas in the future. Specialists in this field must be familiar with the tools available for designing applications to be implemented on a website that meet industry standards. In this way, they will be equipped to meet the demands of their field.

COMPETENCIES

The course develops the following competencies in students:

- **Communication**
- **Ethical Reflection**

OBJECTIVES

Upon completion of the course, students will be able to:

1. Recognize the impact of the World Wide Web on various areas of human activity.

2. Understand the fundamentals of computer networks, the Internet, and the World Wide Web.

3. Integrate theory and practice when developing correct and well-documented programs to run on websites.

4. Understand the different tools available for developing Web applications and their characteristics, and be able to select the best tool for the problem at hand.

5. Develop solutions to a problem using a methodology of successive refinements in algorithm design.

6. Develop correct and well-documented programs to run on web pages.

7. Use technology appropriately and responsibly, demonstrating a sense of ethics in both professional and personal conduct.

8. Develop self-learning skills.

9. Express themselves clearly and coherently, both orally and in writing.

10. Integrate theory and practice by creating applications to be run on a website.

Content

I. Introduction to Internet Technologies

A. Networks
   1. Fundamental Concepts
   2. Client-server architecture
   3. Historical Development of the Internet
   4. Communication Protocols: HTTP, FTP, etc.

B. The World Wide Web
    1. browsers
    2. techniques used on the Web

II. Website creation

A. Design process
    1. Analysis and design phases
    2. Website goals and objectives
    3. Website Audience
    4. Content
    5. "Site Plan/Map"
    6. Types of Websites (static vs. dynamic, specific types)
    7. Page Design
    8. Large pages vs. small pages
    9. Types of pages: entry, exit, tasks, content, navigation
    10. Links: text, buttons, graphics
B. Managing page content and style
    1. HTML
    2. Tables
    3. Forms
    4. CSS
    5. CSS/HTML Integration

III. Web Application Development Tools

A. Java
B. JavaScript/React
C. PHP
D. Perl
E. Other

IV. Web Programming

A. Client-side programming vs. server-side programming
B. “front-end” vs. “back-end”
C. Application development platforms (SDKs)
D. PHP

1. Variable and Data Types
2. Reading data and outputting results
3. Loops and conditions
4. Arrays
5. Files
6. Tables and forms
7. Application/HTML integration

E. JavaScript
1. Variable and Data Types
2. Reading Data and Outputting Results
3. Loops and conditions
4. Arrays
5. Files
6. Application/HTML Integration

V. Ethical and information security considerations

A. Privacy (Regulations)
B. Bias and Discrimination in Algorithms
C. Addiction
D. Environmental Impact
E. Security

METHODOLOGY

The following active learning strategies are recommended:

- Discussions, forums, debates, or panel discussions
- Case study method
- Practical exercises
- Collaborative learning
- Multimedia resources
- Critical analysis of readings

ASSESSMENT

Participation	10%
Midterm Assignments	40%
Project or Exam (Final Assessment)	20%
Essays	30%

TOTAL	100%

Student Learning Assessment

The institutional assessment rubric is applied to the core activity of the course.

BIBLIOGRAPHY

Comer, D. E. (2019). *The Internet Book* (5th ed.). CRC Press.

Deitel, P. J. (2009). *JavaScript for Programmers*. Pearson/Prentice Hall.

Duckett, J. (2022). *Front-End and Back-End Development with HTML, CSS, JavaScript, jQuery, PHP, and MySQL* (1st ed.). Wiley.

Frein, B. (2022). *Responsive Web Design with HTML5 and CSS*. (4th ed.). Packt Publishing Ltd.

Gordon, Z. (2020). *JavaScript Explained*. OS Training, LLC.

Gordon, Z. (2020). *React Explained*. OS Training, LLC.

Megosinarso, R. (2023). *Build a Website Now*. Self-published. Robins, J. N.

(2018). *Learning Web Design*. O'Reilly.

Sebesta, Robert W. (2019). *Programming the World Wide Web* (8th ed.). Pearson India.

Tatroe, K. & McIntyre, P. (2020). *Programming PHP*. O'Reilly Media.

ELECTRONIC RESOURCES

Windows Microcomputers

Course Website

Internet and Web access to run Microsoft programs

www.microsoft.com

World Wide Web Consortium www.w3c.org

JavaScript Tutorial https://javascript.info/

JavaScript Documentation https://developer.mozilla.org/en-US/docs/Web/JavaScript

PHP Documentation https://www.php.net/manual/en/

Codecademy https://www.codecademy.com/

Development Platforms https://leetcode.com/, https://www.jdoodle.com/, https://ideone.com/

W3Schools Tutorials https://www.w3schools.com/

You can find more resources related to the course topics on the library page http://biblioteca.sagrado.edu/

Reasonable Accomodation

Reasonable Accomodation

For detailed information on the process and required documentation, please visit the appropriate office. To ensure equal opportunity, in compliance with the ADA (1990) and the Rehabilitation Act (1973), as amended, any student who requires Reasonable Accomodation or special assistance must complete the process established by the Vice-Presidency for Academic Affairs.

ACADEMIC INTEGRITY

This policy applies to all students enrolled at the Universidad del Sagrado Corazón to take courses with or without academic credit. A breach of academic integrity is any act or omission that fails to demonstrate the honesty, transparency, and responsibility that should characterize all academic activity. Any student who violates the policy on honesty, fraud, and plagiarism is subject to the following sanctions: a grade of zero on the assessment and/or having to redo the seminar assignment; a grade of F(*) in the seminar; or suspension or expulsion, as established in the Academic Integrity Policy document effective November 2022.

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