Cleveland State University
Department of Electrical and Computer Engineering

CIS 408: Internet Computing

Catalog Description:

CIS 408 Internet Computing (3-0-3)

Pre-requisite: CIS 265

World-Wide Web is now being used as a platform to build sophisticated interactive applications, replacing the traditional mechanism of installable binaries. Web-based applications offer numerous advantages, such as instant access, automatic upgrades, and opportunities for collaboration on a massive scale. However, creating Web applications requires different approaches than traditional applications and involves the integration of numerous technologies. This course will introduce to the Web technologies and give students experience creating Web applications. In the process, the students will learn about hyper markup languages, scripting languages, network protocols, data exchange protocols, interactive graphics, event-driven programming, and interaction with database servers. The students will understand how they all are integrated together to deliver web applications. The topics include Hyper Text Markup Language (HTML), Cascading Style Sheet (CSS), JavaScript, Hypertext Preprocessor (PHP), Document Object Model (DOM) for Document structure, Extensible Markup Languages (XML), JavaScript Object Notation (JSON), separation of content & style, reuse, Model View Controller (MVC), Angular JS, Hyper Text Transfer Protocol (HTTP), Asynchronous JavaScript and XML (AJAX), Node JS, Representational State Transfer (REST) Web Service Design with Create, Retrieve, Update, Delete, Execute (CRUDE) operations, Open Database Connectivity (ODBC)/Java Database Connectivity (JDBC) with Relational DBMS and Semi-Structured DBMS, Cookies/Sessions, and Web Application Security. The course will advance with Cloud Computing concepts and applications at the end.

Textbook:

1. Lecture Notes – Will be given in Class

   Available at: [http://cdn.oreilly.com/books/9780596527402/9780596527402_supp.pdf](http://cdn.oreilly.com/books/9780596527402/9780596527402_supp.pdf)


References:

Online Documentations and Resources for Each Topic Will Be Given in
World-Wide Web is now being used as a platform for sophisticated interactive applications, replacing the traditional mechanism of installable binaries. Web-based applications offer numerous advantages, such as instant access, automatic upgrades, and opportunities for collaboration on a massive scale. However, creating Web applications requires different approaches than traditional applications and involves the integration of numerous technologies. This course will introduce to the Web technologies and give students experience creating Web applications. In the process the students will learn about markup languages, scripting languages, network protocols, interactive graphics, event-driven programming, and interaction with database servers, and see how they all are integrated together to deliver web applications. Topics include Hyper Text Markup Language (HTML), Cascading Style Sheet (CSS), JavaScript, Hypertext Preprocessor (PHP), Document Object Model (DOM) for Document structure, Extensible Markup Languages (XML), JavaScript Object Notation (JSON), separation of content & style, reuse, Model View Controller (MVC), Angular.js, Node.js, Hyper Text Transfer Protocol (HTTP), Asynchronous JavaScript and XML (AJAX), Representational State Transfer (REST) Web Service design, Cookies/Sessions, Open Database Connectivity (ODBC)/Java Database Connectivity (JDBC) with Relational DBMS and Semi-Structured DBMS - Schema, Objects, Create, Retrieve, Update, Delete, Execute (CRUDE) operations, and Security. The course will advance with Cloud Computing concepts and applications at the end.

Upon completion of this course, students should be able to:

1. Understand technologies and concepts of the modern web application architecture with web browsers, web servers/application servers, and database server.
2. Integrate them together to build web applications using HTML/XHTML, CSS, JavaScript, Extensible Markup languages (XML), separation of content & style, reuse, Document object Model (DOM), Model View Controller (MVC), Angular.js, HTTP, AJAX, Node.js, Cookies/Sessions, ODBC/JDBC with Relational DBMS, Semi-Structured DBMS, REST API design with CRUDE Operations, Cookie/Session, and Web Security.
3. Be able to extend their skills to build Cloud based web applications.
1. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
2. An ability to function effectively on teams to accomplish a common goal
6. An ability to translate fundamental computing concepts to a variety of emerging technologies
7. An ability to apply design and development principles in the construction of software systems of varying complexity

Outcomes:
(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
(e) An understanding of professional, ethical, legal, security and social issues and responsibilities
(g) An ability to analyze the local and global impact of computing on individuals, organizations, and society
(i) An ability to use current techniques, skills, and tools necessary for computing practice.
(k) An ability to apply design and development principles in the construction of software systems of varying complexity.

Contribution of Course to Meeting the Professional Component:
Math & Basic Science: 0 credit;
Engineering Topics: 3 credits;
General Education: 0 credit

Prerequisites by Topic: Data Structures and Algorithms (Topics covered in CIS265)

Major Course Topics:

1. Introduction to World Wide Web, HTML, HTML5, XHTML 3
2. Cascading Style Sheet (CSS), Universal Resource Locator 3
3. Java Script and Programming 3
4. Document Object Model (DOM), XML, JSON 4
5. Responsive Web Design with Bootstrap, JQUERY) 3
6. Asynchronous Java Script and XML (AJAX) 3
7. Angular JS 3
8. Hypertext Preprocessor (PHP) 3
9. Hyper Text Transfer Protocol (HTTP) 3
10. Database Programming: Embedded SQL, Dynamic SQL with Open Database Connectivity (ODBC)/Java Database Connectivity (JDBC) 3
11. Server Side Programming: Model-View-Controller (MVC) 3
12. Web Server and Node JS 3
14. Cookies/Sessions 3
15. Web Application Security: Same Origin Policy 3

Total 46

Major Lab Topics:

1. Create Web Pages with XHTML and CSS
2. Building Dynamic Webpage Functions with XHTML, JavaScript, and Document Object Model (DOM)
3. Transformation of Web Data Exchange Formats in XML, JSON
4. Building Dynamic and Responsive Web Pages with Bootstrap and Angular JS
5. Communications between Web Browser as Client and Web Server in HTTP and Same Origin Policy
6. Server Side Programming: Communication between Application Server and Database Server
7. Building a Web Application in Model, View, Controller (MVC)
8. Project: Building a Web Application with Real Life Data

Total equivalent lecture hours 23

Computer Usage: The following software will be used for the computer lab to build a web service application:
Internet Browser
WAMP Server (PHP, Apache Web Server, and MySql on Window OS) or
LAMP Server (PHP, Apache Web Server, and MySql on Linux)
ASP .NET with IIS and Microsoft SQL Server (2014 or higher)
Node JS and Angular JS