



Course Syllabus

Course Code	Course Title	ECTS Credits
COMP-470	Internet Technologies	6
Prerequisites	Department	Semester
COMP-212	Computer Science	Fall, Spring
Type of Course	Field	Language of Instruction
Elective	Computer Science	English
Level of Course	Lecturer(s)	Year of Study
1 st Cycle	Dr. Constandinos Mavromoustakis	4 th
Mode of Delivery	Work Placement	Corequisites
Face-to-face	N/A	None

Course Objectives:

The main objectives of the course are to:

- explore the basic concepts of the Internet, Internet Services and Protocols, World-Wide-WEB Services
- provide students with deep knowledge for sockets and Client/Server structures, socket programming, N-tier architecture of the global internet. Servers and State management
- thoroughly discuss the potential of web based applications with the utilized protocols and provide students with deep knowledge for developing web applications and critically assess the Web usability, server configuration and server based executable and scripts
- explore the basic concepts of thin and thick client scripting
- determine and demonstrate the HTTP Protocol and demonstrate and analyze the basic conceptual model for HTTP servers' and clients' communication with regards to the model RFC2965 - HTTP State Management Mechanism
- make students aware of the TCP/IP stack and protocols (TCP/IP Tutorial, RFC 1180) and application interface
- provide students with deep knowledge of the architecture and structure according to certain requirements of the World Wide Web, explore the basic concepts of using a Uniform Resource Identifier (URI) to access a resource, representation management, URI persistence, Linking and data access control
- provide students with deep knowledge for concepts about the Web caching and the utilizing state-of-the-art notation currently used

- explore the basic standards to promote common data formats and exchange protocols on the Web (i.e. Resource Description Framework (RDF) etc)
- critically assess and acquire a deep knowledge on client site caching control, WEB Proxies, Web caching includes additional configuration and administration of Squid Cache
- discuss and provide students with deep knowledge for XML & Web Technologies, and cover in detail all aspects of the Web Programming: HTML, XHTML, Object Models, Styles, Dynamic content, DHTML
- make students aware of how to program the WEB using Client scripting, JavaScript, Jscript, VB Script and demonstrate to students the Perl and ASP scripting
- demonstrate and analyze the basic conceptual model of the Socket Programming (Unix, Winsock, .NET)
- provide students with deep knowledge for the Semantic Web and introduce state-of-the art research in the area of the WWW

Learning Outcomes:

After completion of the course students are expected to be able to:

- recognize communication protocols used in web technologies
- characterize the Internet technology and the underlying protocols that are supported by the Internet technology. Internet Services and Protocols. World-Wide-WEB
- review of TCP/IP and application interface
- critically compare and evaluate HTTP Protocol, HTTP servers and clients, SSL. Thorough coverage of the HTTP Protocol. HTTP servers and clients, Hypertext Reference Model. RFC2965 - HTTP State Management Mechanism
- introduce state-of-the art research in the area of Web caching, Client site caching control, and WEB Proxies
- cover in detail and gain experience of the Web Programming and the technologies currently being used for programming: HTML, XHTML, Object Models, Styles, Dynamic content, DHTML and .NET programming aspects
- provide students with deep knowledge for developing Web-applications: N-tier applications, Usability Principles, Methodologies & Evaluation, Unicode
- introduce state-of-the art research in the area of Internet Technologies regarding the Caching Techniques for Streaming Media
- make students aware of the technical requirements in order to effectively construct basic professional skills for the WWW, including hands-on experience with TCP/IP and web-based programming using up-to-date tools
- research in state-of-the art areas regarding the Semantic Web and provide students with experience in developing client-based, resource constrained applications on the WWW

Course Content:

1. Nature of the Internet. Internet Services and Protocols. World-Wide-WEB
2. Review of TCP/IP and application interface
3. Sockets and Client/Server structures, N-tier architecture of the global internet. Servers and State management, Usability Principles, Methodologies & Evaluation, Unicode
4. HTTP Protocol. HTTP servers and clients, Hypertext Reference Model/RFC2965 - HTTP State Management Mechanism
5. TCP/IP stack and protocols (TCP/IP Tutorial, RFC 1180) and application interface
6. Architecture of the World Wide Web. Using a Uniform Resource Identifier (URI) to Access a Resource, Representation Management, URI persistence, Linking and access control
7. Web caching. Client site caching control. WEB Proxies. Web caching include additional configuration and administration of Squid Cache
8. Markup language using the XML & Web Technologies. Briefly cover the Web Programming: HTML, XHTML, Object Models, Styles, Dynamic content, DHTML
9. Programming the WEB: Client scripting. JavaScript, Jscript, VB Script
10. TCP/IP Protocol. Socket Programming paradigms using Java (Unix, Winsock, .NET)
11. System issues related to Internet programming and performance: protocols, client and servers, WWW interactivity, user semantic demands, Internet-based distributed systems
12. Peer-to-Peer Content Networks and Caching Techniques for Streaming Media/survey of current research on the topic

^{*}Including Emulation/Simulation experiments for certain network scenarios using Core packages by Oracle, NS-3 and other integrated packages

Learning Activities and Teaching Methods:

Lectures, Lab Presentations, Lab Tutorials, Practical Exercises and Assignments.

Assessment Methods:

Tests/Quizzes, Design project, Homework, Project, Mid-Term, Final Exam.

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Web Services: Principles and Technology	Papazoglou M.	Prentice Hall	2014	ISBN-10: 0321155556 ISBN-13: 9780321155559
Internet & World Wide Web How to Program, 5/e	Deitel M.H. and Deitel P.J.	Pearson Inc.	2015	1400pp., ISBN: 0-13-1752421

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
TCP/IP sockets in C, Practical Guide for Programmers	Donahoo J.M. and Calvert K.L.	Morgan Kauffman	2010	1-55860-826-5
Programming the World Wide Web	Sebesta W.R.	Addison Wesley	2011	ISBN-10: 0321489691 ISBN-13: 9780321489692
Core Web Programming	Hall M. and Brown L.	Prentice Hall	2014	0-13-089793-0