



**TURKISH REPUBLIC**  
**FIRAT UNIVERSITY**  
**COLLEGE OF TECHNOLOGY**  
**DEPARTMENT OF SOFTWARE ENGINEERING**

**COURSE SYLLABUS**  
**SENG 522 Web Application Development**

**Location:** Lecture and Lab: Software Engineering Building

| <b>Class meeting times:</b> | <b>Lab meeting time:</b> | <b>Instructor:</b>            | <b>Teaching Assistant</b> |
|-----------------------------|--------------------------|-------------------------------|---------------------------|
|                             |                          | Assist. Prof.<br>Mustafa ULAS |                           |

**Office hours:** Please see the notice board outside each faculty member's office.

**Course description:** This course involves a study of the methods used to extract and deliver dynamic information on the World Wide Web. The course uses a hands-on approach in which students actively develop Web-based software systems. Additional topics include installation, configuration, and management of Web servers. Students are required to have access to a PC on which they can install software such as a Web server and various programming environments.

**Course objectives:**

Students will learn the ins and outs of developing Web applications using modern technologies and best practices. Topics (in rough order of when they will be covered) include:

- Current Events and Web Development
- HTTP, DNS and Web Servers
- Apache/MySQL/PHP (AMP Stack) Configuration
- XHTML and HTML5
- CSS Level 2.1/CSS3
- JavaScript
- Document Object Model (DOM)
- jQuery, jQuery UI
- Alternate presentation of data (XML, JSON)
- AJAX
- Front-end optimization and workflow
- PHP
- MySQL
- Back-end workflow
- Revision control



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- Authentication and Authorization
- Web Security (XSS, CSRF, SQL Injection)
- APIs and Web Services
- Intro to Content Management Systems
- Intro to Performance Tuning

**Learning Outcomes:**

1. Students will be able to explain and configure the fundamental structure of a Web application, including the server environment, protocols used, and other underlying systems.
2. Students will be able to evaluate and justify choices in design patterns and technologies used in Web application development.
3. Students will be able to apply the principles of progressive enhancement in front-end Web development using HTML, CSS and JavaScript.
4. Students will be able to create, interpret and apply planning artifacts commonly used in modern Web application development, including the use of project specifications, wireframes, and site maps in the Web development process.
5. Students will be able to develop and troubleshoot secure Web application back-ends using an Apache, PHP and MySQL technology stack.
6. Students will understand and be able to implement the basic principles of Web services from the perspective of both the client and service provider.
7. Students will learn the inherently collaborative and cross-disciplinary nature of modern Web application development, with consideration for the social, ethical, political and economic factors that drive development and innovation forward.

**Textbook:**

There is no textbook required for this course. The course material comes primarily from course notes and a selection of recent papers on advanced Internet application development and related research issues, including search engines, Web servers, Wide-area distributed information systems, and Web database systems. However, there may be textbooks that you will find useful or even necessary in order to complete your course projects.

**Useful Reference Text Books (Not Required)**



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1. Building Secure and Reliable Network Applications , Prof. Kenneth P. Birman Manning Pub. Co. 1996, Hardbound, 591 pages, ISBN 0137195842. It can be ordered from Follett DirectNet, 1-800-621-4088.
2. Understanding Search Engines: Mathematical Modeling and Text Retrieval (Software, Environments, and Tools), Michael W. Berry and Murray Browne.
3. Modern Information Retrieval, Berthier Ribeiro-Neto, Ricardo Baeza-Yates (ACM Press Series) May 1999. Addison-Wesley Pub Co; ISBN: 020139829X.
4. The Developer's Guide to the Java(tm) Web Server(tm): Building Effective and Scalable SeverSide Applications, Dan Woods, Larne Pekowsky, Tom Snee, and Connie Welss
5. Web Server Technology, Nancy J. Yeager and Robert E. McGrath, Morgan Kaufmann Publishers, 1996.
6. Web Proxy Servers, Ari Luotonen, Prentice Hall, 1998
7. The Grid: Blueprint for a New Computing Infrastructure, Edited by Ian Foster and Carl Kesselman, Morgan Kaufmann Publishers, 1998.
8. HyperText Transfer Protocol - HTTP/1.1 T. Berners-Lee, R. Fielding, H. Frystyk, J. Gettys, and J. Mogul, RFC #2068, January, 1997.
9. Apache Group, Apache HTTP Server Version 1.3, May, 1998.
10. The Art of Computer Systems Performance Analysis, Raj Jain, John Wiley and Sons, 1991
11. JavaSpace(TM) Technology: A Tutorial and Reference Guide, Ken Arnold, Eric Freeman and Susan Hupfer, Addison-Wesley
12. The Java Programming Language Second Edition, Ken Arnold and James Gosling, Addison-Wesley, 1998.
13. Concurrent Programming in Java: Design Principles and Patterns, Doug Lea, Addison-Wesley, 1997.
14. The Java Virtual Machine Specification, Tim Lindholm and Frank Yellin, Addison-Wesley, 1997.
15. Finding Web Pages.

**Course requirements:**

**Assignments:** Students will be required to complete five programming assignments. Students will be given two weeks to complete each assignment. Four of the assignments will count towards the final grade, giving student the option to drop their lowest graded assignment.

**Exams:** Three exams, including the final exam, will be given. Students will be given at least one week notice of the exam dates. All examinations are written examinations and students are required to provide their own



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answer sheets for each exam. There are no make-up examinations available for any student except the regulation rules.

**Labs:** All students need to join the lab section. Students will have total of 11 labs. The labs should be finished within the dedicated time slot. Each work needs to be checked and graded by the Lab TA. If the student is not able to finish the task within the lab session due to an unexpected event/bug/etc., he/she may ask the lab TA to have an extension of one week at the end of the lab.

|                           |     |
|---------------------------|-----|
| Grading plan: Assignments | 10% |
| First exam                | 10% |
| Second exam               | 10% |
| Lab                       | 10% |
| Final exam                | 60% |

|                      |               |   |
|----------------------|---------------|---|
| $\geq 90$            | $\Rightarrow$ | A |
| $\geq 80$ but $< 90$ | $\Rightarrow$ | B |
| $\geq 70$ but $< 80$ | $\Rightarrow$ | C |
| $\geq 60$ but $< 70$ | $\Rightarrow$ | D |
| $< 60$               | $\Rightarrow$ | F |

### **Class participation**

In accordance with the university policy, regular attendance is required; however, no points will be awarded or subtracted based on your attendance. You are responsible for all material covered in every class, regardless of whether you attended or not. It is your responsibility to obtain notes, assignments, etc., from fellow class members if you miss the class.

### **Academic dishonesty**

All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The university and its official representatives may initiate disciplinary proceedings against a student accused of any form of



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academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials. No cheating on an examination or assignments is allowed; a score of zero will be given to the student if such a case occurred.

**Rules of conduct**

Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. Please turn off or mute your cellular phone and/or pager before class begins. Students are prohibited from eating in class, using tobacco products, making offensive remarks, reading newspapers, sleeping, talking among each other at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a, minimally, a directive to leave class or being reported to the Dean of Students for disciplinary action in accordance with university policy.

**Visitors in the classroom**

Occasion visiting of classes by responsible individuals is allowed with prior arrangement with the instructor, as long as it does not interfere with the registered members of the class or the educational process.