

Web Based Control - 3CR

Instructor: Dr. Aleksander Malinowski <http://gdansk.bradley.edu/olekmali/>

Actual course description

Internet based technologies available for engineering applications; Programming in computer languages appropriate for Web embedded and client-server applications; Introduction to high-level Internet protocols; Applications to monitoring and control of remote engineering systems.

Prerequisites by topics

Proficiency in computer programming, preferably in C/C++; Knowledge of the object oriented programming concept; EE221 satisfies these requirements.

Textbooks and/or other required material

1. Webmaster in a Nutshell, 3rd Edition by S. Spainhour, R. Eckstein; O'Reilly; ISBN 0-59600-357-9
2. **Just Java 2, 6th Edition by Peter Van Der Linden; Prentice Hall; ISBN 0-13148-211-4**
3. Learning Perl, 4th Edition by R.L. Schwartz, T. Phoenix, B. D. Foy; O'Reilly; ISBN 0-59610-105-8

Course Objectives

1. Learn how to create JavaScript enhanced HTML web pages with forms
2. Learn how to deal with and visualize data stored in XML format
3. Getting perspective on high level programming languages by learning Java through comparison to C++
4. Exercise basic to moderately advanced object oriented programming
5. Learn the concept of applications with graphical user interface and event-driven programming approach
6. Learn the concept of multithreaded programming
7. Learn the basic to moderately advanced network programming using client-server architecture
8. Learn the basics of the most common Internet protocols: HTTP, SMTP, POP3, time, echo
9. Getting perspective on scripting languages by learning the basics of PERL and utilizing it to engineering text data processing
10. Learning the concept of Active Server Pages by learning PHP language
11. Learn the concept of CGI programming by utilizing PERL and C
12. Acquire a better understanding of software development process via numerous homework assignments
13. Acquire basic to moderate software troubleshooting skills via numerous homework assignments

Topics Covered

1. Creating JavaScript enhanced HTML web pages (7 lectures)
2. Operating on data stored in XML format (1 lecture)
3. **Introduction to programming in Java for C++ programmers**
4. **Java for engineering applications: GUI development, event-driven programming, threads**
5. **Introduction to client-server programming**
6. **System monitoring and control over Internet using client-server architecture**
7. **Sensor and actuator discovery with multicasting**
7. **Internet protocols: HTTP (Web), SMTP (send email), POP3 (check email), time, echo**
8. **Introduction to PERL, engineering data management with PERL**
9. Active Server Pages with PHP
10. PERL for CGI programming
11. Remote data acquisition and processing using CGI programming

A Word of Caution: Laborious Course

This is a fast paced course. It is not very difficult but it may be laborious as we will cover an almost entirely different topic each week. It could be very laborious to students who are slow programmer. Graduate students who took only one programming course, or took their programming courses long time ago are cautioned. This is not a substitute course for introductory programming course.