Syllabus

Course: CS4244: Internet Programming
Class: 10:10 – 11am Monday, Wednesday, Friday
Room: Hutcheson 409
URL: http://courses.cs.vt.edu/~cs4244/spring.06/
Listserv: CS4244_16599@listserv.vt.edu.

Instructor: Dr. Eli Tilevich
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Office: 562 McBryde
Office Hours: noon-1pm Monday, Wednesday, and Thursday

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Office: 133 McBryde
Office Hours: 10-11:30 Tuesday and Thursday

Overview:
Over the course of the last decade and a half, the ever-changing phenomenon of the World Wide Web has transformed our world through the Internet revolution in a variety of ways. The need to meet the technical challenges of the Internet has driven innovation in several areas of computing. It would not be an exaggeration to say that most programming jobs these days involve some kind of Internet programming.

This course aims to provide students with the tools required to become and remain competent and successful Internet programmers. To accomplish this objective, this course introduces students to the main Internet programming concepts through significant hands-on experience with specific Internet technologies.

This course includes three programming projects, a research project (exploring in detail an Internet technology or an issue), a term project (prototyping a new Internet product or a company), and two examinations (a midterm and a final). All projects can be accomplished either individually or in groups.

Course Objectives:
- Introduce students to the major Internet programming concepts such as:
  a. The client-server programming model
  b. Protocols
  c. Server design and construction
     i. Performance
ii. Fault tolerance
iii. Caching
iv. Proxying
d. Heterogeneity
e. Interoperability
f. Security
g. Internet programming abstractions and frameworks
h. Real-time media protocols
i. Peer-to-Peer Protocols

• Provide students with a significant hands-on implementation experience of
programming the Internet at different levels of abstraction including:
  a. Sockets
  b. Remote Procedure Calls
  c. Web Services
• Provide an opportunity for students to explore in detail an Internet technology of their
choice and share their findings with the class
• Provide an opportunity for students to brainstorm and come up with an idea for a new
Internet product or a company.

Teaching approach:
Programming is one of those skills that can only be learned by doing. Internet
programming is no exception. Therefore, this course has a significant programming
component. However, in learning a computer science discipline, it is essential that one
distinguish between concepts and technologies. While concepts remain the same (or at
least evolve very slowly), technologies tend to proliferate, particularly in the case of the
Internet. For a handful of Internet programming concepts, one can find multiple
technologies that implement them. Having a thorough understanding of concepts is the
avenue through which one can gain the abilities to learn new technologies quickly and to
distinguish between marketing hype and sound technical arguments. Therefore, the
specific Internet technologies that the students will learn in this course are selected
primarily on the basis of how well they demonstrate the underlying concepts.

Prerequisites:
• CS 3204: Operating Systems
• Proficiency in the Java programming language (students with insufficient background
  in Java but strong programming skills should be able to learn Java by completing
  web-based self-study courses that will be pointed out by the instructor)
• Ability to write programs that are 10 to 40 pages long

Textbooks:
No textbook is required for this course. All the reading assignments will come from web
pointers and handouts. The following texts can be of interest:
• TCP/IP Sockets in Java, Practical Guide for Programmers, Michael Donahoo and Ken Calvert, Morgan Kaufmann.

Grading:
Semester grades will be determined after all work has been completed and graded. Point ranges for letter grades may be based on a number of factors, including absolute and relative performance.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Programming Projects (3)</td>
<td>40%</td>
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<tr>
<td>Research Project</td>
<td>15%</td>
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<tr>
<td>Term Project</td>
<td>20%</td>
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<tr>
<td>Midterm</td>
<td>10%</td>
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<tr>
<td>Final</td>
<td>10%</td>
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<tr>
<td>Class Participation</td>
<td>5%</td>
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Collaboration Policy and Honor Code:
The class website has links to the following policies that apply to this class: University Policy of Class Attendance, the Honor Code, and the ACM and IEEE Code of Ethics.

Students with Disabilities:
If you need adaptations or accommodations because of a disability (learning disability, attention deficit disorder, psychological, or physical), if you have emergency medical information to share with the instructor, or if you need special arrangements in case the building must be evacuated, please meet with the instructor as soon as possible.