CS612/IT626 Concepts and Structures in Internet Computing

Instructor   Dr. Lixin Tao, ltao@pace.edu, http://csis.pace.edu/lixin
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Lectures   100% online

Office Hours   Thursdays 1PM – 4PM at office GC550 or Pleasantville Goldstein 310. Please let me know your preferred meeting time and location beforehand so I could be there for you on time.

Syllabus

Integrated hands-on coverage of fundamental concepts and technologies for enterprise and Internet computing. Topics include data storage; XML data specification, parsing and validation; data and language translation; networking and web technology overview; software framework technology for controlling software system complexity; and a roadmap for the enterprise computing technologies.

Textbook:

- ***Programming the World Wide Web, 7th Edition***, by Robert W. Sebesta. Addison Wesley 2011. ISBN-10: 0-13-266581-6.
- ***Instructor class notes***

Learning Objectives and Expected Outcomes

1. Students will master the key language processing concepts and skills, and be able to
   - understand the function of major language processing components include lexical analysis, grammars, parsers, and interpreters;
   - use XML technologies to model and validate business data;
   - implement Web-based GUI with HTML;
   - use XSL and XSLT to transform data from XML to HTML for presentation in Web browsers.
2. Students will master basic database programming skills, and be able to
   - understand the basic concepts and components of relational databases;
   - understand basic SQL language features for creating tables, inserting/deleting data into tables and making inquiries through JDBC;
   - design and implement Java applications based on both ACCESS and MySQL databases.
3. Students will master the networking fundamentals, and be able to
   - understand the layered network architecture and fundamental properties of TCP/IP;
   - understand and conduct multi-thread programming and thread synchronization;
   - use the socket abstraction to implement simple client/server applications.
4. Students will master the fundamental Web application architecture and concepts, and be able to

- o jusify the tiered web architecture;
- o understand HTTP requests/responses and HTML form processing;
- o use servelts to implement a simple Web application on the Tomcat;
- o understand the proxy design pattern underlying all remote method/function invocation technologies, and redo an existing Web application as a web service on Tomcat.
5. Students will master the importance and fundamental concepts of software framework based programming, and be able to
    - o explain the relationship among object-oriented programming, component-based programming, and service-oriented architecture;
    - o understand the design and implementation of a simple software framework for networking;
    - o redo an existing networking application with a simple software framework to see how we can hide networking and multithreading from programmers.
6. Students will get the roadmap of the Internet computing, and be able to
    - o understand the fundamental concepts of cluster-based computing and grid computing;
    - o understand fundamentals of server-based computing technologies;
    - o understand fundamentals of service-oriented computing;
    - o write a simple parallel program in Java that can run on a cluster of PCs.

Bi-Weekly Course Assignments

Every two weeks, read post *What to Do Weeks X and (X+1)* (normally the first post) under **Discussion Board|WeeksXand(X+1)** (X will be replaced by a number) to see which tasks you need to finish for the two weeks. The bi-weekly assignments will cover reading assignments, discussion questions and (individual) project assignments. The bi-weekly course assignments will be posted on the Sunday of the first week of the period. Unless otherwise specified, all the tasks specified in a course assignment must be completed within the same two-week period and submitted by the Sunday at the end of the two-week period. There are deadlines for assignment submission (including answering discussion questions) that will be strictly enforced. Each working day after the submission deadline would incur a 10% penalty on the assignment's grade. All files for a period's assignment should be zipped into a single file and submitted by attaching the solution zip file in a public reply message to the proper assignment thread in the **Discussion Board**.

Midterm and Final Exams

There will be a one-hour online midterm exam on October 18, 2014 and a two-hour online final exam on December 12, 2014 covering fundamental concepts of the course.

Grading Scheme

Assignments	60%
Midterm	20%
Final Exam	20%

Course Virtual Machine

This course uses a VMware Linux virtual machine (VM) for most hands-on labs so you can have the same lab environment at University Labs and your home. The information on how to obtain and set up

these two VMs is in file "course-vm-setup.pdf" in Blackboard folder "Course Documents". You need to use a PC with at least one GB memory and at least 20 GB free disk space to run the VMs. You can hold the VM folder on a portable disk, like a 16-32 GB USB flash drive, and work on the same virtual labs on any PC that has the free VMware Player installed. Most Pace Seidenberg School lab PCs have *VMware Player* installed so you can run your VMs.

If you took summer courses with me this year, then you can use the same VM for this course.

CSIS School Policy Regarding Academic Integrity

1. Definition.

   Students must accept the responsibility to be honest and to respect ethical standards in meeting their academic requirements. Integrity in the academic life requires that students demonstrate intellectual and academic achievement independent of all assistance except that authorized by the instructor. The following constitute academic dishonesty. The list is not inclusive.

   a) Exams
      i) Copying from another student's exam.
      ii) Deliberately allowing other students to see and copy from your exam.
      iii) Using notes or calculators without permission from the professor or proctor.
      iv) Passing notes or calculators to other students without permission.

   b) Papers and projects
      i) Copying others' writing without proper reference.
      ii) Copying code or work from other students outside a team environment. This could be either from printouts and notes or from electronic media. This includes copying the structure of a program while changing cosmetic details such as identifiers and comments.
      iii) Deliberately allowing other students to copy your code or work, again either from printouts, notes or from electronic media. (This does not preclude a student "helping" another on a project as long as it is limited to giving information/hints and not code/solutions.)
      iv) Submitting a paper, program, or project that was done by someone else.
      v) Collaboration with one or more other students without the prior permission of the instructor.

2. Consequences. The following consequences will be affected:

   a) The first student offense may result, at the discretion of the instructor, in penalties including a zero on the offending course work or an F for the offending course.
   b) The second student offense in any course may result in an F for the offending course.
   c) The third student offense in any course may result in dismissal from the University.
   c) The Dean's office shall keep a student record of all student offenses occurring in courses offered by the School of CSIS including the first offense. This record should be destroyed when the student graduates from the University. The record shall be associated with the student and not with any particular course.

3. Procedures for determining an offense. The following procedure will be used:

   a) If the student admits to the offense, the appropriate penalty shall be enforced.
   b) If the student contests the charge, the Chair of the department in which the course was offered will make a decision as to the facts of the case. If the professor is also the Chair, this step could be skipped.
   c) If the student disagrees with the Chair's decision, he or she may request a hearing from the *Undergraduate* or *Graduate Scholastic Standing Committee*, depending upon the student's status. The Committee shall make a recommendation to the Dean concerning the facts of the case.
   d) Both the professor and the student may submit to the Committee relevant information in writing. The professor and/or the student may also appear before the committee, but usually not concurrently. No others may attend the Committee hearing, but the Committee may also consider the written statement of witnesses and other concerned persons.
   e) The decision of the Dean shall be final.
   f) A confirmed student offense shall be entered into the student's record in the Dean's office.