CIS 3287 Software Design/Practicum

Course: CIS3287
Course Title: Software Design/Practicum
Time: MWF 1:00 – 1:50 M (Lab) 9:00 – 10:50
Place: MWF TL403B M (Lab) CC 207
Instructor: Paul Wolfgang
Instructor Phone: 215-204-5155
Office Hours: M 4:00 – 5:00 W 10:00 – 10:50 & 4:00 – 5:00 F 10:00 – 10:50
Course Web Page: www.cis.temple.edu/~wolfgang
Prerequisites: C or better in:
   CIS 2168      Data Structures
   CIS 3207      Introduction to System Programming and Operating Systems
Textbooks:
   Flexible, Reliable Software Using Patterns and Agile Development
   Christensen
   CRC Press

   Object-Oriented Design & Patterns
   Horstmann
   John Wiley & Sons.
   ISBN: 978-0-471-74487-0

   Java Power Tools
   Smart
   O'Reilly
   ISBN: 978-0-596-52793-8

\(^1\) Available on line through the Temple Library

References
   Beautiful Code
   Oram & Wilson
   O'Reilly
   ISBN: 978-0-596-51004-6

   Pragmatic Unit Testing in Java with JUnit
   Hunt & Thomas
   The Pragmatic Book Shelf
   ISBN: 978-09745140-1-7
JUnit in Action, 2nd Ed
Tahchiev, Leme, Massol, & Gregory
Manning Publications Co.
ISBN: 9781935182023

Head First Design Patterns
Freeman & Freeman
O'Reilly
ISBN: 978-0-596-00712-4

Test-Driven Development by Example
Beck
Addison-Wesley

Growing Object-Oriented Software, Guided by Tests
Freeman & Pryce
Addison-Wesley

Refactoring Improving the Design of Existing Code
Fowler
Addison-Wesley
ISBN: 978-0-201-48567-7

Version Control with Subversion
Pilato, Collins-Sussman, & Fitzpatrick
O'Reilly
ISBN: 978-0-596-51033-6

Mercurial: The Definitive Guide
O'Sullivan
O'Reilly
ISBN: 978-0-596-801311

1 Available on-line through the Temple Library
2 Available on-line from http://svnbook.red-bean.com
3 Available on-line from http://hgbook.red-bean.com/read/

Course Description
Provides direct experience in the design, development, documentation, testing and maintenance of medium size software projects, in the use of modern software problem solving abstractions and solution patterns, and in the use of software development environments. This course is the capstone of the programming course sequence.

Course Goals:
To introduce the students to the following topics and to demonstrate their practical application.
• Graphic User Interface  
• Access to Database  
• Remote Procedure Calls (RPC)  
• Extensible Markup Language (XML)  
• Threading  
• Object Oriented Design  
• Unified Modeling Language (UML)  
• Design Patterns  
• Test Driven Development  

To provide practical experience in using modern software development tools to perform the following tasks  
• Project Management  
• Version Control  
• Build  
• Test  
• Issue Tracking  

Provide experience working in small teams working on a project to modify an existing open-source program. Most Projects and code will start from or be inspired by:  
• Sourceforge projects  
• Apache Software Foundation projects  
• Google Summer of Code  

Grading:  
• 10% Weekly quizzes - Brief in class quizzes to verify that students learn the material  
• 20% Homework/Lab - Small assignments intended to make student practice with the concepts and tools presented  
• 15% Midterm  
• 30% Final Project - Six week long project done in small teams  
• 25% Final Exam  

Exam Dates:  
• Midterm: Monday, October 10, 2011  
• Final: Monday, Friday, December 16, 2011 10:30 – 12:30  

Attendance Policy:  Attendance is mandatory. Unexcused absence will result in reduction of final grade.  

Project  
The goal of the project phase of this course is for students to gain experience in contributing to an open-source project. The nature of the contribution may be to contribute an enhancement or to fix an open problem. Students may work alone or in a team of up-to 3 students. While project work will be concentrated to the last half of the course, you need to select the project early and join the developer’s mailing list. A written project proposal is due Monday, September 19. This will contain:  
• A one paragraph description of the overall project  
• A one paragraph description of your proposed contribution
• A URL reference to the project.

Note: contributing to an open-source project is preferred. You may propose a stand-alone project, but if you do, it must be submitted as an open-source project.

Sources of open-source projects:

• Apache software foundation
  – http://www.apache.org/

• Open-Office
  – http://www.openoffice.org/

• Source-Forge
  – http://sourceforge.net/

• Open Hatch
  – http://openhatch.org/

Other Important Information

Disability disclosure:
Any student who has a need for accommodation based on the impact of a disability should contact me privately to discuss the specific situation as soon as possible. Contact Disability Resources and Services at 215-204-1280 in 100 Ritter Annex to coordinate reasonable accommodations for students with documented disabilities. (Temple University Policy and Procedures Manual)

Academic freedom:
Freedom to teach and freedom to learn are inseparable facets of academic freedom. The University has a policy on Student and Faculty and Academic Rights and Responsibilities (Policy #03.70.02) which can be accessed through the following link: http://policies.temple.edu/getdoc.asp?policy_no=03.70.02.

Academic Honesty
Academic cheating (such as plagiarism, copying during an exam, copying homework, stealing files and passwords, etc.) is strictly prohibited in this course. The penalty for the first offense will normally be an F in the course. A subsequent offense (in this or any other course) may also be referred to the University Disciplinary Committee.

No collusion what-so-ever during an exam will be tolerated. In particular not talking or other sharing of information (for example during open book exams) is permitted. Keep your eyes on YOUR paper.

IGNORANCE OF ACCEPTABLE GUIDELINES OF CONDUCT IS NO EXCUSE

http://policies.temple.edu/getdoc.asp?policy_no=03.70.12
Dates to Remember

First Day of Class: Monday, August 29, 2011

Last Day to Drop: Monday, September 12, 2011

Project Proposals: Monday, September 19, 2011

Mid-term Exam Monday, October 10, 2011

Last Day to Withdraw*: Monday, October 31, 2011

Thanksgiving Break: November 24 & 25, 2011

Last Day to makeup labs: Monday, November 7, 2011

Last Day of Class: Wednesday, December 7, 2011

Final exam Friday, December 16 (10:30 – 12:30)

* Students may withdraw from or repeat a course only once.
# Lecture and Lab Schedule

The lectures will be based on the Christensen text and on other sources.

<table>
<thead>
<tr>
<th>Week</th>
<th>Date (Monday)</th>
<th>Lecture Topics</th>
<th>Quiz/Exam</th>
<th>Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8/29/2011</td>
<td>Introduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Test Driven Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unit Testing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Christensen Chapter 5</td>
<td></td>
<td>Lab 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Account Setup</td>
<td></td>
<td>Practice with IDE, version control</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Quiz/Exam</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>9/5/2011</td>
<td>Build Tools</td>
<td>Quiz 1</td>
<td>No Lab (Labor Day)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Polymorphism,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interfaces and Subclasses,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Strategy Pattern</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Christensen Chapters 6 – 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horstmann Chapter 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>9/12/2011</td>
<td>Threading and Concurrency</td>
<td>Quiz 2</td>
<td>Lab 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horstmann Chapter 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>9/19/2011</td>
<td>PROJECT PROPOSALS DUE</td>
<td>Quiz 3</td>
<td>Lab 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>XML</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RPC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>9/26/2011</td>
<td>Design Patterns</td>
<td>Quiz 4</td>
<td>Lab 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The State Pattern</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Christensen Chapters 9 - 11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>10/3/2011</td>
<td>Advanced Unit Testing</td>
<td>Quiz 5</td>
<td>Lab 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mock Objects</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Test Stubs</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Christensen Chapter 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horstmann Chapter 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>10/10/2011</td>
<td>Review of Mid-term</td>
<td>Mid-term Exam</td>
<td>Lab 5</td>
</tr>
<tr>
<td>8</td>
<td>10/17/2011</td>
<td>Compositional Design</td>
<td></td>
<td>Lab Makeup</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Christensen Chapters 15 - 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>10/24/2011</td>
<td>Pattern Catalogue</td>
<td>Quiz 7</td>
<td>Project</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Christensen Chapters 19 - 29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>10/31/2011</td>
<td>Event-Oriented Programming</td>
<td>Quiz 8</td>
<td>Project</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horstmann Chapter 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>11/7/2011</td>
<td>Frameworks</td>
<td>Quiz 9</td>
<td>Last day to make-up labs. Project</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Christensen Chapters 30 – 32</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Horstmann Chapter 8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>11/14/2011</td>
<td>Database Access</td>
<td>Quiz 10</td>
<td>Project</td>
</tr>
<tr>
<td>13</td>
<td>11/21/2011</td>
<td>Dynamic Code Generation and Image Processing</td>
<td>Quiz 11</td>
<td>Project</td>
</tr>
<tr>
<td>14</td>
<td>11/28/2011</td>
<td>Domain Specific Languages</td>
<td></td>
<td>Project</td>
</tr>
<tr>
<td>15</td>
<td>12/5/2011</td>
<td>Last Class (Review)</td>
<td></td>
<td>Project</td>
</tr>
<tr>
<td>16</td>
<td>12/12/2011</td>
<td>Final Exam</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>