Course Description

An introduction of principles and methodologies of good software design. Study of object-oriented concepts and techniques, encapsulation, inheritance mechanisms, polymorphism, and programming in one or more object-oriented languages. Examination of design patterns that provide reusable solutions to problems in object-oriented design.

Schedule

CS 4773: Mon./Wed./Fri. 12:00-12:50pm in BB 3.01.12

Instructor

Instructor: Dr. Jeffery von Ronne
Phone: 210-458-5667
Email: vonronne@cs.utsa.edu
Office Location: S.B. 4.01.14
Office Hours: TBD

Textbook


In addition, students should obtain a copy of Arnold, Gosling, and Holmes’s *Java Programming Language* (2005) or another reference for the Java language.

Metsker and Wake’s *Design Patterns in Java* is recommended as a alternative source for the study of design patterns.

Electronic Resources


Course Outline

Course time will be split, between, discussion of topics and discussion of project iterations.

Planned Discussion Topics by Week:

1. Introduction / Orientation
2. Iteration Planning and Test Driven Development
3. Refactoring
5. Liskov Substitution Principle, Dependency-Inversion Principle
6. Interface Segregation Principle
7. Midterm, Command and Active Object design patterns
8. Template Method and Strategy design patterns, Facade and Mediator design patterns
9. Singleton and Monostate design patterns, Null Object design patterns,
10. Principles of package design, Factory Design Patterns,
11. composite design pattern
12. observer, abstract server, adapter, and bridge design patterns
13. proxy and stairway to heaven design patterns, Visitor design pattern
14. State design patterns
15. ETS case study; project debriefing; and review

Grading

Final grades will be assigned using the weighted average of the following components:

- Quizzes: 10%
- Participation: 25%
- Project: 25%
- Midterm Exam: 20%
- Final Exam: 20%

A total score of 90% will earn an ‘A,’ a total score of 80% will earn at least a ‘B,’ a total score of 70% will earn at least a ‘C,’ and a total score of 60% will earn at least a ‘D’. The instructor reserves the right, however, to lower the thresholds if the instructor determines that to be appropriate in order to calibrate the grading to the learning objectives and course difficulty.

Attendance and Participation

A significant amount of class time will be devoted to group activities. To receive full participation points, students must attend class regularly, be prepared for class (including completing assigned readings and homework in advance), participate in class and group discussions/activities, and actively contribute to group work (in and out of class).

Students will be considered to attend classes regularly if they have less than five absences or if their absences do not exceed 1/6 of the class meetings at which attendance is taken. Students will not be penalized for absences due to participation in university sanctioned activities. The instructor will not otherwise differentiate between unexcused and excused absences. Students who are more than five minutes late may be considered absent for the class.

Each student’s lowest two quiz score will be dropped. No other accommodation for missed quizzes will be given unless more than two quizzes are missed due to a serious illness or university sanctioned absences.

Prerequisites

Students are assumed to already be familiar with the core goals and techniques of Software Engineering and have an ability to program in Java using object-oriented constructs. They should have this background if they have completed the prerequisites of:

- CS 3773: Software Engineering

and its prerequisite of:

- CS 2123 and 2121: Data Structures
Course Goals

As a result of taking this course, students should:

1. be able to explain several principles of good object-oriented design
2. be able to develop, analyze, and critique object-oriented designs in respect to general principles of good object-oriented design
3. be able to analyze design patterns in light of object-oriented design principles
4. be able to apply object-oriented design principles and patterns to solve a realistic software design problem
5. be able to work as part of a team to develop and implement a design for a moderately sized object-oriented system

Important Dates

The time and place of final examinations for organized courses are given in the university’s Final Examination Schedule. The schedule is to be followed as announced, with final examinations given on the dates and at the times when they are scheduled and in the places where they are scheduled.

The final exam for CS 4773 in Spring 2010 is scheduled for 1:30pm on Tuesday, Dec. 14, 2010.

One in-class exams will be held during the semester. This is tentatively schedule for October 4, 2010.

Projects

Team projects will be completed iteratively in multiple phases. Each iteration will be graded with respect to what is complete as of the iteration’s deadline. Grades for group project will be based primarily on the group product but may be adjusted based on an assessment of the individual contribution to the group project. The expectation is that each student will contribute 15-20 hours of effort during each three-week iteration of the group projects.

Makeup Examinations and Incomplete Grades

Makeup examinations and grades of Incomplete will only be considered by the instructor if there are serious extenuating circumstances (such as hospitalization or death of an immediate family member) that are beyond control of the student. Such circumstances need to be documented and discussed with the instructor as early as possible.

Student who miss more than 1/4 of the sessions in a semester are ineligible for an incomplete. Makeup exams may be in a different format and/or harder than the exam that is being made up.

Scholastic Dishonesty

Generally, in this course, students will be allowed to collaborate in groups on homework assignments as long as they acknowledge with whom they have worked on each assignment. The specific instructions for any particular assignment, however, takes precedence over this general prescription.
In any case, it is not acceptable to simply copy solutions from any source (e.g., other students, web pages), or paraphrase such solutions without acknowledging the source from which the solution came.

The Office of Student Judicial Affairs or faculty may initiate disciplinary proceedings against any student accused of scholastic dishonesty. “Scholastic dishonesty” includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, and any act designed to give unfair advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor, providing false or misleading information in an effort to receive a postponement or an extension on a test, quiz, or other assignment), or the attempt to commit such an act.

Please refer to Student Code of Conduct in the Information Bulletin (http://www.utsa.edu/infoguide/appendices/b.html) for more information on student responsibilities and potential penalties for violations.

Disability Services

Academic accommodations are services that provide equal educational opportunities for students with disabilities. They are provided on an individual basis and determined by documented need. Students with disabilities who wish to request services or accommodations at UTSA should first consult with Disability Services to determine what accommodations are appropriate. After the appropriate accommodations are determined, students contact the instructor as soon as possible to make any necessary arrangements.

For more information, please refer to:
http://www.utsa.edu/disability/students.htm

Notice of Contingency

This syllabus is provided for informational purposes regarded the anticipated course content and schedule of this course. It is based upon the most recent information available on the date of its issuance and is as accurate and complete as possible. The instructor reserves the right to make any changes he deems necessary and/or appropriate. The instructor will makes his best efforts to communicate any changes in the syllabus in a timely manner. Students are responsible for being aware of any such changes.