CSE 5324 - Software Engineering: Analysis, Design, and Testing

Fall 2011, Section 001, Class Number 82249

1 Instructor

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2 Section Information

- CSE 5324, Section 001

3 Time and Place of Class Meetings

- Time: Monday and Wednesday, 5:30 pm - 6:50 pm
- Location: NH 229 (in Nedderman Hall)

4 Description of Course Content from Course Catalog

Motivations, principles, and goals of software engineering; technical aspects of software projects, including: review of structured analysis and structured design, emphasis on object-oriented methods of requirements analysis and specification, design, and implementation; software testing concepts; team project.

5 Student Learning Outcomes

Students will be able to create, explain, and critique software products. In order to reach these outcomes, students will

- specify, design, implement, and test an object-oriented application
- present deliverables
- review deliverables of other teams

For each of the above tasks, students will use a language, tool, or technique that is being widely used in industry, i.e.,

- the unified modelling language, including use-case, sequence, and class diagrams
- the programming language Java
- the integrated development environment Eclipse
- the test automation framework JUnit

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6   Prerequisites

- Undergraduate algorithms and data structures.

- Undergraduate discrete mathematics (set, relation, function, graph) and first-order logic.

- Undergraduate programming in Java or a similar language.

7   Requirements

Student team meetings in addition to regular class meetings, as scheduled by the team members.

8   Required Textbooks and Other Course Materials

Required:

1. Craig Larman: Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and Iterative Development. 3rd edition. Prentice Hall, 2004. Also available online at http://libproxy.uta.edu:2161/0131489062

2. James Gosling, Bill Joy, Guy Steele, and Gilad Bracha: Java Language Specification. 3rd edition. Addison Wesley, 2005. Also available online at http://java.sun.com/docs/books/jls/

Recommended (but not required):

1. Barbara Liskov and John Guttag: Program Development in Java: Abstraction, Specification, and Object-Oriented Design. Addison Wesley, 2001.

2. Steve McConnell: Code Complete: A Practical Handbook of Software Construction. 2nd edition. Microsoft Press, 2004.

3. Shari Lawrence Pfleeger and Joanne M. Atlee: Software Engineering: Theory and Practice. 4th edition. Prentice Hall, 2009.

4. Frederick P. Brooks: The Mythical Man-Month: Essays on Software Engineering. 2nd edition. Addison-Wesley, 1995.

5. Kenneth H. Rosen: Discrete Mathematics and its Applications. 6th edition. McGraw-Hill, 2007.

6. Bertrand Meyer: Object-Oriented Software Construction. 2nd edition. Prentice Hall, 2000.

7. Erich Gamma, Richard Helm, Ralph Johnson, and John Vlissides: Design Patterns: Elements of Reusable Object-Oriented Software. Addison-Wesley, 1995.

8. Joshua Bloch: Effective Java. 2nd edition. Prentice Hall, 2008.

9. Grady Booch, James Rumbaugh, and Ivar Jacobson: The Unified Modeling Language User Guide. 2nd edition. Addison-Wesley, 2005. Also available online at http://libproxy.uta.edu:2161/0321267974

9   Descriptions of Major Assignments and Examinations

Following is the tentative outline. I will announce concrete dates in class.

- Homework: Throughout the course.

- Quizzes: Throughout the course.

- Project: Throughout the course.

10   Grading

- 10% homework

- 20% quizzes

- 10% class participation

- 30% project specifications, designs, code, tests, reports, etc. (written)

- 10% project reviews (written)

- 20% project presentations (oral)

10.1   Grade Distribution

A from 85%, B from 70%, C from 60%, D from 50%, else F.

10.2   Late Policy

Late submissions will be accepted until we discuss results. For being late up to one day the penalty is 10%, for up to two days it is 20%, etc.

10.3   Homework

Goal: Individually practice using a tool that will later be used in the project.

We will have two or three homework assignments. Each will focus on applying a software engineering tool discussed in class. I will provide instructions on how to use the tools.

10.4   Quizzes

Goal: Learn basic software engineering techniques and principles that should later be applied in the project.

Quizzes will be announced in class one week in advance. Each quiz will take place in the first 20 minutes of class. Quizzes are closed-book, but you can use a cheat sheet that you have written yourself.

10.5   Project

Goal: Create, explain, and critique software products.

This is a team project. A team consists of three to five students. To make collaboration as easy as possible, I encourage (but not require) you to to use a free open-source project hosting service such as Google Code.

The project consists of, most likely, three iterations. After each iteration, each team will present some aspects of their project, both in writing and by oral presentation. After some iterations, you will formally review the deliverables of other teams. Your reviews and feedback should be probing but always constructive and helpful.

You should distribute project work fairly among yourselves, but I leave the detailed project management to you. The oral presentations are an exception. Here I expect that each team member presents a similar amount of material.

For each project-related deliverable, written or oral, each team will receive a team score. The sum of these team scores will determine the majority of your project-related grade. In addition, for the entire project, each team member will receive an overall individual score. The individual score is derived from peer evaluations, your feedback to other teams during presentations, and your handling of questions.

For the deliverables, I will use the following general grading guidelines, which I copied from Professor Kung.

100–90 points. Proposed solution is adequate and valid and significantly exceeds expectation, the solution is well-organized and clearly described, assumptions are clearly stated.

89–80 points. Proposed solution is definitely adequate and valid, the solution is organized and described, assumptions are stated.

79–70 points. Proposed solution is somewhat adequate and valid, the solution is somewhat organized and partially described, some but not all assumptions are stated.

69–60 points. Proposed solution is only marginally adequate or valid, the solution is poorly organized or difficult to understand, important assumptions are not stated.

59–0 points. Proposed solution is incorrect or far from adequate and valid, the solution is impossible to comprehend.

10.6   Extra Credit: Tool Presentation

Goal: Teach your fellow students how to use a software engineering tool. The tool should be useful for the project or a related software engineering problem.

Pick a software engineering tool and explain how to use it step by step. To provide a better understanding of the tool, you should also explain the basic principles the tool is built on. You may add a comparison with related tools. You should also provide a hand-out that gives detailed instructions on how to use the tool. After your presentation, email me your hand-out (mandatory) and slides (optional). I will post them online. You may also maintain this material elsewhere and just email me a link to it.

Since most of the tools can be used in the project, the presentations are most useful at the beginning of the semester. To encourage early presentations, the maximum amount of extra credit will be 5% after Halloween but 10% before Halloween (October 31).

I will provide a list of suitable tools, but I welcome any suggestions you may have. Following is the web site for the tool presentations: https://wiki.uta.edu/display/serc/CSE-5324+Tools

10.7   Format

All written deliverables (homework, hand-outs, project reports, etc.) should be in plain text, HTML, or PDF, unless I announce otherwise.

11   Attendance

See the Graduate Catalog:
    http://www.uta.edu/gradcatalog/2012/general/regulations/#h2

12   Drop Policy

See the Graduate Catalog:
    http://www.uta.edu/gradcatalog/2012/general/regulations/

13   Americans With Disabilities Act

The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the Americans with Disabilities Act (ADA). All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies

for obtaining disability-based academic accommodations can be found at http://www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

14   Academic Integrity

At UT Arlington, academic dishonesty is completely unacceptable and will not be tolerated in any form, including (but not limited to) "cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts" (UT System Regents Rule 50101, Section 2.2). Suspected violations of academic integrity standards will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University. See:

http://www.utsystem.edu/BOR/rules/50000Series/50101.pdf

15   Student Support Services

UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may contact the Maverick Resource Hotline by calling 817-272-6107, sending a message to resources@uta.edu, or visiting http://www.uta.edu/resources.

16   Electronic Communication

UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at http://www.uta.edu/oit/cs/email/mavmail.php.

17   Mailing List

For this course we are using the mailing list CSE5324-CSALLNER@listserv.uta.edu. I expect you to subscribe to this mailing list and read the emails that are distributed over the mailing list. You can find the mailing list in the Public List Archives at http://listserv.uta.edu/. The mailing list will be our main communication channel for homework assignments, clarification questions, etc.

18   Make-up Exams

See the Graduate Catalog at http://www.uta.edu/gradcatalog/2012/general/regulations/#absences:

"Students will be allowed an excused absence under circumstances described below. The student must notify the instructor in writing at least one week in advance of the start of the excused absence and arrange with the instructor to make up missed work or missed examinations. Instructors will allow students an opportunity to make up the work and examinations within a reasonable time period following the absence or otherwise adjust the grading to ensure that the student is not penalized for the absence, provided that the student has properly notified the instructor.

Instructors are under no obligation to accommodate students who are absent or miss work without prior notification and make-up arrangements. Students who have properly notified the instructor, will not be penalized for the absence. However, the instructor may respond appropriately if the student fails to

complete the assignment or examination satisfactorily within the time limit following the absence set by prior arrangement."

19   Grade Grievances

Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current graduate catalog. See:

  http://www.uta.edu/gradcatalog/2012/general/regulations/#grades

20   Student Feedback Survey

At the end of each term, students enrolled in classes categorized as lecture, seminar, or laboratory will be asked to complete an online Student Feedback Survey (SFS) about the course and how it was taught. Instructions on how to access the SFS system will be sent directly to students through MavMail approximately 10 days before the end of the term. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback data is required by state law; student participation in the SFS program is voluntary.

21   About This Syllabus

This syllabus is based on the syllabus template provided by the provost (https://mavspace.uta.edu/departments/provost/public/syllabus-template.doc) and the "Tips for developing Student Learning Outcomes", which is also provided by the provost (https://mavspace.uta.edu/departments/provost/public/outcomes-tips.pdf).