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|  | **CPE 333 Software Engineering (semester 2/2014)**  *Hands-on, Active Learning Edition*  Computer Engineering Department  King Mongkut’s University of Technology Thonburi |

**Instructors**

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**Text Book**

*Software Engineering: A Practitioner’s Approach*. 8th Edition.Roger S. Pressman. McGraw-Hill. 2015.

**Tools**

1. A Design Tool (Visual Paradigm)
2. A Testing Tool (Mercury Quick Test)
3. A Project Management Tool (MS-project, Redmine)
4. A Software Configuration Management Tool (SVN)
5. A GUI creation Tool (Balsamiq)

**Score Distribution**

* Quizzes and Labs 15
* Term Project (group of 5) 45
* Midterm 20
* Final 20

**Evaluation**

* Quizzes to self-check on learning of a previous lecture
* Midterm and Final Exams
* Lab work on tools usage
* Term Project Report for groups of 5 students. Presentation skill will be considered in the grading

**Weekly Plan**

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| **Lecture** | **Lab/Problem/Activity** | **Instructor** |
| 1. Introduction on software process. Agile (XP, Scrum), Waterfall, RUP, Spiral. Jan 7. |  | Suthep |
| 2. Product metrics and cost estimation. Jan 12. | Cost Estimate Problem. Jan 14. | Suthep |
| 3. Requirement analysis: scenarios and information. Jan 19. | UML Tool introduction. Jan 21. | Tiranee |
| 4. Requirement analysis: behavior and patterns. Jan 26. | UML Use case/activity/sequence diagrams. Jan 28. | Tiranee |
| 5. Development Process Practice. (PSP) Feb 2. | Redmine practice. Feb 4. | Tiranee |
| 6. Software Design Concepts. Feb 9. | UML Class Diagram, Component Diagram, State Machine Diagram Tutorial. Feb 11. | Marong |
| 7. Architectural Design. Feb 16. | Use Component Diagram. Feb 18. | Marong |
| 8. Component Based Design, User Interface Design. Mar 9. | Use Class Diagram and Activity Diagram. Mar 11. | Marong |
| 9. Pattern Based Design and Web Application Design. Mar 16. | Conceptual Design of the project. Mar 18. | Marong |
| 10. GUI Design Concept. Mar 23. | Creating UI with Balsamiq. Mar 25. | Tiranee/Guest |
| 11. Software testing: practical approach. Mar 30. | Testing real software using tool. Apr 1. | Tiranee/Guest |
| 12 Software configuration management. Apr 8. | Configuration Management Tool using SVN. Apr 20. | Suthep |
| 13. Project management. Apr 22. | Microsoft Project. Apr 27. | Suthep |
| 14. Software development standards. Apr 29. |  | Suthep |
| 15. Final Project Presentation. May 4. | Final Project Presentation. May 6. | Tiranee/Suthep/Marong |

**Term Project Reports (All reports should be submitted electronically in PDF format)**

The Objectives of the Term Project include:

* + Encourage ***collaboration*** through working together in a group.
  + Simulate a real system development project
  + Familiarize students to software engineering documents and processes involved in a real software development environment.

Students will work continuously on the project throughout the semester, not just at the end of the semester. Each team is required to submit various documents for detailed design in the course. A rough schedule for submission of the term project report is given below. The total points on the Term Project will be weighted to 35% of your grade.

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| **Week 1** | **Team Signup**. Students form a group of 5 students (maximum). |
| **Week 2** | *20 points.* **Topic Proposal**. Each group will submit a 1-page summary of the proposed work (overview and objectives). The project size should not exceed approximately 8-12 equivalent database application line-item forms or about 3 person months of required coding time. |
| **Week 3** | *70 points.* **Project Plan Document**. Each group will submit a plan that includes project schedule and milestones, resource management, deliverables, estimated cost (include method to estimate cost), roles and responsibility (~5 pages).  Write your software team’s Process Manual for:   * Project Cost Estimation Method |
| **Week 5** | *100 points.* **Requirements Document**. Each group to submit a document that describes the requirement specifications. The specifications include the needs and conditions to meet for the project (deliverables and constraints). Students should address possibly conflicting requirements from various stakeholders. Note that problem definition should be cleared in this document. Also, requirements should have priority tabulation: must have, should have, could have, won’t have. An example template is given below   * Introduction (problem definition and overview, project scope, objectives, references) * General description (product perspective and functions, user characteristics, assumptions and constraints) * Specific requirements (external interface requirement, functional requirements, performance requirements, etc.) |
| **Week 8** | *100 points.* **Design Document Part I**. Each group submits a document that describes functional and architectural design of the product. The document should also include example user interface for each module. Various UML diagrams should be included. Students can be creative about the report format. An example document can be provided upon request.  Write your software team’s Process Manual for:   * Project Plan and Monitoring Method * Employee Work/Task Assignment Process. This should include a feature to collect data for project monitoring. Each task must have 1 developer and 1 tester) * Final Project Cost Computation Method with Example. Must use an Employee Daily Work Sheets. |
| **Week 12** | *130 points.* **Design Document Part II**. Each group adds more content into “Design Document Part I”. The new content should reflect the detailed design of the project. This document should be detailed enough that a team of developers can understand the product and know how to develop it *without having to ask the designer a lot of questions*. The document should include a database design (with data dictionary), all GUI pages, scenarios and sequence of events, and a detailed behavior of each module. An example document can be provided upon request.  Write your software team’s Process Manual for:   * Requirements and Change Management Process including initial work, defect/bug fixes, and change requests. * Configuration Management Process for all your deliverables including proposal document, analysis/design document, test cases, software code, user manual, technical manual, etc. Special detail must be given for Configuration Management methodology for Source Code version control. * Measures for success in timely delivery of software per project (how much delay?). * User acceptance methodology per component (form/report), module, and entire software project. |
| **Week 15** | *50 points.* **Project Presentation**. Students must also submit a Final Report in compiled book format. |