CSC444F: Software Engineering I

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Syllabus

- The software development process.
- Software requirements and specifications.
- Software design techniques.
- Techniques for developing large software systems.
- CASE tools and software development environments.
- Software testing, documentation and maintenance.

(Prerequisite: ECE344S)

Course Objectives

Goal 1

- to help students to develop skills that will enable them to construct software of high quality – software that is reliable, and that is reasonably easy to understand, modify and maintain

Goal 2

- to foster an understanding of why these skills are important

Teaching Methods

- Lectures (2 per week)
  - …are compulsory
  - …cover core material
- Practicals (1 per week)
  - …last for 3 hours
  - …are compulsory
  - …are used to do term assessments
  - …are used for the team projects
- Team meetings (at least 1 per week)
  - You will need to meet with your team regularly
- (Labs)
  - (There are no regularly scheduled lab sessions)

Timetabling

→ There are 2 lecture sections:

Section A	Section B
Mon 9am MC102	Wed 11am SS2117
Thurs 1pm MC252	Fri 9am MC252

you need to choose one of these!

→ There are 4 practical sections:

	Alpha	Beta	Gamma	Delta
Time:	Mon 4-7pm	Mon 4-7pm	Mon 4-7pm	Mon 4-7pm
Room:	HA403	UC67	SF1101	SF1105

you will be allocated to one of these...

Team Projects

→ Phase 0: Requirements Analysis
- 1 week (10/9 to 14/9)
- We will organize you into teams (≈4 people) at your first practical
- You will receive an initial specification

→ Phase 1: Module Development
- 4 weeks (17/9 to 12/10)
- Each team will implement one of several modules

→ Phase 2: System Integration and Test
- 3 weeks (15/10 to 2/11)
- Each team will integrate its module with modules bought from other teams

→ Phase 3: Software Maintenance
- 4 weeks (5/11 to 30/11)
- Each team will make modifications to a system it has bought from another team

Trading

→ Each tutorial group is a trading block
- You can only buy and sell software within your trading block
- There will be 12 teams within a trading block
  - 3 teams working on each of 4 modules in phase 1
- You will need to work out a strategy both for buying and selling

→ Each team has a bank account
- Your TA operates the bank account for you
- You get an initial balance of S$300 ("software dollars")
- There is a 5% bonus on coursework marks if you end the term in profit
  - (and there is no penalty for making a loss)

→ Each purchase must include a signed contract
- Your TA will not transfer funds between bank accounts without one
  - ... and it must be signed by both parties!
- You can include anything you like in a contract
- There is a mechanism for investigating breaches of contract

Assessments

→ 6 team assignments
- Assignment 1 is worth 5% of your grade
- Assignments 2-6 are worth 10% of your grade each
- All project assignment are team assignments
  - each team hands in one report
- Assignments are handed out during practicals
  - ...and are due in at the *beginning* of the practical two weeks later

→ 2 Presentations
- Each presentation is worth 5% of your grade
- All presentations are team presentations
- In the last two tutorials of term:
  - Each team will give a demo of their system
  - Each team will give a presentation of "lessons learned"

→ 1 Exam
- The end of term exam counts for 35% of the course grade
  - (there is no mid-term exam)

Books

- Main Course Text (Required)
  - Hans van Vliet, "Software Engineering: Principles and Practice (Second Edition)". Wiley
- Other Texts (Recommended)
  - Babara Liskov and John Guttag, "Program Development in Java: Abstraction, Specification and Object Oriented Design". Addison Wesley.
  - Mary Shaw and David Garlan, "Software Architectures: Perspectives on an Emerging Discipline". Prentice Hall
- Background Reading
  - Sections of comp.risks forum
  - I will suggest some other readings during the course

Lecture topics guide

- Phase 0 (1.4 weeks)
  - Week 1
    - Orientation (this lecture)
  - Week 2
    - Motivational Case Studies
- Phase 1 (4 weeks)
  - Week 3
    - Software Processes
    - Software Project Management
  - Week 4
    - Decomposition and Abstraction
    - Procedural Abstraction
  - Week 5
    - Data Abstraction
    - Testing
  - Week 6
    - Reviews & Fagan Inspections
    - Formal verification
- Phase 2 (3 weeks)
  - Week 7
    - Debugging & Exception handling
    - Software quality; modularity
  - Week 8
    - Design Representations
    - Requirements Analysis
  - Week 9
    - Structured Analysis
    - Object Oriented Analysis
- Phase 3 (4 weeks)
  - Week 10
    - Formal Analysis
    - Specifications
  - Week 11
    - Software Architectures
    - Software Maintenance & Reuse
  - Week 12
    - Software Measurement
    - Process Modeling, process improvement
  - Week 13
    - Course wrap-up

Any Questions??

See also: Course web site at http://www.cs.toronto.edu/~sme/CSC444F/