Advanced Software Development

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CS3003S

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What is Software Development?

- Requirements Gathering
- Software Design
- Documentation
- Coding
- Testing
- Bug fixing

Large Teams
6+ month timescales
Maintenance

The Process of Software Engineering

- Software Engineering defined:
  - The establishment and use of effective engineering principles in order to obtain software that is reliable and works efficiently on real machines.
  - The application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software.
- Process:
  - ***Definition*** ("what"): Establish what the requirements of the system are.
  - ***Development*** ("how"): Establish how the system is to be realized – design and build
  - ***Support***: Handle changes as the software environment evolves

Textbooks

From INF2009F: Simon Bennett, Steve McRobb & Ray Farmer, *Object-oriented Systems Analysis and Design Using UML*

Chapter 22 Online: highered.mcgraw-hill.com/sites/0077125363/student_view0/online_chapters.html

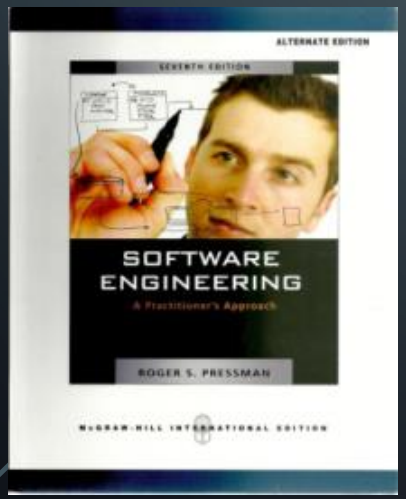
Recommended:

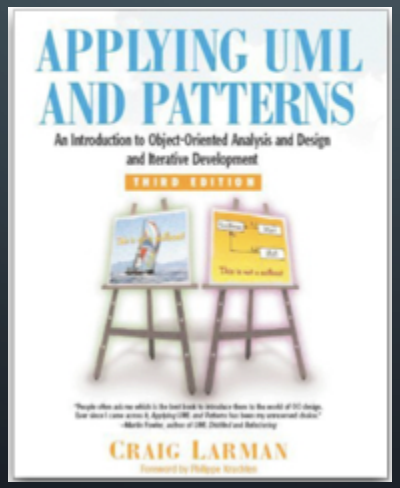
Ian Sommerville, *Software Engineering*, Pearson

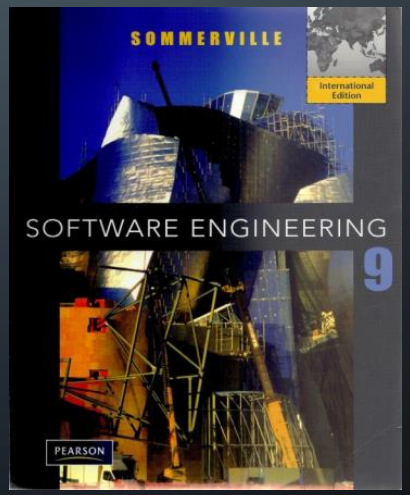
Stephen Schach, *Object-Oriented & Classical Software Engineering*

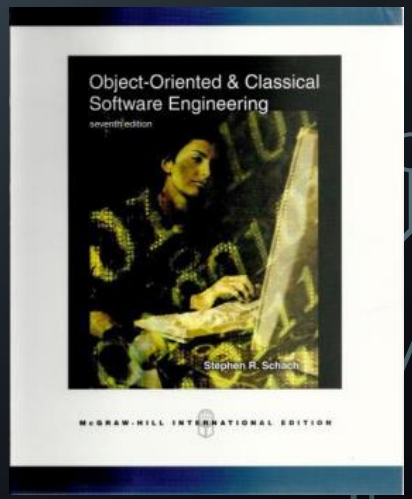
Roger Pressman, *Software Engineering*

Craig Larman, *Applying UML and Patterns: An Introduction to Object-Oriented Analysis and Design and the Unified Process*



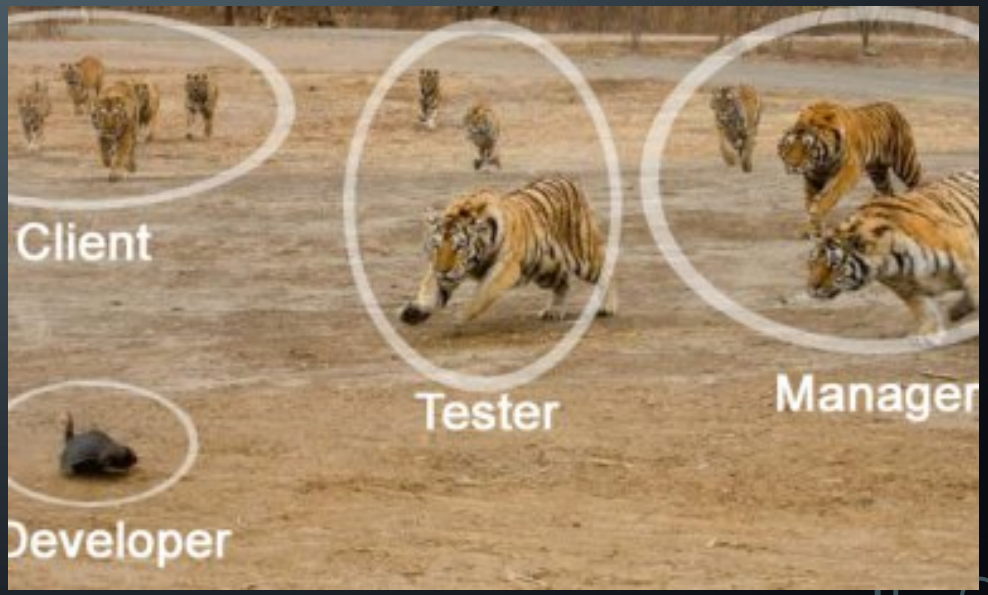






Topics

1. Review O-O & UML
2. Project Management
3. Software Development Methodologies
4. Agile Software Development
5. Software Development with SCRUM
6. Case Study: SCRUM in Game Development
7. UML, Patterns and Architecture
8. Software Architecture
9. Design Patterns
10. Open Source
11. Validation/Verification



Admin

- Please refer to detailed outline posted on Vula
- Consultations (generally straight after class – otherwise organise by email)
- Guest lectures – not to be missed! Generally Thursdays (will make announcements)

Capstone FAQ

- Deliver a working prototype, developed using OO-based software engineering techniques
- Groups of 3, 10 hours per week
- Games students will do their capstone as part of their games project (same deliverables)
- Deadlines are fixed! Don't ask for extensions a week before they are due!

Deliverables

Table 1. Practical Work Schedule (NB: weightings are approximate and may change)

	Course	Assignment	Start	Handin 09:00	Length (hours)		~% Final Mark
	ASD	Stage 0: choice	Mon23/7	Wed 25/7			
1		Stage 1: start up	Fri 27/7	Fri 3/8	10		6.5%
2		Stage 2: planning	Fri 3/8	Fri 10/8	10		6.5%
3		Stage 3: prototype+demo	Fri 10/8	Fri 17/8	10		10%
4		Stage 4: implement & test	Mon 20/8	Fri 7/9	27		44%
5	ToA	ToA 1	Monday and Tuesday 25-26/9				33%
6		ToA 2	Tuesday and Wednesday 1-2/10				
7		ToA 3	Monday and Tuesday 8-9/10				

Class Captain

- We need class reps

Fortnite

- Who's the team?
- How did they accomplish it?
- What's next?

https://www.youtube.com/watch?v=iP9Ajqza6lA

What is version/source control?

- Version control systems are a category of software tools that help a software team manage changes to source code over time.
- keeps track of every modification to the code in a special kind of database
- If a mistake is made, developers can turn back the clock and compare earlier versions of the code to help fix the mistake while minimizing disruption to all team members

Source Control – managing a codebase with lots of (simultaneous) contributors

Distributed

- ex. Mercurial (hg), git
- Work in local repository, synchronize changes later

Centralized (client-Server)

- ex. CVS, Subversion
- Repository exists on a central server, work on clients

track and undo buggy code

web-based hosting service for version control using Git

BitBucket

bitbucket.org

GitHub

github.org

GitLab

gitlab.cs.uct.ac.za

When you use source control

Homework

- Submit your project choice preferences and groups by Wednesday (Vula)
- Do a git tutorial (pick one or two with your team)
  - https://www.atlassian.com/git/tutorials
  - https://try.github.io/levels/1/challenges/1
  - LearnCode Academy https://www.youtube.com/watch?v=0fKg7e37bQE
  - Linus Torvalds on git https://www.youtube.com/watch?v=4XpnKHJAok8
- Review ASD-01-Background.pdf (will put this in Resources)

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