Politecnico
di Milano

Software Engineering 2

Brief description of the course organization

Course objectives

- To offer an overview of the principles and techniques of software engineering
- Topics
  - Software lifecycles, standards, project management and metrics
  - Specification languages
    - Alloy
  - Requirements analysis
  - Software architectures and implementation platforms
    - JEE
  - Validation and verification

… for those who graduated here

- Ingegneria del Software 1 focused on development of small scale OO systems
  - Lifecycles
  - Specification and design of a software module
  - Design patterns
  - Some principles concerning documentation
  - Module verification
  - Configuration management
- Software Engineering 2 more focused on development of complex systems, attention to
  - Requirements engineering
  - Architectural design,
  - All kinds of verification perspectives,
  - Project management, effort estimation

Course style

- This is a **graduate course**
- We require interaction and active participation
  - In class during lectures
  - During the development of a project
- Btw… do not try to study on slides only
- We are experimenting with
  - Innovative and interactive teaching methods
    - “flipped classes”
    - Various forms of projects
  - Interaction with companies during projects (under investigation)

Instructors

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- Exercises
  - Mersedeh Sadeghi (mersedeh.sadeghi@polimi.it)
  - Enrico Gargantini (enrico.gargantini@mail.polimi.it)

- The course schedule is published on the web site
- The two classes proceed (mostly) in parallel

Book and other material

- Hans Van Vliet
  - Software Engineering: Principles and Practice, 3rd edition
- Ghezzi, Jazayeri, Mandrioli
  - Ingegneria del software: Fondamenti e Principi, Pearson Education Italia
  - Fundamentals of Software Engineering, Prentice Hall
- http://beep.metid.polimi.it/
  - Slides, tools, exercises, interesting links, various info on exams, schedule variations, newsgroup and forum

Assessment: rules (tweaked)

- A mandatory project (MP) assigned by us
  - Focus on requirements analysis and design aspects
  - Score from 0 to 16
- One final written exam (WE)
  - Score from 0 to 16
  - Focus on all topics presented in the course
- Or ….
  - The implementation and testing of the assigned project (I&T), or
  - A research-oriented project on some aspects of software engineering (RP)
  - Score from 0 to 16

Assessment: rules (tweaked)

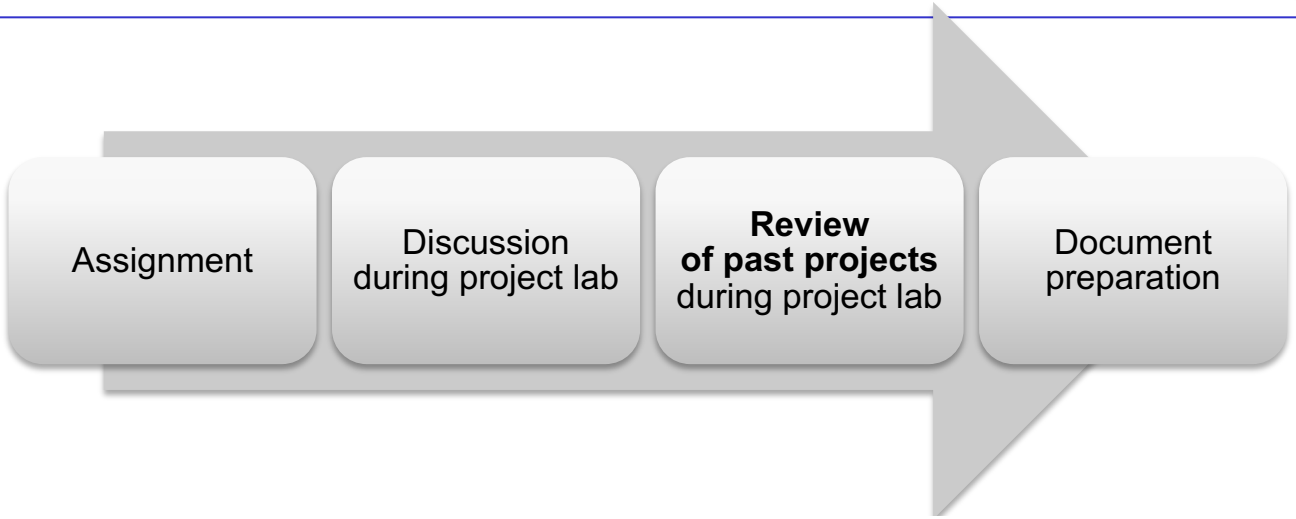
- In summary you can take
  - MP and (WE or I&T or RP)
- Exam is passed if
  - Score(MP) >= 9
  - Score(WE or I&T or RP) >= 9

Mandatory Project

- Objective: to help students apply the approaches and principles we teach in class
- You will autonomously form groups of at most three persons
- Each person in the group can have a specific role (to be declared at the exam)
  - But all have to do some part of each of the assignments (see later)
- Participation at the project lab sessions is strongly recommended

- Another project will be given in April, with **NO ASSISTANCE BY INSTRUCTORS**

Mandatory Project Approach



- We will provide you with an (anonymized) past project, you will look into it offline, and then we will **discuss** its flaws during a lab session
- You will also be asked to fill out a short questionnaire (before the lab) in which you will explain what errors you found.
- Answering the questionnaire with reasonable answers is worth 1 point (of the 16 allocated to the MP)
  - Hence, 2 points can be earned through questionnaires (one for requirements, one for design)

Mandatory Project Approach

- If you need to improve/update your documents after the submission deadline, you can do so, making sure that you document what changes you applied
- All projects will be reviewed during the final presentations at the end of the course
- In summary, the project score is organized as follows:
  - 1 point per questionnaire
  - 14 points for your work (documents and final presentation)

Mandatory Project Phases

- Project assignment 9/10
- Group registration 13/10

- Open discussion on RASD during the project lab of 16/10
- Discussion of past RASDs on 23/10
- RASD submission deadline 10/11

- Open discussion on Design Document 7/11 (Di Nitto), 12/11 (Rossi)
- Discussion of past DDs on 27/11
- Design Document submission deadline 9/12

- Final project presentations (to be scheduled at the end of the course)

Mandatory Project evaluation

- We will assess
  - Quality of the produced artifacts
  - Ability to justify design decisions
  - Ability to explain rationales
  - Ability to coordinate with the other group members
  - Ability to meet the deadlines
  - Presentation

Implementation and Testing Project

- This is allowed only for groups of two or three persons
  - These should be the same groups as for MP!
- It is optional and replaces the written exam
- The focus will be the same of the mandatory project, the goals are to:
  - Achieve a running prototype implementation offering some of the functionality of the project
  - Test your prototype possibly using some of the automation tools that will be presented in class
  - Evaluate through acceptance testing the prototype implemented by another group
- You can choose to continue with the project right after completing MP

I&T Project phases

- Deadline for submitting your I&T deliverable 12/01/2020
- Deadline for submitting your acceptance testing deliverable 19/01/2020
- Final presentation (to be scheduled)

- Evaluation criteria similar to those applied to the mandatory project

Research Project

- To be agreed with your instructors: we will schedule a dedicated meeting for this around mid-October
- No research projects will be available in the Spring semester

- (speaking of research, but unrelated to RP, there are M.Sc. theses available, if you are interested)

Written Exam

- Three to four exercises focusing on all aspects presented in the course
- Previous exams are available on the course website
- During the exam you can use your notes and books
  - The purpose of the course is not to acquire and apply “predefined recipes”, but to get the background needed for building your own approach to the solution!