

CS 4513 B - Software Engineering

(Version 2)
Fall 2018

Instructor's name & title

Professor Strauss, CCP
Department of Computer Science and Engineering
NYU – Tandon School of Engineering

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Office hour

Tuesday 12:30 pm - 1:30 pm
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(or by appointment)

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Teaching assistants/Grader

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Course Information

Course level

Senior

credits

3.0

Class times and location

TU 11:00 am – 12:20 pm – 2MTC 812
TH 11:00 am – 12:20 pm – 2MTC 812

Objectives

To learn software-engineering techniques that can be applied to practical software projects.

- An introduction to software engineering, the software development life cycle, and project management is studied.
- Creative problem discovery, understanding the challenge and idea generation as part of the I2E initiative. Tools for generation and tools for focusing discussed and used to select team projects
- Software requirements and specification methods including software architecture, analysis and specification, and prototyping are described.
- Software design techniques for Object-Oriented, function-based and real-time systems to design and build software are explored.
- Software reliability and software life cycle support processes including testing (verification and validation), software reviews, configuration management, and defect detection and correction strategies are studied.
- Software project management, process improvement, and quality are studied as the basis for project oversight and tracking.
- A class project utilizing the Personal Software process is used to demonstrate the software engineering processes and life cycle. Oral presentation skills and formal project presentation.

Methods of Instruction

The primary method of instruction is lectures supplemented with related assignments, readings, and projects

General Content

This is the first course in a two-course design sequence (DP I and DP II) with a focus in software engineering. This course introduces the software engineering techniques to specify, design, test and document medium and large software systems. Creative problem discovery techniques and processes are used for

project selection in a team environment. Design techniques include Information engineering, object-oriented, and complexity measures; testing methods such as path testing, exhaustive test models, and construction of test data. An introduction to software tools and project management techniques is presented. Student projects involve team software development and tracking, and a formal oral presentation.

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The primary method of instruction is lectures supplemented with related assignments, readings, and projects

Project Presentation

Each project team is required to delivery a formal in class presentation describing the technical details and processes (covering the system life cycle from idea generation to requirements elicitation through design documentation). The presentation delivery, format, and content should be based on material covered in a presentation preparation course (EG at Poly or other course such as public speaking). Presentation skills will be reviewed in the oral presentation skills lecture. Presentation worksheets will be distributed to assist teams in the development of their presentations. Each team members is expected to participate in the presentation. Presentation details are:

- Type: Formal presentation
- Participation: All team members must participate (10 minutes/member)
- Audience: Instructor (acting as project manager), class
- Dress: Informal/casual
- Format/Media: PowerPoint or other delivery mechanism (i.e. Web based)
- Content:
 - Overview, team member introductions
 - Project process/management
 - Requirements (Use Cases, written requirements)

- Analysis (Classes, static and dynamic behavior)
- Design (detailed design using UML, architecture)
- PIR (what did we do right? What did we wrong? What would we do differently?)
- Conclusions
- Open question/Answers – Instructor and class
- Submission: Presentations are to be posted to the team assignment menu on NYU Classes

Textbooks, Readings, materials

Textbook

Braude, Bernstein, “Software Engineering: Modern Approaches, 2nd ed, Waveland Press, 2011, ISBN: 978-1478632306

Creative exercises and Supplemental Material

Will be posted on NYU Classes

Supplementary readings

Kruchten, Philippe - The Unified Process – An Introduction, Addison Wesley Longman, New York, 1999.

Rubin, Kenneth - Essential Scrum, Addison Wesley, New York, 2013

Cohn, Mike – Succeeding with Agile, Addison Wesley, New York, 2013

Humphrey Watts S., Introduction to the Personal Software Process, SEI Series in Software Engineering, Addison Wesley Longman, New York, 1997.

Course Policies
(Additional Policies posted at my.poly.edu)

Attendance/lateness

Students are expected to attend lectures. Attendance is required. In case of absence, the student is responsible for the material covered during that lecture. Absence from exams will be accepted **only** if the student notified prior to the exam with an acceptable reason. A make-up exam will be given only for the exams not for quizzes.

Class participation

Class participation includes actively engaging in class dialog and discussions and formal oral presentations.

Exams and Assessments

Examinations

A midterm exam and final exam will be given as shown on the schedule. The midterm exam covers material from the beginning of the semester up to the exam. The final exam concentrates on material from the midterm to the end of the course. However, because the foundation for the material covered in the second half of the course is based on the previous material, the final exam should be viewed as being comprehensive with emphasis on material covered during the second half of the semester. Exam questions are based on material from the text, handouts and lectures.

Systems Project

An essential requirement of this course is the systems project. Virtually all analysis and design activities are carried out in project teams, or groups, in which communication and cooperation are vital to success. The group project is intended to give students experience in performing systems development activities as part of a team.

I will be available for consulting with groups at all stages of the project. **Do NOT fall behind!** The project will be divided into milestones. The milestones will be distributed in a separate handout.

Academic dishonesty

Plagiarism, cheating, sharing of examination answers, submitting work done by others as your own, and all other forms of deception proscribed in University rules are forbidden. For the sake of your own dignity and self-esteem, it is better to get a low grade than to engage in dishonesty. (see NYU/Poly Policy for additional details).

<https://engineering.nyu.edu/campus-and-community/student-life/office-student-affairs/community-standards-and-procedures>

Grading: Weights and Scales

Grades

Grades are based on the two exams, class participation, and assignments. **All assignments must be turned in to receive a passing grade.** The weighing given to each of these factors is as follows:

Mid Term Exam	25
Final Exam	25
Quizzes/Assignments	10
Team Project/PSP	25
Participation/Attendance	5
Oral presentation	10

Performance status

During the class lectures, the study material shown in the schedule will be discussed, including the questions at the end of assigned chapters. A portion of the grade will be based on answering these questions

Withdrawal

You must formally withdraw from this course to avoid a failing grade. Failure to attend class or to submit work is not enough. Information about formal withdrawal is contained in the Schedule of Classes. After the last day to withdraw, requests that must be approved by the instructor. They will be approved upon presentation of convincing evidence that unforeseeable conditions beyond the students control prevent him or her from devoting sufficient time to meeting the requirements of the course.

Facilities and Resources

Computers availability & policies

All students are required to have a computer account. The Software Engineering Laboratory is located on the second floor of Rogers Hall.

Course Calendar and Schedule

Week/Lesson	Date	Chapter	I2E/Lean	Assessment (due date)	
				Homework	Project
1/1	9/4	Introduction 1 Why Software Engineering	Mini-Lecture Creativity Approaches		
1 /2	9/6	2 Quality and Metrics	Mini-Lecture The Challenge		
2/1	9/11	3 Software Process	Mini-Lecture Idea Generation	Chapter 1 – 1, 4, 8 I2E – Exercise #1	
2/2	9/13	4 Agile Processes	Mini-Lecture Design – process	Chapter 2 2, 4 I2E –Exercise #2	Project Team Selection Form
3/1	9/18	5 Quality	Mini-Lecture Solutions	Chapter 3 2, 4, 7	
3/2	9/20	6 Configuration Management	Project Discussion	Chapter 4 1, 3, 4	Project Proposal
4/1	9/25	7 Project Management		Chapter 5 2, 4, 7	
4/2	9/27	8 Estimation, Scheduling	Mini-Lecture Requirements Engineering	Chapter 6 2, 3, 4, 5	OKR
5/1	10/2	9 Quality in PM	Business Model canvas	Chapter 7 3, 4, 8	
5/2	10/4	10 Requirements Analysis		Chapter 8 1, 2, 6	RAS Business/Project Definition
6/1	10/9	Legislative Day		Chapter 9 1, 2, 4	
6/2	10/11	11 High Level Analysis		Chapter 10 1, 3, 7	OKR
7/1	10/16	12		Chapter 11	

		Analysis of Detailed Requirements		1, 2, 5, 8	
7/2	10/18	13 Quality Metrics		Chapter 12 1, 3, 5, 7	RAS Requirements
8/1	10/23	Mid Term (Chapters 1-13) Requirements Engineering, Project RAS 6 Best practices		Chapter 13 2, 3, 4	
8/2	10/25	15 Software Design 16 Unified Modeling Language			OKR
9/1	10/31	18 Software Architecture		Chapter 15 2, 3, 5	
9/2	11/1	17 Design patterns		Chapter 16 1, 6, 8	Project Plan
10/1	11/6	19 Detailed Design		Chapter 18 3, 5, 6	
10/2	11/8	20 Design Quality		Chapter 19 1, 4	
11/1	11/13	21 Advanced Methods		Chapter 20 1, 2	
11/2	11/15	22 Implementation			
12/1	11/20	24 Refactoring			RAS – Analysis (Complete)
12/2	11/22	Thanksgiving Recess			
13/1	11/27	25, 26 Software Testing			
13/2	11/29	27, 28 Software Testing			Design
14/1	12/4	Future			
14/2	12/6	Oral Presentations			
15/1	12/11	Oral Presentations			
15/2	12/13	Oral Presentations			
	12/17 – 12/21	Final Examinations			