CS 4513 INET – Software Engineering

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Instructor's name & title

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Teaching Assistants/Graders

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Course Information

Pre-Requisites credits

Co-Requisite: Operating Systems 3.0

Junior or higher majoring in Computer Science, Computer Engineering, or Electrical and Computer Engineering

Class times and location

Tuesdays and Thursdays, 11:00 AM – 12:20 PM, ONLINE

Course Objectives

The goal of this course is to introduce you to software-engineering techniques that can be applied to practical software projects. Upon the successful completion of the course, you should be able to:

- Understand incremental development

- Employ test-driven development

- Understand continuous integration

- Understand the idea of special-purpose languages: *make*, *shell*, *YAML*, *mongosh*

- Interacting with a No SQL database (*mongodb*)

- Use *git* to manage your project's artifacts

- Use a *makefile* to control builds and installs

- Use *GitHub Actions* for CI/CD

- Manage your schedule using a *Kanban board*

- Deploy to the cloud using *Heroku*

- Design an *API*

- Employ *HATEOAS* in an API

- Employ *flask* to implement your API

- Automate your project's documentation

- Coordinate with a front-end that uses your API

General Content

This is the first course in a two-course software engineering design sequence. Focusing on software engineering, the course introduces techniques to specify, evaluate, design, test, and document medium to large scale software systems. This course introduces 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. An introduction to software tools and project management techniques is presented. Student projects involve team software development and tracking, and a formal oral presentation.

Methods of Instruction

The primary method of instruction is actual coding, supplemented with lectures, related assignments, and readings.

Projects

Through an independent project, you will learn to recognize techniques covered in the course, evaluate their usefulness in the real world and compare them to other techniques available. You will also develop your own strategies to solve a practical problem.

- *Project format:* You will be expected to complete an independent team project as part of the course. You will work in a group of 3 - 4 people. You will have to document the project and give a presentation at the end of the term.
- *Project presentation:* The whole class will present their projects in a seminar-like setting (will be advertised) on the last day(s) of the class. Your project will be graded based on the technical validity, written part, and the oral presentation.

Presentation

Each project team is required to deliver 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 or another course such as public speaking). Presentation skills will be graded in the oral presentation skills lecture. Presentation worksheets will be distributed to assist teams in the development of their presentations. All team members are expected to participate in the presentation. Presentation details are (Submission: Presentations are to be posted to the team assignment menu on NYU Classes)

- Type: Formal presentation (video)
- Participation: All team members must participate (10 minutes/member)
- Audience: Instructor (acting as project manager), class
- Format/Media: PowerPoint or other delivery mechanisms (i.e. Web-based)
- Content:

  - ➢ Overview, team member introductions
  - ➢ Project process/management
  - ➢ Requirements (Use Cases, written requirements)
  - ➢ Analysis (Classes, static and dynamic behavior)
  - ➢ PIR (what did we do right? What did we wrong? What would we do differently?)

  - ➢ Conclusions

Textbooks, Readings, materials

Textbook

Dave Farley, "Modern Software Engineering", Addison-Wesley Professional; 1st edition (December 10, 2021)

Optional but highly recommended!

Supplemental Material

Posted at http://www.thedevopscourse.com

Course Policies

(Additional Policies are posted in NYU Tandon Policies and Procedures)

Class 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 gave notice before the exam with an acceptable reason. (See excused absences in the NYU Tandon Policies and Procedures)

Class Participation

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

Exams and Assessments

Examinations

There will be regular quizzes. Questions are based on material from the text, website, and lectures.

System/Software Project

An essential requirement of this course is the systems project. The group project is intended to give students experience in performing systems development activities as part of a team.

Grading and Weighting

Grading Policies

Class participation: Active class participation is very important. Active participation means getting to class prepared, reading the assigned text, doing your homework, and getting involved in discussions. You will be expected to read the material indicated on the course site before coming to class (except for the first day of class).
Homework: Homework will consist entirely of actual commits to your project repo.
Quizzes: Weekly quizzes will be given online.
Final: There will be no final exam – There will be a final project presentation. *Project:* You will be expected to do an independent team (3 – 4 members) project.
Grading: Grades will not be curved against the students, i.e., it will not be harder to get an A than the NYU standard. However, I may curve in your favor, i.e., making it easier to get an A. The final grade will be calculated as follows:
- 5%: class participation
- 40%: quizzes
- 55%: projects

Performance Status

During the class lectures, the study material shown in the schedule is discussed, including the questions at the end of the assigned chapters. There will also be lecture quizzes and knowledge checks given during class. A portion of the grade is 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 the presentation of convincing evidence that unforeseeable conditions beyond the student's control prevent him or her from devoting sufficient time to meeting the requirements of the course.

ABET New Criteria: 1, 2, and 6

NYU and Tandon Policies and Procedures

(Additional Policies are posted on NYU Classes and Tandon website)

Henry and Lucy Moses Center for Students with Disabilities

New York University is committed to providing equal educational opportunity and participation for students with disabilities. We work with NYU students to determine appropriate and reasonable accommodations that support equal access to a world-class education. https://www.nyu.edu/students/communities-and-groups/students-with-disabilities.html

Academic Code of Conduct

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/Tandon Policy for additional details). https://engineering.nyu.edu/campus-and-community/student-life/office-student-affairs/policies/student-code-conduct and https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/university-student-conduct-policy.html

Excused Absence

An absence can be excused if you have missed no more than **10 days of school.** If an illness or special circumstance has caused you to miss more than two weeks of school, please refer to the section labeled Medical Leave of Absence.

Students may request special accommodations for an absence to be excused in the following cases:

- Medical reasons
- Death in immediate family
- Personal qualified emergencies (documentation must be provided)
- Religious Expression or Practice

If illness or an accident causes you to miss a class (or classes) or an exam, you should do the following:

- Notify the Office of Student Affairs by email of your absence, the reason for the absence, how long you think you may be away and supporting documentation.

Medical documentation should state:

- Exact dates of absence
- Estimated of the length of your absence
- Return Date

**If medical documentation does not list the above, your request for excused absence will be considered incomplete, which may delay processing the request. **

Students should not provide anyone except the Office of Student Affairs with a copy of your medical documentation. If a professor requests a copy, refer them to the Office of Student Affairs. This is to protect the confidentiality of your medical information.

It is important for instructors to know when you are experiencing an issue that might interfere with your studies. However, it is also important that your personal matters be kept confidential.

Therefore, the Office of Student Affairs is the office designated to receive documentation regarding private concerns. An official verification notice must be sent to the Office of Student Affairs **within two weeks of the absence**, after that time Student Affairs cannot advocate on your behalf. https://engineering.nyu.edu/campus-and-community/student-life/office-student-affairs/policies#chapter-id-30199

Policy Regarding Observing Religious Holidays

The School of Engineering's policy requires students provide Deanna Rayment, the Coordinator of Student Advocacy, Compliance, and Student Affairs with written notification 14 days in advance of the days to be taken off using the online form.

Tandon Academic Calendar

The Academic Calendar provides all relevant holidays, breaks, commencement, school start/end dates as well as Registration and bursar dates.
https://www.nyu.edu/registrar/calendars/university-academic-calendar.html

Learning Analytics

"Learner engagement, both in class and online, is an important element of this course. I will be looking at our class interactions both in person and digitally in order to tailor the course to best meet your learning needs and make improvements to the course design overall. In person, this means "reading the room" by looking at how students engage with different course materials and activities. Online this means digitally "reading the room" by looking at information about how students engage with different course materials and activities."

University Policies on Sexual Misconduct

Please consult the following link for information on sexual assaults and sexual harassment: http://nyu.edu/titleix

Reporting an Incident of Sexual Assault, Harassment, or Other Sexual Misconduct. Anyone may report an alleged incident to any of the following:
NYU Department of Public Safety (718-260-3537; 212-998-2222)
The Title IX Coordinator (212-998-2352) or via the web at: https://www.nyu.edu/about/policies-guidelines- compliance/equal-opportunity/harassment-and-discrimination/submitcomplaint.html

- A Residence Life and Housing staff member (212-998-4600)

- The Associate Dean of Student Affairs in the Tandon School of Engineering (718- 260-3773)
- The Office of Student Conduct and Community Standards (212-998-4311) • The Student Health Center (212-443-1000)
- The Wellness Exchange (212-443-9999)
- Or another campus official from the contact list