

# CS 4523 B – Design Project

## Spring 2022

### *Instructor's name & title*

Professor Callahan

Department of Computer Science and Engineering

NYU – Tandon School of Engineering

### *e-mail*

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### **Course Information**

### *credits*

3.0

### *Pre-Requisites*

CS-4513 - Software Engineering

### *Class times and location*

Tuesday and Thursday, 11:00 AM – 12:20 PM, Online

### **Course Descriptions**

This is the second course in a two-course design project sequence. This a project coursed in which a student or several students work as a group with a faculty member and/or graduate students on a current topic in computer science. Each term a project course with a particular theme is offered by the Department of Computer and Information Science. A faculty member will assign individual or group projects to students in the class. The project will be highly structured and will be under close supervision of the faculty. It is expected that students will make use of the design and project management skills learned in CS 4513, software engineering. Alternatively, students can work with a faculty member to develop an individualized project of mutual interest. A written design report, project demonstration and 30-minute formal (per team) oral presentation is required. Informal project team presentations will be conducted throughout the semester with the instructor.

## Objectives

Projects are evaluated for quality and completeness: project planning and management (documentation and execution), requirements specification, design and architecture specification, conformance with standards and implementation completeness. Students are encouraged to gain knowledge about how they solve software problems through "best practices", in which they not only perform the work, but are analyzed how it was accomplished. To achieve the goal of the senior project to operate within time, cost and resource constraints the following criteria is used in selecting a project:

- The problem is within the context of a larger development effort. This requires establishment and tracking of project scope and interfacing with the external environment.
- Clients outside the development team are the intended users of the software systems.
- Students have the opportunity to demonstrate individual achievement. Each team member has a unique set of documented roles throughout the project life cycle. These roles are selected and the project organization are developed by the project team and specified in the project plan.
- Students have the opportunity to apply knowledge and skills gained in previous courses.

## Core Competencies

- Opportunity to demonstrate that current software engineering techniques. Students design and implement a computer-based software system covering life cycle phases of requirements engineering, architecture, analysis, design, and implementation.
- Written and oral presentation skills are demonstrated using a series of formal documents and presentations. Students will document their systems to software engineering, the software development life (project proposal, project plans, requirements specification and analysis, design description and implementation),

project demonstration, and formal project presentation (see above). A formal oral project presentation will be conducted at the end of the project.

- Software design techniques include object-oriented design and functional design, as well as the use of Agile and DevOps principles..
- Demonstrate software quality and reliability, software life cycle support processes including testing (verification and validation), software reviews, configuration management, and defect detection and correction strategies

## General Content

This course introduces the software engineering life cycle processes and techniques for the management, development, and documentation of medium and large software systems. Software engineering tools and project management techniques are presented. Student projects involve team software development and tracking.

## Grading

Automated testing/documentation	10%
Two commits per week per student (If you pair program [encouraged] you should do four commits a week per pair, and you must let your TA know who is working together.)	10%
Automated build	10%
CI/CD	10%
Cloud deployment	10%
Code review	15%
Presentation/Demonstration (Capstone competition or VIP may replace the presentation)	30%
Attendance/participation	5%

## Methods of instruction

The primary method of instruction is online sessions, interactive lectures, and project team meetings supplemented with related technology and software engineering materials such as Agile and DevOps practices.

## Class Attendance

Students are expected to attend all lectures and participate in class discussions. For excused absences see the NYU Tandon Policies and Procedures.

Each team is required to have at least one member in attendance for every class to present, or suffer a point reduction.

## Class Participation

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

## Collaboration on Programming Assignments

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

## Project Presentations

The class will conduct "stand ups" almost every class, where each team presents its progress, focused on interesting problems encountered, new technology used, and novel programming techniques.

Each project team is required to deliver a formal in-class, online, or prerecorded presentation describing the technical details of their project focusing on design through implementation life cycle phases and the development process. The presentation delivery, format, and content should be based on material covered in CS 4513 and presentation preparation course (EG at Poly or other courses such as public speaking). Presentation worksheets will be distributed to assist teams in the development of their presentations. Each team member is expected to participate in the presentation. Presentation details are:

- Type: Formal presentation
- Participation: All team members must participate (30 minutes/team)
- Audience: Instructor (acting as project manager), class, faculty, and administration
- Dress: Business (formal or casual)
- Format/Media: PowerPoint or another delivery mechanism (i.e. Web- based)
- Content:
  - Overview, team member introductions
  - Project process/management
  - Requirements review (Use Cases, written requirements)
  - Design (detailed design using UML, final component architecture)
  - Implementation (implementation and deployment architecture, coding, design patterns)
  - Future work - Open Issues/Extensions
  - 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 and all project documentation on CD media.

## 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