



Syllabus
Computer Science EN.601.421/621
Object-Oriented Software Engineering - Online
Fall, 2020 (3 credits)

(The instructor reserves the right to make adjustments to this syllabus as deemed necessary with notice.)

Instructors

Dr. Ali Darvish, Lecturer
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Office hours: to be announced (check the course [Website](#))

Head Teaching Assistant

Shreyas Aiyar (saiyar3@jhu.edu)
Office hours: to be announced (check the course [Website](#))

Meetings

Online meetings on Zoom.
Tuesday and Thursday, 1:30–2:45pm, Zoom (Darvish)

Textbooks

- Recommended:” Head First Object-Oriented Analysis and Design”, by Brett D. McLaughlin, Gary Pollice, Dave West

Online Resources

The course website is jhu-oose.com. Piazza (piazza.com/jhu/fall12020/en601421621) will serve as our communication channel. You should sign up for the course Piazza page immediately. Gradescope (gradescope.com) will be used for homework assignment submission; you will receive an email invitation to this course on Gradescope.

Course Information

- **Description**
This course covers object-oriented software construction methodologies and their application. A major component of the course is a large team project on a topic of your choosing. Course topics covered include object-oriented analysis and design, UML, design principles, refactoring, program testing, code repositories, team programming, and code reviews.

- **Prerequisites**

600/601.226 (Data Structure) and 600.120/601.220 (Intermediate Programming). Students may receive credit for only one of 601.421/621.

Course Goals

By the end of the course students will be able to:

- Explain the client-server model and structure a software system that adheres to this software architecture.
- Write a software requirements specification (SRS) document that describes functional requirements of a medium-size software system.
- Prioritize functional requirements of a software system according to its requirements specifications.
- Recognize software process models and distinguish between plan-driven models (such as waterfall) versus incremental development approaches (such as agile).
- Follow agile software development process (short iteration, continuous delivery, etc.) to build a medium-size software system.
- Describe how version control can be used to help collaborative software development.
- Demonstrate the capability to use software tools (Git/GitHub, Wireframing tools, build tools like Gradle, dependency management tools like NPM, IDEs, ...) in support of the development of a software product of medium size.
- Articulate object-oriented design principles including separation of concerns, information hiding, coupling and cohesion, and encapsulation.
- Use UML class diagrams to express the design of a simple software system and explain how system design principles have been applied in this design.
- Design, implement, document and test web application programming interface (web API) for a simple software system.
- Design and implement data persistence strategies (such as databases, cookies and sessions in web-applications) for medium-size multiuser software application.
- Describe the SOLID design principles and apply them to the design of small software systems.
- Provide examples of creational, structural and behavioral design patterns in Object-Oriented programming paradigm.
- Within the context of object-oriented paradigm, describe one or more design patterns that could be applicable to the design of a simple software system.
- Refactor an existing software implementation to improve some aspect of its design.
- Write a software component that performs some non-trivial task and is resilient to input and run-time errors

Course Expectations & Grading

All students are generally expected to attend all the online sessions of this course and actively participate by answering and asking questions. Participation will not be tracked. The main component of this class is a semester-long group project (5-6 students per group.) Each class meeting session will be either a lecture session or a project meeting session following the schedule given in the course website.

Homework

There are a number of mandatory homeworks. These homeworks are mostly associated with a sample app named MyBooksApp we build in class as a means to get familiarized with a variety of topics. Homeworks should be completed in groups (except homework 1). Each group has a total budget of three late days for the homeworks. At most two late days can be spent on a single homework. We will keep track of the late

days for each group. Each homework assignment will be assigned a point value; the overall homework assignments grade will be computed as your total points earned divided by the total achievable points.

Deadline exceptions can only be made by an instructor (not TAs/CAs), and will only be considered in the circumstances outside the control of the student (e.g., serious illness, death of a relative, etc.). If you must request an exception, do so as early as possible; it is easier to get an exception if you ask before an assignment is due, rather than after. No exceptions will be given for failure to plan ahead or simply having "too much work."

Project

The semester-long project will be done in "iterations" where each iteration lasts for two weeks. Each iteration will be assigned a point value; the overall project grade will be computed as your total points earned divided by the total achievable points. The grading will generally be based on "your plan" for that iteration; your progress is measured against your plan. There are no late days for project iteration deadlines.

Grading Scheme

- 0% - Class participation (expected, but not tracked)
- 20% - Homework
- 20% - Quiz (in class)
- 60% - Project

Letter grades for the course will be subject to the instructor's evaluation of your overall class performance, generally based on this standard scale:

| | |
|------|-----------|
| >90 | A+, A, A- |
| >80 | B+, B, B- |
| >70 | C+, C, C- |
| >=60 | D+, D |
| <60 | F |

The cutoff for assigning +/- to each grade letter is further subject to the instructor's evaluation of your overall class performance. Do not expect a curve in this course.

Ethics

The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition. Report any violations you witness to the instructor. You may consult the associate dean of student affairs and/or the chairman of the Ethics Board beforehand. See the guide on "Academic Ethics for Undergraduates" and the Ethics Board Web site as well as the CS Department's academic integrity code. If you use code/material from online resources (or from people outside of your group-except for Prof/CA) please cite it.

Cheating is immoral. Cheaters that are caught will be punished as is required under University policy. Please report all instances of cheating you see to the professor. Clear-cut cases of cheating will be reported to the Undergraduate Academic Ethics Board, or to the WSE Dean if the student is a graduate student. If a student is found guilty, this information is placed on their permanent academic record and suspension or expulsion may result. If some action seems a grey area to you, please ask first before proceeding!

Project Integrity Policy

Since the course project is open-ended, it is easy to “re-use” knowledge that you may already have, or to re-use other code you may find on the web or obtain through others. Any such instance of re-use is encouraged but must be documented in your submitted documents. Examples include: writing a Java version of a project you did last summer in C++; using an ftp server library you found on github; or, writing a rip-off of an existing PC application. Re-use is fantastic, as long as you explicitly acknowledge your sources. If in doubt about whether an instance of re-use should be documented, e-mail or talk to the professor.

Personal Wellbeing

All students with disabilities who require accommodations for this course should contact me at their earliest convenience to discuss their specific needs. If you have a documented disability, you must be registered with the JHU Office for Student Disability Services (Shaffer 101; 410-516-4720; <http://web.jhu.edu/disabilities/>) to receive accommodations.

If you are struggling with anxiety, stress, depression or other mental health related concerns, please consider visiting the JHU Counseling Center. If you are concerned about a friend, please encourage that person to seek out our services. The Counseling Center is located at 3003 North Charles Street in Suite S-200 and can be reached at 410-516-8278 and online at <http://studentaffairs.jhu.edu/counselingcenter/>

Classroom Climate

I am committed to creating a classroom environment that values the diversity of experiences and perspectives that all students bring. Everyone here has the right to be treated with dignity and respect. I believe fostering an inclusive climate is important because research and my experience show that students who interact with peers who are different from themselves learn new things and experience tangible educational outcomes. Please join me in creating a welcoming and vibrant classroom climate. Note that you should expect to be challenged intellectually by me, the TAs, and your peers, and at times this may feel uncomfortable. Indeed, it can be helpful to be pushed sometimes in order to learn and grow. But at no time in this learning process should someone be singled out or treated unequally on the basis of any seen or unseen part of their identity.

If you ever have concerns in this course about harassment, discrimination, or any unequal treatment, or if you seek accommodations or resources, I invite you to share directly with me or the TAs. I promise that we will take your communication seriously and to seek mutually acceptable resolutions and accommodations. Reporting will never impact your course grade. You may also share concerns with the Department Head (Randal Burns, randal@cs.jhu.edu), the Director of Undergraduate Studies (Joanne Selinski, joanne@cs.jhu.edu), the Assistant Dean for Diversity and Inclusion (Darlene Saporu, dsaporu@jhu.edu), or the Office of Institutional Equity (oiie@jhu.edu). In handling reports, people will protect your privacy as much as possible, but faculty and staff are required to officially report information for some cases (e.g. sexual harassment).