CS 305: Software Engineering

Autumn 2020 (off-campus based session)

Lectures Tuesdays (10:30AM - 11:15AM), Wednesdays(8:30AM - 9:15AM), Fridays(9:30AM - 10:15AM) (only for live, online sessions)

Course web page https://hegden.github.io/cs305/

Piazza discussion page https://piazza.com/iitdh.ac.in/fall2020/cs305/

Instructor Nikhil Hegde (nikhilh@iitdh.ac.in)
Office Hours (doubt clearing sessions) : decided based on individual's / groups' availability online.

Prerequisites A solid grounding in C/C++, Java or some other high level programming language. A working knowledge of data structures.

Textbooks / References

- Video Lectures:
  1. https://omscs.gatech.edu/cs-6300-software-development-process-course-videos
  2. https://nptel.ac.in/courses/106/101/106101061/
  3. https://nptel.ac.in/courses/106/105/106105182/
- Textbooks:
  1. Roger S. Pressman. Software Engineering: A Practioner's Approach (Seventh Edition). McGraw-Hill, 2010.
  2. Timothy C. Lethbridge and Robert Laganiere. Object-Oriented Software Engineering: Practical Software Development using UML and Java (Second Edition). McGraw-Hill, 2005

We will primarily be referring to the video lectures from 1 (Georgia Tech.). Textbook 2 will be consulted as well. Notes posted on the course web page will supplement the video lectures.

Course objective The objective of this course is to enable participants to take a systematic approach towards software development.

Course outcomes A student who successfully fulfills the course requirements will have demonstrated the ability to:

1. Describe and explain various phases in software development life cycle.
2. Describe and explain the terminology and methods in different phases of software development life cycle.
3. Build a software system while moving through all the phases of the software development life cycle.

more specifically, after taking this course, you will be able to:

- Identify methodologies and tools involved in Requirements Analysis, Design, Implementation, Testing, and Deployment phases of software development.
- Explain and use tools to create artifacts related to different phases of SDLC.
  - Explain and use tools for version control, project management, workflow setup and development.

Course assessment The achievement of course objectives will be assessed through a combination of a tests (2, online), assignments (6, online), and a project. The tests will test your understanding of the concepts covered in the class, while the assignments and project will test your ability to put those concepts into practice.

Course grading Grades will be assigned as follows (*this is a tentative grading scheme and the off-campus mode of course content delivery may affect the grading criteria*):

Score	Assessment	Comments
25%	Midsem (12.5%) and Endsem (12.5%)	Open-book, Open-notes, take-home exams.
60%	6 assignments and a mini-project.	Best 5 out of 6 assignments considered. Each assignment contributes equally at 8%. Mini-project carries 20% weightage. Assignments consist of a mix of programming- and techincal paper reading - based.
10%	Short Quizzes	MCQ based questions during in-class sessions. Best 10 would be taken.
5%	Class participation	Bonus, Ask questions on Piazza, Contribute to technical discussions during online sessions

Given your final numerical score, your course grade will be determined according to the following scale:

If your numerical score is at least:	Your course grade will be at least:
90	AA
80	AB
70	BB
60	BC
50	CC
45	CD
40	DD

Assignments and mini-project We will have assignments every 10 days. The assignments may involve exploring different features of a software tool or writing code depending upon the phase of the software development life cycle. It might also involve reading a paper and summarizing. The list of prerequisite software to be installed will be communicated in Piazza (online discussion forum). You are required to install the prerequisite software on your Laptop / Desktop. *in case of non-availability of a system to execute the assignments, an alternate scheme of assessment may be planned on an individual basis.* All assignments, Unless otherwise specified, are due at 11:59 PM on the deadline date.

Assignments will be submitted via GitHub Classroom (https://classroom.github.com). As such, you are required to have a GitHub account. These can be obtained for free at https://github.com. *You must send your GitHub username to the Instructor latest by Wednesday, September 7th, 2020. You must provide the details in a Google Form, the link for which will be posted on Piazza.*

Late submission policy except for medical and family emergencies (accompanied by verification), there will be no individual extensions granted for assignments and project. Late submissions will be scaled according to lateness, docking 10% from your score per day late, up to a maximum of 50%. Submissions more than 5 days late will be assigned a score of 0.

Exams we will have one online exam. The exams are open book, open Internet, and open notes. You may bring the course textbook as well as any written/printed notes/programs from lectures or otherwise.

Exam	Topic	Week (tentative)
Online Exam 1	Overview, Requirements Engineering, Design, Architecture	TBD
Online Exam 2	Implementation, Testing Principles, Continuous Integration / Continuous Development	TBD

Exam topics and tentative dates Note that this is a tentative assessment scheme. The academic office will communicate the exact scheme at a later date. If you need a change in either the test times or environment due to approved accommodation from Dean AP's office, it is your responsibility to contact the Professor two weeks prior to the exam so alternate arrangements can be made.

Course discussion this term we will be using Piazza for class discussion. If you have questions about the course or the project, we encourage you to post them on Piazza. It's a shared discussion forum, where your question can be answered by the instructors, TAs, or your fellow students! Find our class's Piazza page at: https://piazza.com/iitdh.ac.in/autumn2020/cs305/

Students who are active participants on Piazza, asking (or answering!) questions are eligible for class participation / bonus points.

Email Questions about course material or programming assignments should be posted to Piazza or raised during lecture or office hours. *The Professor will not answer programming questions via email.* This is to allow other students who might have similar questions to benefit from our answers. Of course, if you have questions of a personal or confidential nature, we welcome your email.

Course announcements Homework assignment links will be distributed via Piazza announcements and grades will be posted on Moodle. All other course announcements, including changes in due dates, course topics, programming assignment details, etc., will be communicated in three ways:

1. Updates to the course webpage.
2. Announcement posts on Piazza.
3. Email announcements.

Course topics below is the list of topics that will be covered in this course, and a rough estimate of how long we will spend on each.

Topic	Number of weeks	Reading
Introduction to SDLC	1.5	Video Lectures 1 to 44
Tools and Requirements Engineering	1.5	Video Lectures 55 to 109
Design and Architecture	3.5	Video Lectures 110 to 146, 162 to 231, and 332 to 351
Testing	1.5	Video Lectures 232 to 278
Programming Methodology and General Concepts	1	Video Lectures 309 to 320, 326,327
Software Project Management	2.5	Class Notes

Academic honesty unless explicitly allowed, you are expected to complete all assignments by yourself or as a team when teams are allowed. However, you are allowed to discuss general issues with other students (programming techniques, clearing up confusion about requirements, etc.). You may discuss particular algorithmic issues on Piazza (but do not copy code!). *We will be using software designed to catch plagiarism in programming assignments, and all students found sharing solutions will be reported to the Dean of students.*

Punishments for academic dishonesty are severe, including receiving an FR in the course or being expelled from the University. By departmental rules, all instances of cheating will be reported to the Dean. On the

first instance of cheating, students will receive a 0 on the assignment; the second instance of cheating will result in a failure of the course.