



Software Engineering and System Analysis and Design

Course Code: CSE 411
Course Type: Program Core Courses
Session: Fall 2025
Credit Hour: 03
Total Marks: 100

Instructor

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Consultation: By appointment

Rationale of the Course:

The course will initiate students to the different software process models, project management, software requirements and design as a problem solving activity, key elements of analysis and design, and the place of the analysis and design phases within the system development life cycle.

Course Objectives:

- ✓ To have an understanding of different software processes and how to choose them.
- ✓ To know how to elicit requirements from a client and specify them.
- ✓ To design in the large, principled choice of software architecture, the use of modules and interfaces to enable separate development, and design patterns.
- ✓ Understanding good coding practices, including documentation, contracts, regression tests and daily builds.
- ✓ Various quality assurance techniques, including unit testing, functional testing, and automated analysis tools.

Textbooks & Required Reading:

1. Software Engineering: A Practitioner's Approach, Roger S Pressman
2. System Design interview, Volume 2, Alex Xu

Lesson Plan

Week 01	Course Overview, Software Engineering Introduction, SDLC, Classical Waterfall, Iterative Waterfall, V Shaped model, Prototyping
Week 02	Incremental, Evolutionary, Spiral, Agile, SCRUM, MVC Architecture
Week 03	SRS (Software Requirement Specification), Use Case Diagram, Project Proposal Presentation
Week 04	Data Flow Diagram, Project Management, Risk Management , Risk Identification, Risk Assessment , Risk Control
Week 05	Software Testing , Unit Testing, Integration Testing, System Testing White Box Testing, Blackbox Testing, Software Maintenance,
Week 06	Relation of Modern SWE and networking concepts. Course Summarization
Week 07	Monolithic vs Microservice, Proxy vs Reverse Proxy, Single thread vs multi thread, asynchronous communication.
Week 08	Single Server Setup, server scaling and database scaling , caching, relational DBMS and non relational DBMS basics. Database indexing
Week 09	Proximity System Design, Real Time communication, Redis Pub/Sub, Nearby Friends Design
Week 10	Google Maps Design, Message Queue, Youtube video uploading Design.
Week 11	Implementation of system design concepts. Final Presentation
Week 12	Problem Discussion, Course Wrap Up

Marks Distribution

Class Attendance	10
Assignment	10+20
Class Test (Best one of two)	10
Mid Term	25
Final Term	25
Total	100

Grading Policy

Percentage (Marks)	Letter Grades	G.P.A
93% & Above	A	4.0
89% - <93%	A-	3.7
86% - <89%	B+	3.3
82% - <86%	B	3.0
79% - <82%	B-	2.7
75% - <79%	C+	2.3
72% - <75%	C	2.0
69% - <72%	C-	1.7
65% - <69%	D+	1.3
>60%	D	1.0
<60%	F	0.0

Other class information:**Class attendance:**

Class attendance is the easiest way to get 10 marks. The students have to enter into the classroom within 15 minutes of class commencement.

Class tests & term examinations:

The class tests will be taken with prior notification, around one week before. Students will be informed at least before one week in case of term exams. Make-ups for missed exams will only be allowed for a university approved excuse in writing. Any attempt to adopt unfair means will lead to cancellation of the test.

Assignment/Projects:

Assignments/projects/test scripts must be submitted on or before the deadline. Late submission will lead to 25% deduction of marks or in certain cases cancellation of the works.

Scholastic Dishonesty:

Since its' inception EDU has focused on value based education. To maintain academic integrity copying work done by others, either in-class or out of class, is considered as an act of scholastic dishonesty and will be prosecuted to the full extent allowed by University policy. Due to above mentioned reasons the instructor will give a lower grade or fail a student depending upon the severity of the case.