CS253
Introduction and Course Logistics

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Today's Agenda

- Course introduction
- Course logistics
- Course project

Introduction to Software Development

Difference between Computer Program and Software

- A professionally developed software system is often more than a single program
- The system usually consists of
  - A number of separate programs and configuration files that are used to set up these programs
  - System documentation, which describes the structure of the system
  - User documentation, which explains how to use the system
  - Websites for users to download recent product information

Types of Software Product

- Generic product
  - Operating Systems
  - Word Processors
  - Drawing Software
  - Project Management Software
- Customized product
  - Control systems for electronic devices
  - Systems written to support a particular business process

Software Development Activities

- Specification
- Design
- Implementation
- Verification and Validation
- Evolution

Course Logistics

Instructor

Indranil Saha
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Research Interest: Software development for safety-critical systems

Webpage: https://www.cse.iitk.ac.in/users/isaha/

Prerequisite

- ESC 101 (Fundamentals of Computing)
- ESO 207 (Data Structures and Algorithms)

Course Plan

- **Week 0** (January 5)
  Lec 1: Introduction
- **Week 1** (January 8 – January 14)
  Lec 2: Software Process
  Lec 3-4: Requirement Engineering
- **Week 2** (January 15 – January 21)
  Lec 5: Requirement Engineering
  Lec 6-7: Software Architecture
- **Week 3** (January 22 – January 28)
  Lec 8-10: Object Oriented Design
- **Week 4** (January 29 – February 4)
  Lec 14-16: OOP Using C++
- **Week 5** (February 5 – February 11)
  Lec 17-18: OOP Using C++
  Lec 19: Defensive and Secure Programming
- **Week 6** (February 12 – February 18)
  Lec 11-12: Front-End Development
  Lec 13: Database
- February 19–25, 2023
  Mid-Semester Examination
- **Week 7** (February 26 – March 3)
  Lec 20-22: Bash Scripting
- **Week 8** (March 13 – March 19)
  Lec 23: MakeFile and Auto Configuration Tools
  Lec 24-25: Testing
- **Week 9** (March 20 – March 26)
  Lec 26: Testing
  Lec 27: Debugging
  Lec 28: Python Programming
- **Week 10** (March 27 – April 2)
  Lec 29-31: Python Programming
- March 25 – March 31, 2023
  Mid-Semester Recess
- **Week 11** (April 1 – April 7)
  Project Work
- **Week 12** (April 8 – April 14)
  Project Work
- **Week 13** (April 15 – April 21)
  Project Presentations
- April 22 – May 1, 2023
  End-Semester Examination

Course Websites

Course Homepage:
https://www.cse.iitk.ac.in/users/isaha/Courses/sdo24.shtml/

Course Materials, Quizzes, Announcements, and Discussions :
https://hello.iitk.ac.in/

Assignment and Grading:
https://www.gradescope.com/

Grading Policy

- Weekly Quiz - 10%
- Mid-Semester Examination - 15%
- End-Semester Examination - 15%
- Programming Assignment - 10%
- Project - 50%

In-Video Quiz

- Quiz will be conducted over HelloIITK
- A Quiz will contain 3-6 MCQs
- The Deadline for completing the quizzes: Thursday Midnight

Mid-Semester and End-Semester Examinations

- Both examinations will be of MCQ type
- **Syllabus:** All the topics covered before the examination

Programming Assignments

- C++ Programming (Deadline: March 1)
- Shell Scripting (Deadline: March 22)
- Python Programming (Deadline: April 12)

Honesty Policy

- DO NOT Collaborate in the following evaluation components
  - Weekly Quizs
  - Mid-Semester Examination
  - End-Semester Examination
  - Programming Assignment
- NO PLAGIARISM in the Project related documents

Teaching Assistants

- Aakash (Forth Year PhD)
- Shatroopa Saxena (Forth Year PhD)
- Saqib Sarwar (First Year PhD)
- Rahul Aggarwal (Second year MS)
- Somesh Vas Aerupula (Second Year MTech)
- Sumit Kumar Chaudhary (Second Year MTech)
- Vaibhav Tanwar (Second Year MTech)
- Yemike Abhilash Chandra (Second Year MTech)
- Bharat (Second Year MTech)
- Sarthak Neema (Second Year MTech)

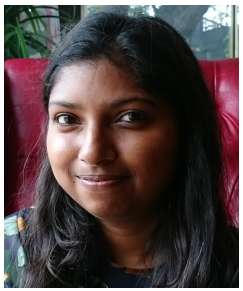
Contributors to Course Lecture

Shatroopa Saxena
(PhD Student)
Two years of experience in IPSoft and Morgan Stanley

Web programming using HTML, CCS, and Javascript

Nikhil Kumar Singh
(PhD Student)
Two years of experience in OptumSoft

Python Programmig



Aishwarya Gupta
(PhD Student)
Two years of experience in Conduent

Python Programmig

Course Project

Project Ideas

- Choose a project with which you can connect
- Developing a software for campus community
  - Hostel mess automation system
  - Health information management system
  - Online direct purchase reimbursement system
  - Sports facility reservation system
  - Online meeting schedule system
- Developing a software with wider applicability
- Try to identify a client for your software

Implementation Platform

- The project has to be developed on a Unix Platform
- Use any programming language, library, or framework

Project Timeline

1. Week 0 (Deadline: January 7, 2023)
   Task: Team registration
2. Week 1 (Deadline: January 12, 2023)
   Task: Project registration
3. Week 2-3 (Deadline: January 26, 2023)
   Task: Requirement generation, analysis, and documentation
   Deliverable: Requirement Document
4. Week 4-5 (Deadlines: February 9, 2023)
   Task: Object-oriented design
   Deliverable: Design Document
5. Week 6-8 (Deadline: March 15, 2023)
   Tasks: Implementation, unit testing, integration testing
   Deliverables: Code in Github Repository, Test Document
6. Week 9-10 (Deadline: March 29, 2023)
   Task: System testing, manual preparation for beta testing
   Deliverables: Code in Github, Test Document, System Manual
7. Week 11-12 (Deadline: April 12, 2023)
   Task: Code improvement, beta testing of some other project, Addressing beta testing feedback
   Deliverable: Beta Test Report
8. Week 13 (Deadline: April 19, 2023)
   Task: Project Presentations
   Deliverables: Final Project Report

Project Evaluation

- Software Implementation
- Project documentation
  - Requirement document
  - Design document
  - Implementation document
  - Test document
  - User manual
  - Beta test document
- Final Presentation
- 360-degree Feedback
  - Beta-testing feedback
  - User feedback
  - Team feedback
  - TA Mentor feedback

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