

Software Engineering

It's a practice of engineering, not just coding.

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Challenge??

- ***Problem:***

- Develop a **University Management System**.
- Budget: **৳ Lac Taka**
- Deadline: **6 Months**

- **Your Task:**

- How will you plan, execute, and deliver the project successfully?
- How will you ensure it's within budget and on time?

What Problem you may face?

- Without proper engineering:
 - Poor planning → **Missed deadlines**
 - Weak design → **System crashes or failures**
 - Lack of communication → **Team conflicts**
 - No quality assurance → **Buggy software**
- With **software engineering**:
 - Structured planning
 - Efficient resource management
 - Reliable, high-quality software

Project Development Planning

- Team Formation
- Working Phase
- Project Management

Team Formation

- **Build a multi-disciplinary team**
 - Requirements Engineer/ System Analyst
 - **Developers**
 - UI/UX Designers
 - SQA Engineer
 - Project Manager
 - Business Analyste (Optional)
- SWOT Analysis of your team

SWOT Analysis of your team

- **SWOT Analysis** is a strategic planning **tool** used to evaluate a team or project by identifying its:
 - **Strengths** (*What your team does best?*): Skills, resources, expertise
 - **Weaknesses** (*Skills gaps or limitations*): Limitations, skill gaps, lack of tools or experience.
 - **Opportunities** (*External factors that help*): Market trends, technologies, or partnerships
 - **Threats** (*Risks or challenges ahead*): External risks like competitors, regulations, or changes in client needs.
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Strengths

Skilled developers
Strong PM experience
Modern tools
Admin Support

Weaknesses

Limited DB Expert
No UI/UX Designer
Poor Team Communication
Weak Security Knowledge

SWOT

Opportunities

High Digital Demand
Govt Portal Integration
Sufficient Budget
Showcase Project

Threats

Competitors
Changing Regulations
Tight Deadlines
Cybersecurity risk

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Task- Team formation for you project

- Form a team for your project with 4/5 members
- Assign their role (Project Manager, Developer etc)
- SWOT Analysis of your team
- **Deliverable:** You have to submit a report on it. No format for this report.

Working Phase (Core Stages)

- **Requirements Engineering** – Understand and document what to build.
- **Design** – Create system architecture and user interfaces.
- **Development (Coding)** – Build the application.
- **Software Quality Assurance (SQA)** – Testing and bug fixing.
- **Deployment** – Release to users.
- **Maintenance** – Ongoing support and updates.

Project Management

- Ensure smooth progress **within time and budget.**
- Assign tasks to team members.
- Use project management tools:
 - Trello / Jira / GitHub
- Track progress regularly:
 - Daily or weekly standups
 - Sprint reviews (if Agile)

What you will learn in this course?

- Understand software development processes deeply.
- Learn to analyse requirements and design solutions.
- Gain hands on experience with tools and techniques.
- Practical experience on developing project.
- Team Collaboration

What is Software Engineering (SE)??

- **Software**

- *Software* is a collection of programs, data, and documentation that perform specific tasks and provide functionality to users or other systems.
- It includes not just the code, but everything required to develop, run, and maintain the system.

- **SE**

- *SE* is the systematic, disciplined, and quantifiable approach to the design, development, testing, deployment, and maintenance of software.
- It combines engineering principles with software development to produce high-quality, reliable, and cost-effective software systems.

Chapter 1: Software and SE (Pressman)

- Defining Software
- Types of Software
- Software Application Domains
- Legacy Software
- SE
- A Layered Technology
- Software Process
- Process Framework: Framework Activities & Umbrella Activities
- SE Practice

Thank you

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