Software Engineering Course Syllabus

1. Introduction to Software Engineering
   - Definition and concepts
   - Software Development Life Cycle (SDLC)
   - Software Process Models (Waterfall, Agile, Spiral)

2. Requirements Engineering
   - Requirements gathering and analysis
   - Functional and non-functional requirements
   - Requirements specification document

3. System Design
   - High-level design and low-level design
   - Design principles and patterns
   - UML diagrams (Use Case, Class, Sequence)

4. Software Construction
   - Coding standards and practices
   - Software development tools and IDEs
   - Version control systems

5. Software Testing
   - Types of testing (Unit, Integration, System, Acceptance)
   - Test-driven development (TDD)
   - Automated testing tools

6. Software Maintenance

- Types of maintenance (Corrective, Adaptive, Perfective)
- Bug tracking and fixing

7. Project Management

- Estimation techniques (COCOMO, Function Point Analysis)
- Risk management in software projects
- Agile and Scrum methodologies