



# C. U. SHAH UNIVERSITY, WADHWAN CITY.

Faculty of: **Computer Science**  
 Course: **Bachelor of Computer Applications**  
 Semester: **IV**  
 Subject Code: **4CS04ASE1 (Elective – II)**  
 Subject Name: **Software Engineering**

Sr. No	Branch Code	Subject Code	Subject Name	Teaching hours/ Week			Credit hours	Credit Points	Evaluation Scheme/ Semester								Total
				Th	Tu	Pr			Theory				Practical				
									Internal Assessment		End Semester Exams		Internal Assessment		End Semester Exams		
									Marks	Duration	Marks	Duration	Marks	Duration	Marks	Duration	
4	2	4CS04ASE1	Software Engineering	4	--	--	4	4	15(SE)	1Hr.	70	2½ Hrs.	--	--	--	--	100
									15(CE)								

**AIM :**

The aim of this subject is to make student how to use software and how to develop software using engineering approach. The students would be able to decide how to design software effectively with help of development models, design, approach in real life applications and familiar with designing different types of diagrams and testing concept.

### COURSE CONTENTS

- Unit I Introduction** **5 Hrs.**
  - Introduction of Software and Software Engineering.
  - Changing nature of software.
  - Software Characteristics
  - Program Vs. Software Products.
  
- Unit II Process Models** **8 Hrs.**
  - Software Engineering – a layered technology
  - The classical waterfall model.
  - RAD Model
  - Prototyping Model
  - Spiral Model
  
- Unit III Analysis Model** **8 Hrs.**
  - Elements of analysis model
  - Object Oriented Analysis
  - Requirement Analysis
  - Data modeling Concept
  - What is component?
  - Different types of cohesion and coupling.
  
- Unit IV Software Testing** **8 Hrs.**

- Software Testing Fundamentals
- Verification and Validation.
- Unit testing
- System testing
- Black box testing
- White box testing
- Control structure testing

#### **Unit V Project Management**

**8 Hrs.**

- Project planning
- Metrics for project size estimation LOC and FP
- COCOMO Model
- Scheduling
  - Work breakdown scheduling
  - Activity network, critical path method.
  - Gantt chart.
- Risk Management
  - Risk identification
  - Risk assessment
  - Risk Containment

#### **Unit VI Quality Management**

**5 Hrs.**

- Introduction of 4P.
- Software Quality Concept.
- Software Quality assurance.
- Software Reliability
- ISO 9000 standards.

#### **Unit VII Object Modeling & Re-Engineering**

**6 Hrs.**

- Overview of OOP Concept.
- UML and UML Diagrams.
- Use case model.
- Class diagram
- Activity diagram.
- Introduction of Software Re-engineering.

#### **REFERENCE BOOKS:**

- Software Engineering – A Practitioner’s Approach, by Roger S. Pressman McGrawHill Publication
- Fundamentals of Software Engineering, by Rajib Mall, PHI Publication
- Software Engineering by Jibitesh Mishra and Ashok Mohanty, Pearson Publication.
- Software Engineering by Bharat Bhushan Agarwal and Sumit prakash tayal, Firewal Media
- UML – A Beginner’s Guide by Jasson Roff, TMH Publication.

#### **NPTEL COURSE (<https://nptel.ac.in/>):**

Software Engineering, IIT Kharagpur. Prof. Rajib Mall

<https://nptel.ac.in/courses/106105182>,

<https://nptel.ac.in/courses/106105087>,