



SECOND-YEAR OF BACHELOR OF COMPUTER SCIENCE SKILL ENHANCEMENT COURSE REVISED SYLLABUS ACCORDING TO CBCS NEP2020

COURSE TITLE: SOFTWARE ENGINEERING
SEMESTER-IV, W.E.F. 2024-2025

**Recommended by the Board of Studies in Computer Science
And**

Approved by the Academic Council

Devrukh Shikshan Prasarak Mandal's

Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and
Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh.
Tal. Sangameshwar, Dist. Ratnagiri-415804, Maharashtra,
India

Academic Council Item No: _____

Name of the Implementing Institute	:	Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangameshwar, Dist. Ratnagiri-415804,
Name of the Parent University	:	University of Mumbai
Name of the Programme	:	Bachelor of Science
Name of the Department	:	Computer Science
Name of the Class	:	Second Year
Semester	:	Four
No. of Credits	:	02
Title of the Course	:	Software Engineering
Course Code	:	S403CST
Name of the Vertical in adherence to NEP 2020	:	Major Minor
Eligibility for Admission	:	Any 12 th Pass seeking Admission to Degree Programme in adherence to Rules and Regulations of the University of Mumbai and Government of Maharashtra
Passing Marks	:	40%
Mode of Assessment	:	Formative and Summative
Level	:	UG
Pattern of Marks Distribution for TE and CIA	:	60:40
Status	:	NEP-CBCS
To be implemented from Academic Year	:	2024-2025
Ordinances /Regulations (if any)		

Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce and Vid. Dadasaheb Pitre Science College, Devrukh (An Autonomous College Affiliated with University of Mumbai)

Syllabus for Second Year of Bachelor of Science in Computer Science

(With effect from the academic year 2024-2025)

SEMESTER-IV

Paper No.– 3

Course Title: Software Engineering

No. of Credits - 02

Type of Vertical: Major Minor

COURSE CODE: S403CST

Learning Outcomes Based on BLOOM's Taxonomy:

After completing the course, the learner will be able to...		
Course Learning Outcome No.	Blooms Taxonomy	Course Learning Outcome
CLO-01	Understand	Understand the techniques for eliciting requirement in a software engineering context
CLO-02	Remember	Remember the different levels of testing in the software development life cycle.
CLO-03	Apply	Apply system/software design principles to solve design problems in specific scenarios.

Syllabus for Second Year of Bachelor of Science in Computer Science

(With effect from the academic year 2024-2025)

SEMESTER-IV

Paper No.– 3

Course Title: Software Engineering

No. of Credits - 02

Type of Vertical: Major And Minor

COURSE CODE: S403CST

COURSE CONTENT			
Module No.	Content	Credits	No. of Lectures
1	<p>Introduction: The Nature of Software, Software Engineering, The Software Process, Generic Process Model, The Waterfall Model, Incremental Process Models, Evolutionary Process Models, Concurrent Models, Component-Based Development, The Unified Process Phases, Agile Development- Agility, Agile Process, Extreme Programming</p> <p>Requirement Analysis and System Modeling: Requirements Engineering, Eliciting Requirements, SRS Validation, Components of SRS, Characteristics of SRS , Object-oriented design using the UML - Class diagram, Object diagram, Use case diagram, Sequence diagram, Collaboration diagram, State chart diagram, Activity diagram, Component diagram, Deployment diagram</p>	01	15
2	<p>System Design: System/Software Design, Architectural Design, Low-Level Design Coupling and Cohesion, Functional-Oriented Versus The Object-Oriented Approach, Design Specifications, Verification for Design, Monitoring and Control for Design</p> <p>Software Quality Assurance: Elements of SQA, SQA Tasks, Goals, and Metrics, Formal Approaches to SQA, Six Sigma, Software Reliability, The ISO 9000 Quality Standards, Capability Maturity Model</p> <p>Software Testing : Verification and Validation, Introduction to Testing, Testing Principles, Testing Objectives, Test Oracles, Levels of Testing, White-Box Testing/Structural Testing, Functional/Black-Box Testing, Test Plan, Test-Case Design</p>	01	15
	Total	02	30

Required Previous Knowledge

Students should know basic concepts related to computer and computer handling

Access to the Course

The course is available for all the students admitted for Bachelor of Science (Computer Science).

Forms of Assessment

The assessment of the course will be of Diagnostic, Formative and Summative type. At the beginning of the course diagnostic assessment will be carried out. The formative assessment will be used for the Continuous Internal Evaluation whereas the summative assessment will be conducted at the end of the term. The weightage for formative and summative assessment will be 60:40. The detailed pattern is as given below.

Semester End Evaluation (60 Marks)
Question Paper Pattern
Time: 2 hours

Question No.	Unit/s	Question Pattern	Marks
Q.1	I & II	MCQ/Fill in the blanks/One line sentence	20
Q.2	I	Descriptive Questions	20
Q.3	II	Descriptive Questions	20
Total			60(converted to 30)

Internal evaluation (20 Marks)

Sr. No.	Description	Marks
1	Classroom Tests	10
2	Project/ Viva/ Presentations/ Assignments	05
3	Attendance	05
Total		20

Grading Scale

10 points grading scale will be used. The grading scale used is O to F. Grade O is the highest passing grade on the grading scale, and grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.

Reference book:

- Software Engineering, A Practitioner's Approach, Roger S, Pressman.(2014)

Text book:

- Techmax publication book

Additional References:

- Software Engineering, Ian Sommerville, Pearson Education
- Software Engineering: Principles and Practices”,Deepak Jain,OXFORD University Press,
- Fundamentals of Software Engineering, Fourth Edition, Rajib Mall, PHI
- Software Engineering: Principles and Practices, Hans Van Vliet, John Wiley & Sons
- A Concise Introduction to Software Engineering, Pankaj Jalote, Springer