BANGALORE UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING, UVCE, BENGALURU
B.Tech. PROGRAMME IN COMPUTER SCIENCE AND ENGINEERING

Course Code	**18CIPC406**					
Category	Engineering Science Courses : Professional Core					
Course title	**SOFTWARE ENGINEERING – THEORY**					
Scheme and Credits	No. of Hours/Week					Semester - IV CSE/ISE
	L	T	P	SS	Credits	
	4	0	0	0	4	
CIE Marks: 50	SEE Marks: 50		Total Max. Marks: 100			Duration of SEE: 03 Hours
Prerequisites (if any): NIL						

COURSE OBJECTIVES:

The course will enable the students to

1. Understand the various professional and ethical issues.
2. Learn the concept of software engineering process.
3. Gain knowledge in the project management.
4. Understand the software design methodology.
5. Analyse the verification process.

UNIT I: INTRODUCTION **09 Hours**

Introduction: FAQ's about software engineering, Professional and ethical responsibility. Socio-Technical systems: Emergent system properties; Systems engineering; Organizations, people and computer systems; Legacy systems.

UNIT II: CRITICAL SYSTEMS, SOFTWARE PROCESSES **09 Hours**

Critical Systems: A simple safety- critical system; System dependability; Availability and reliability. Software Processes: Models, Process iteration, Process activities; The Rational Unified Process; Computer Aided Software Engineering.

UNIT III: REQUIREMENTS **10 Hours**

Software Requirements: Functional and Non-functional requirements; User requirements; System requirements; Interface specification; The software requirements document. Requirements Engineering Processes: Feasibility studies; Requirements elicitation and analysis; Requirements validation; Requirements management. System models, project management System Models: Context models; behavioural models; Data models; Object models; Structured methods. Project Management: Management activities; Project planning; Project scheduling; Risk management.

UNIT IV: SOFTWARE DESIGN **10 Hours**

Architectural Design: Architectural design decisions; System organization; Modular decomposition styles; Control styles. Object-Oriented design: Objects and Object Classes; An Object-Oriented design process; Design evolution.

UNIT V: DEVELOPMENT **10 hours**

Rapid Software Development: Agile methods; Extreme programming; Rapid application development. Software Evolution: Program evolution dynamics; Software maintenance; Evolution processes; Legacy system evolution. Verification and validation Verification and Validation: Planning; Software inspections; Automated static analysis; Verification and formal methods. Software testing: System testing; Component testing; Test case design; Test automation. Management Managing People: Selecting staff; Motivating people; Managing people; The People Capability Maturity Model. Software Cost Estimation: Productivity; Estimation techniques; Algorithmic cost modelling, Project duration and staffing.

TEXT BOOKS:

1. Roger S Pressman "Software Engineering: A Practitioners Approach" Mc Graw Hill Seventh Edition" 2005.
2. Ian Sommerville "Software Engineering" Pearson Education Tenth Edition 2016.

REFERENCE BOOKS:

1. Sungdeok Cha, Richard N Taylor and Book of Software Engneering " Springer Ist Edition 2019.
2. Mohammad Ali Shaik Software Engineering with UML : Designed to Promote Student Learning "Notion Press 1 edition 2018"
3. Rajib Mall, Fundamentals of Software Engineering, "Eastern Economy Edition" Fourth Edition, 2018.

e-BOOKS/ONLINE RESOURCES:

1. https://nptel.ac.in/courses/106105087/pdf/m02L03.pdf

MOOCs:

1. https://www.mooc-list.com/tags/software-engineering

2. https://www.edx.org/learn/software-engineering

COURSE OUTCOMES:

The students at the end of the course, will be able to

CO1: Identify the process, services and delivery models in software engineering.
CO2: Employ the concept of project management.
CO3: Extend the functionalities of resource management and scheduling mechanisms.
CO4: Analyse the design models in software environment.
CO5: Develop management techniques in software.

SCHEME OF EXAMINATION:

<table>
<tr><td rowspan="2">CIE – 50 Marks</td><td>Test I (Any Three Units) - 20 Marks</td><td>Quiz I – 5 Marks</td><td>25 Marks</td><td rowspan="2">Total: 50 Marks</td></tr>
<tr><td>Test II (Remaining Two Units) - 20 Marks</td><td>Quiz II – 5 Marks</td><td>25 Marks</td></tr>
<tr><td rowspan="3">SEE – 100 Marks</td><td colspan="2">Q1 (Compulsory): MCQs or Short answer type questions for 15 Marks covering entire syllabus.</td><td>15 Marks</td><td rowspan="3">Total: 100 Marks</td></tr>
<tr><td colspan="2">Q2 & Q3 from Units which have 09 Hours are compulsory.</td><td>17 * 2 = 34 Marks</td></tr>
<tr><td colspan="2">Q4 or Q5, Q6 or Q7 and Q8 or Q9 from Units which have 10 Hours shall have Internal Choice.</td><td>17 * 3 = 51 Marks</td></tr>
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Note: SEE shall be conducted for 100 Marks and the Marks obtained is scaled down to 50 Marks.

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