Course Code	**18CIPE51A**				
Category	Engineering Science Courses : Professional Elective				
Course title	**SOFTWARE ARCHITECTURE AND TESTING - THEORY**				
Scheme and Credits	No. of Hours/Week				Semester - V CSE/ISE
	L	T	P	SS	Credits	
	2	2	0	0	3	
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

Understand software architectural requirements and drivers.

Be exposed to architectural styles and views.

Be familiar with architectures for emerging technologies.

Apply quality metrics for quality assurance to various softwares.

Analyse methodologies in testing.

UNIT I: INTRODUCTION   09 Hours

Basic Concepts of Software Architecture - Architecture business cycle - architectural patterns - reference models - architectural structures, views; Introduction to Styles - Simple Styles - Distributed and Networked Architectures - Architecture for network based applications - Decentralized Architectures.

UNIT II: DESIGN METHODOLOGIES   09 Hours

Structured Design - Design Practices – Stepwise Refinement – Incremental Design – Structured System-Analysis and Design - Jackson Structured Programming - Jackson System Development.

UNIT III: ARCHITECTURE DESIGN   10 Hours

Typical Architectural Design - Data Flow - Independent Components - Call and Return – Using Styles in Design – choices of styles – Architectural design space – Theory of Design Spaces – Design space of Architectural Elements – Design space of Architectural styles.

UNIT IV: INTRODUCTION TO SOFTWARE QUALITY   10 Hours

Challenges – Objectives – Quality Factors – Components of SQA – Contract Review – Development and Quality Plans – SQA Components in Project Life Cycle – SQA Defect Removal Policies – Reviews. Testing methodologies: Basics of Software Testing – Test Generation from Requirements – Finite State Models – Combinatorial Designs - Test Selection, Minimization and Prioritization for Regression Testing – Test Adequacy, Assessment and Enhancement.

UNIT V: TEST STRATEGIES   10 Hours

Testing Strategies – White Box and Black Box Approach – Integration Testing – System and Acceptance Testing – Performance Testing – Regression Testing - Internationalization Testing – Ad-hoc Testing – Website Testing – Usability Testing – Accessibility Testing.

TEXT BOOKS:

Len Bass, Paul Clements, Rick Kazman, ―Software Architecture in Practice, Third Edition, Addison, Wesley, 2012.
David Budgen, "Software Design", Second Edition, Pearson Education, 2004.
Richard N.Taylor, NenadMedvidovic and Eric M.Dashofy, ―Software Architecture, Foundations, Theory and Practice, Wiley 2010.

REFERENCES:

Daniel Galin, "Software Quality Assurance – from Theory to Implementation", Pearson Education, 2009

Yogesh Singh, "Software Testing", Cambridge University Press, 2012

Aditya Mathur, "Foundations of Software Testing", Pearson Education, 2008

Ron Patton, "Software Testing" , Second Edition, Pearson Education, 2007

e-BOOKS/ONLINE RESOURCES:

https://nptel.ac.in/courses/106104027/

MOOCs:

https://www.mooc-list.com/course/software-architecture-coursera

COURSE OUTCOMES:

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

CO1: Explain different quality metrics for various softwares.

CO2: Illustrate usage of quality metrics to analyse the product Quality.

CO3: Evaluate the test plan and various testing methods.

CO4: Assess software quality standards.

CO5: Develop new quality metrics for software to assure quality.

SCHEME OF EXAMINATION:

CIE – 50 Marks	Test I (Any Three Units) - 20 Marks	Quiz I – 5 Marks	25 Marks	Total: 50 Marks
	Test II (Remaining Two Units) - 20 Marks	Quiz II – 5 Marks	25 Marks	
SEE – 100 Marks	**Q1 (Compulsory):** MCQs or Short answer type questions for 15 Marks covering entire syllabus.		15 Marks	Total: 100 Marks
	Q2 & Q3 from Units which have 09 Hours are compulsory.		17*2= 34 Marks	
	Q4 or Q5, Q6 or Q7 and Q8 or Q9 from Units which have 10 Hours shall have Internal Choice.		17*3= 51 Marks	

Note: SEE shall be conducted for 100 Marks and the Marks obtained is scaled down to 50 Marks.

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