

NIRMA UNIVERSITY

Institute:	Institute of Technology
Name of Programme:	BTech All (Other than CSE)
Course Code:	3CS521IE24
Course Title:	Software Architectures
Course Type:	Interdisciplinary Minor-Elective
Year of Introduction:	2024-25

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Course Learning Outcomes (CLO):

At the end of the course, the students will be able to –

1. illustrate the importance of software architecture and its impact on software development (BL2)
2. analyse and compare different architectural styles and patterns (BL4)
3. evaluate suitable architectural analysis techniques (BL5)
4. perceive architectural decisions effectively to stakeholders. (BL5)

Unit	Contents	Teaching Hours (Total 45)
Unit-I	Introduction to Software Architecture: Software Architecture, Importance of Software Architecture, Role of Software Architect and stakeholders, Architectural patterns, Model-View-Controller, Layered Architecture, Architectural structures and views	08
Unit-II	Architectural Design: Understanding Quality Attributes, achieving qualities, Attribute driven design, Designing for change and maintainability	10
Unit-III	Evaluation and Analysis: Evaluating software architectures, Architecture Trade-off Analysis Method (ATAM), Steps and Phases of ATAM, Software Architecture Analysis Method (SAAM), steps of SAAM evaluation	12
Unit-IV	Software Development Documentation: Principles of sound documentation, refinement, context diagrams, variability, and software interfaces, documenting the behaviour of software elements and software systems	05
Unit-V	Specialized Architectures: Cloud and Distributed Architectures, Mobile and Embedded Architectures, real-time and event-driven architectures, service-oriented architectures, IoT architectures, Emerging trends in Software Architectures	10

Self-Study:

The self-study contents will be declared at the commencement of the semester. Around 10% of the questions will be asked from self-study contents



Suggested Readings/ References:

1. Len Bass, Paul Clements, and Rick Kazman, Software Architecture in Practice, Addison-Wesley
2. Paul Clements, Rick Kazman, and Mark Klein, Evaluating Software Architecture, Addison-Wesley
3. Frank Buschmann, Pattern-Oriented Software Architecture: A System of Patterns, Wiley
4. Mary Shaw and David Garlan, Software Architecture: Perspectives on an Emerging Discipline, Pearson
5. Robert C. Martin, Clean Architecture: A Craftsman's Guide to Software Structure and Design, Pearson

Suggested List of Experiments: -NA-