SOFTWARE ARCHITECTURES

Subject Code	**: 10IS81**	**IA Marks**	**: 25**
Hours/Week	**: 04**	**Exam Hours**	**: 03**
Total Hours	**: 52**	**Exam Marks**	**: 100**

PART – A

UNIT – 1 **6 Hours**

Introduction: The Architecture Business Cycle: Where do architectures come from? Software processes and the architecture business cycle; What makes a “good” architecture? What software architecture is and what it is not; Other points of view; Architectural patterns, reference models and reference architectures; Importance of software architecture; Architectural structures and views.

UNIT – 2 **7 Hours**

Architectural Styles and Case Studies: Architectural styles; Pipes and filters; Data abstraction and object-oriented organization; Event-based, implicit invocation; Layered systems; Repositories; Interpreters; Process control; Other familiar architectures; Heterogeneous architectures. Case Studies: Keyword in Context; Instrumentation software; Mobile robotics; Cruise control; Three vignettes in mixed style.

UNIT – 3 **6 Hours**

Quality: Functionality and architecture; Architecture and quality attributes; System quality attributes; Quality attribute scenarios in practice; Other system quality attributes; Business qualities; Architecture qualities. Achieving Quality: Introducing tactics; Availability tactics; Modifiability tactics; Performance tactics; Security tactics; Testability tactics; Usability tactics; Relationship of tactics to architectural patterns; Architectural patterns and styles.

UNIT – 4 **7 Hours**

Architectural Patterns – 1: Introduction; From mud to structure: Layers, Pipes and Filters, Blackboard.

PART – B

UNIT – 5 **7 Hours**

Architectural Patterns – 2: Distributed Systems: Broker; Interactive Systems: MVC, Presentation-Abstraction-Control.

UNIT – 6 **6 Hours**

Architectural Patterns – 3: Adaptable Systems: Microkernel; Reflection.

UNIT – 7 **6 Hours**

Some Design Patterns: Structural decomposition: Whole – Part; Organization of work: Master – Slave; Access Control: Proxy.

UNIT – 8 **7 Hours**

Designing and Documenting Software Architecture: Architecture in the life cycle; Designing the architecture; Forming the team structure; Creating a skeletal system. Uses of architectural documentation; Views; Choosing the relevant views; Documenting a view; Documentation across views.

Text Books:

1. Len Bass, Paul Clements, Rick Kazman: Software Architecture in Practice, 2nd Edition, Pearson Education, 2003.
   (Chapters 1, 2, 4, 5, 7, 9)
2. Frank Buschmann, Regine Meunier, Hans Rohnert, Peter Sommerlad, Michael Stal: Pattern-Oriented Software Architecture, A System of Patterns, Volume 1, John Wiley and Sons, 2007.
   (Chapters 2, 3.1 to 3.4)
3. Mary Shaw and David Garlan: Software Architecture- Perspectives on an Emerging Discipline, PHI, 2007.
   (Chapters 1.1, 2, 3)

Reference Books:

1. E. Gamma, R. Helm, R. Johnson, J. Vlissides: Design Patterns- Elements of Reusable Object-Oriented Software, Pearson Education, 1995.

Web Reference: http://www.hillside.net/patterns/