

IV YEAR SEM-II B.Tech CSE	ELECTIVE	L	T	P	C
Code: CS4508	Software Architecture and Design Patterns	2	2	0	4

### UNIT I

#### Envisioning Architecture

The Architecture Business Cycle, What is Software Architecture, Architectural patterns, reference models, reference architectures, architectural structures and views

### UNIT II

#### Creating an Architecture

Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture

### UNIT III

#### Analyzing Architectures

Architecture Evaluation, Architecture design decision making, ATAM, CBAM

#### Moving from one system to many

Software Product Lines, Building systems from off the shelf components, Software architecture in future

### UNIT IV

#### Patterns

Pattern Description, Organizing catalogs, role in solving design problems, Selection and usage

#### Creational and Structural patterns

Abstract factory, builder, factory method, prototype, singleton, adapter, bridge, composite, façade, flyweight

### UNIT V

#### Behavioral patterns

Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor

### UNIT VI

#### Case Studies

A-7E – A case study in utilizing architectural structures, The World Wide Web - a case study in interoperability, Air Traffic Control – a case study in designing for high availability, Celsius Tech – a case study in product line development

#### Text Books:

1. Software Architecture in Practice, second edition, Len Bass, Paul Clements & Rick Kazman, Pearson Education, 2003.
2. Design Patterns, Erich Gamma, Pearson Education, 1995.

**Reference Books:**

1. Documenting Software Architectures: Views and Beyond Paul Clements, Felix Bachmann, Len Bass, David Garlen, James Ivers, Reed Little, Robert Nord, Judith Stafford
2. Baldwin, Carliss Y. and Kim B. Clark. *Design Rules, Vol. 1: The Power of Modularity Hardcover*. The MIT Press, March 15, 2000.