SOFTWARE ARCHITECTURE AND DESIGN PATTERNS

Course Code: 13IT2112 **L P C**
4 0 3

Pre requisites: Software Engineering.

Course Outcomes:

At the end of the course, a student will be able to

CO 1: Design Software Architecture.
CO 2: Analyze the Software Architectures.
CO 3: Classify Design Patterns.
CO 4: Describe Behavioral Patterns.
CO 5: Discuss usage of Architectural Structures.

UNIT- I

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

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

UNIT -II

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-III

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, Proxy.

UNIT- IV

Behavioral patterns: Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor.

UNIT -V

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. Len Bass,Paul Clements&Rick Kazman, *Software Architecture in Practice*, 2nd Edition, Pearson Education, 2003.
2. Erich Gamma, *Design Patterns*, 1st Edition, Pearson Education,1995.

References:

1. Luke Hohmann , *Beyond Software architecture*, Addison wesley, 2003.
2. David M. Dikel, David Kane and James R. Wilson, *Software architecture*, 1st Edition, Prentice Hall,2001
3. F.Buschmann , *Pattern Oriented Software Architecture*, Wiley&Sons,1st Edition,2001

Web references :

http://en.wikibooks.org/wiki/Introduction_to_Software_Engineering/Architecture/Design_Patterns.