SOFTWARE ARCHITECTURE AND DESIGN PATTERNS

Course code: 15IT2112

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Pre requisites: Software Engineering.

Course Outcomes:
At the end of the course, a student will be able to
CO1: Design Software Architecture
CO2: Analyze the Software Architectures.
CO3: Classify Design Patterns.
CO4: Describe Behavioral Patterns.
CO5: Discuss usage of Architectural Structures.

UNIT- I (10-Lectures)
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 (10-Lectures)
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 (10-Lectures)
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 (10-Lectures)

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

UNIT –V (10-Lectures)

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:

1. http://en.wikibooks.org/wiki/ Introduction to Software Engineering/Architecture/Design Patterns.