SCHEME OF COURSE WORK

Course Details:

Course Title	**: SOFTWARE ARCHITECTURE AND DESIGN PATTERNS**		
Course Code	**: 15IT2112**	**L T P C**	**: 3 1 0 3**
Program:	**: M.Tech**		
Specialization:	**: Software Engineering**		
Semester	**: II**		
Prerequisites	**: Software Engineering**		
Courses to which it is a prerequisite	**: NIL**		

Course Outcomes (COs):

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

Program Outcomes (POs):

A post graduate of Software Engineering(Information Technology) will be able to

1	Ability to demonstrate in-depth knowledge of Software Engineering with analytical and synthesizing skills
2	Ability to analyze complex problems critically and provide viable solutions
3	Ability to evaluate potential solutions to a problem and arrive at optimal solutions
4	Ability to apply research methodologies and tools and develop innovative techniques for solving complex software engineering problems
5	Ability to apply techniques and tools to solve complex problems
6	Ability to work as a effective team member in a collaborative and multidisciplinary project to achieve common goals
7	Ability to manage a software team and to maintain financial records as per standards
8	Ability to effectively communicate with clients, peers and society at large
9	Ability to take up lifelong learning to be in tune with the fast-changing software related technologies
10	Ability to follow ethical practices in the software industry and accept social responsibility
11	Ability to learn independently from mistakes and surge forward with positive attitude and enthusiasm

Course Outcome Versus **Program Outcomes:**

COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**
CO-1	S	M	S			S					
CO-2	S	M		M		M					
CO-3	S		M	M							
CO-4	S		M	M							
CO-5	S	S	S	M			M	M	M		M

S - Strongly correlated, *M* - *Moderately* correlated, *Blank* - *No correlation*

Assessment Methods:	Seminar / Mid-Test / End Exam

Teaching-Learning and Evaluation

Week	TOPIC / CONTENTS	Course Outcomes	Sample questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	Envisioning Architecture**:** The Architecture Business Cycle, What is Software Architecture, Architectural patterns	CO-1	What is Software Architecture	▫ Lecture	Seminar (Week 6-8)
2	Reference models ,Reference architectures, Architectural structures and views Creating an Architecture: Quality Attributes, Achieving qualities, Architectural styles and patterns	CO-1	Describe the Architectural styles and patterns	▫ Lecture / Discussion	
3	Designing the Architecture ,Documenting software architectures Reconstructing Software Architecture	CO-1	Describe Documenting software architectures	▫ Lecture	
4	Analyzing Architectures: Architecture Evaluation, Architecture design decision making, ATAM, CBAM	CO-1 & CO-2	Analyze the Architectures	▫ Lecture	
5	Moving from one system to many**:** Software Product Lines, Building systems from off the shelf components, Software architecture in future	CO-1 & CO-2	Write about Building systems from off the shelf components	▫ Lecture / Discussion	Mid-Test 1 (Week 9)
6	Software architecture in future, Patterns**:** Pattern Description, Organizing catalogs, Role in solving design problems, Selection and usage	CO-3	How is the Software architecture in future	▫ Lecture	
7	Creational and Structural patterns**:** Abstract factory, Builder	CO-3	What are Creational and Structural patterns	▫ Lecture / Discussion	
8	factory method, Prototype, Singleton	CO-3	Write about singleton	▫ Lecture / Discussion	
9	**Mid-Test 1**				
10	Adapter, Bridge, Composite, Façade, Flyweight	CO-3	What is adapter	▫ Lecture ▫ Discussion	Seminar (Week 14-16)
11	Proxy, Behavioral patterns: Chain of responsibility, Command, Interpreter	CO-4	Describe the design pattern interpreter	▫ Lecture	
12	Iterator, mediator, memento, observer	CO-4	Write about observer design pattern	▫ Lecture / Discussion	
13	State, strategy,template method, visitor	CO-4	Describe the design pattern visitor	▫ Lecture ▫ Discussion	
14	A-7E – A case study in utilizing architectural structures	CO-5	Analyze the case study in utilizing architectural structures	▫ Lecture / Discussion	
15	The World Wide Web - a case study in interoperability	CO-5	Determine a case study in interoperability in the world wide web	▫ Lecture / Discussion	Mid-Test 2 (Week 18)
16	Air Traffic Control – a case study in designing for high availability	CO-5	Describe the patterns in Air Traffic Control	▫ Lecture / Discussion	
17	Celsius Tech – a case study in product line development	CO-5	Discuss about the patterns in Celsius Tech – a case study in product line development	▫ Lecture / Discussion	
18	**Mid-Test 2**				
19/20	**END EXAM**				