DEPARTMENT OF INFORMATION TECHNOLOGY

Software Architecture and Design Patterns

I M.Tech-SE-II Sem

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RESULTS TARGET

TOTAL STRENGTH OF THE CLASS:

S. No	Class / Division	No. of Students
a.	**First Class with Distinction**	
b.	**First Class**	
c.	**Pass Class**	

Method of Evaluation

a.	**Internal Examination**	**2**
b.	**Final Examination**	**1**

Course Objective

- This course helps the students in designing the Architecture of a system.It helps the student in understanding the SDLC of system.It helps the student to get a grasp of the Design patterns and helps how you can apply the design patterns in solving design problems.

JNTU Syllabus

UNIT 1	**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 Architectures.
UNIT-2	**Analyzing Architectures** Architecture Evaluation,Architecture design decision making,ATAM,CBAM
UNIT-3	**Moving from one system to many** Software product lines, Building systems from off the shelf components, Software architecture in future
UNIT-4	**Patterns** Pattern Description, Organizing catalogs,role in solving design problems,Selection and usage. **Creational and Structural Patterns** Abstract Facory,builder,factory method,prototype,singleton,adapter,bridge,composite,facade,flyweight,Proxy
UNIT-5	**Behavioral Patterns** Chain of Responsibility,command,Interpreter,iterator,mediator,memento,observer,state, Strategy,template method, visitor **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- case study in product line development.

GUIDELINES TO STUDENTS

Where will this subject help?

1. This subject will be helpful in designing Architecture and analyzing Design patterns and using the design patterns in solving design problems.

Books / Material

Text Books
1.Software Architecture in Practice,second edition,Len Bass,Paul Clements & Rick Kazman, Pearson Education,1995.(R1) 2.Design Patterns,Erich Gamma,Pearson Education,1995.(R2)

Suggested / Reference Books
1.Beyond Software architecture,Luke Hohmann,Adison Wesley,2003. 2.Software Architecture,David M.Dikel,David Kane and James R.Wilson.,Prentice Hall. 3.Pattern Oriented Software Architecture,F.Buschmann & Others,John Wiley and sons. 4.Head First Design Patterns,Eric Freeman& Elisabeth Freeman,O'REILLY,2007. 5.Design Patterns in C#,Steven John metsker,Pearson education,2004.

COURSE SCHEDULE

NUMBER OF HOURS / LECTURES AVAILABLE IN THIS SEMESTER / YEAR	**65**

Distribution of Hours Unit – Wise

Unit	Topic	Total No. of Hours
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 Architectures.	**13**

II	**Analyzing Architectures** Architecture Evaluation,Architecture design decision making,ATAM,CBAM	**13**
III	**Moving from one system to many** Software product lines, Building systems from off the shelf components, Software architecture in future	**13**
IV	**Patterns** Pattern Description, Organizing catalogs,role in solving design problems,Selection and usage. **Creational and Structural Patterns** Abstract Facory,builder,factory method,prototype,singleton,adapter,bridge,composite,facade,flyweight,Proxy	**13**
V	**Behavioral Patterns** Chain of Responsibility,command,Interpreter,iterator,mediator,memento,observer,state, Strategy,template method, visitor **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- case study in product line development	**13**
	Total	**65**

TOPIC WISE COVERAGE:

UNIT I:

LEARNING OBJECTIVES:
    ❖

LECTURE PLAN: Envisioning Architecture
TOTAL NO_ OF CLASSES: 13

S.No	Name of the Topic	Reference book code	No. of classes required
1	The Architecture Business Cycle,	R1	2
2	What is Software Architecture	R1	2
3	Architectural patterns,	R1	2

4	reference models, reference architectures, architectural structures and views.	R1	2
5	**Creating an Architecture** Quality Attributes, Achieving qualities,	R1	2
6	Documenting software architectures, Reconstructing Software Architectures.	R1	3

ASSIGNMENT-1
1) Describe Architectural Business Cycle?
2) What is Software Architecture?
3) Describe Architectural Patterns?
4) Describe Quality Attributes?
5) Describe documenting software architectures?

UNIT-II :
LEARNING OBJECTIVES:

LECTURE PLAN: Analyzing Architecture

S.No	Name of the Topic	Reference book code	No. of classes required
1	Architecture Evaluation	R1	2
2	Architecture Design Decision Making	R1	3
3	ATAM	R1	4
4	CBAM	R1	4

ASSIGNMENT-II

1)Describe Architectural Evaluation?
2)Describe Architecture Design Decision making?
3)Describe ATAM?
4)Describe CBAM?

UNIT-III
❖ **LEARNING OBJECTIVES:**

LECTURE PLAN: Moving from one system to many

TOTAL NO_ OF CLASSES: 13

S.No	Name of the Topic	Reference book code	No. of classes required
1	Software product lines	R1	5
2	Building systems from Off the shelf Components	R1	4
3	Software architecture in future	R1	4

Assignment III :

1)Describe Software product Lines?

2)Describe building systems from off the shelf components?

3)Describe Software architecture in future?

UNIT-IV :
   ❖ **LEARNING OBJECTIVES:**
LECTURE PLAN:Patterns
TOTAL NO_ OF CLASSES: 13

S.No	Name of the Topic	Reference book code	No. of classes required
1	Pattern Description, Organizing catalogs,role in solving design problems,Selection and usage.	R2	3
2	Creational and Structural Patterns	R2	3
3	Abstract Facory,builder,factory method	R2	3
4	prototype,singleton,adapter,bridge	R2	2
5	composite,facade,flyweight,Proxy	R2	2

Assignment:

1)Describe Organizing catalogs in Design patterns?

2)Describe Abstract Factory?

3)Describe Factory method?

4)Describe adapter?

5)Describe Composite?

UNIT-V:
❖ **LEARNING OBJECTIVES:**

LECTURE PLAN:Behavioral   Patterns
TOTAL NO_ OF CLASSES: 13

S.No	Name of the Topic	Reference book code	No. of classes required
1	Chain of Responsibility,Command, , Template Method,Visitor	R2	4
2	Interpreter,Iterator, Mediator,Memento	R2	3
3	Observer,state,Strategy,	R2	3
4	Template Method,Visitor	R2	3

Assignment

1)Explain Chain of Responsibility?
2)Explain Comand?
3)Explain Iterator?
4)Describe Observer?
5)Describe Visitor?

DEPARTMENT OF INFORMATION TECHNOLOGY
INDIVIDUAL TIME TABLE
NAME OF THE FACULTY*: V.Krishna Reddy

Period	1	2	3	4		5	6	7
Day/Time	9.00-9.50	9.50-10.40	10.40-11.30	11.30-12.20	L U N C H	12.50-1.40	1.40-2.30	2.30-3.20
Mon								
Tue								
Wed								
Thu								
Fri								
Sat								

Software Engineering(SE):
Total no of theory classes   : 05
Total   no of practical classes : 00
Total no of classes   : 05

J. B.Institue of Engineering & Techology
I M.Tech -II SEM (I-MID)
BRANCH: Software Engineering
SUB:Software Architecture and Design Patterns

TIME: 2 hours   **Marks: 40**

Answer any Four of the following: **(4X10=40M)**

1. xxxxxxxxxxxxxx
a) xxxxxxxxxxxx
b) xxxxxxxxxxx

2. xxxxxxxxxxxxxxxxx
     a) xxxxxxxxxxxxxxx
3.xxxxxxxxxxxxxxxxxxxxxx
4.xxxxxxxxxxxxxxx
5.xxxxxxxxxxxxxxx
6.xxxxxxxxxxxxxxxxxx

TIME: 2 hours   **Marks: 40**

Answer any TWO of the following: **(4x10=40M)**

1. xxxxxxxxxxxxxxx
a) xxxxxxxxxxxx
b) xxxxxxxxxxx
c) xxxxxxxxxxxxxxxxxx

2. xxxxxxxxxxxxxxxxx
  a) xxxxxxxxxxxxxxx
  b) xxxxxxxxxxxxxx
  c) xxxxxxxxxxxxx

3. xxxxxxxxxxxxxxxxxxx?

4. xxxxxxxxxxxxxxxs? xxxxx?
5.xxxxxxxxxxxxxx
6.xxxxxxxxxxxxxxxxxx

Marks for Internal Theory Examination

ROLL.NO	NAME OF THE STUDENT	I MID	II MID	Average