Computer Science Paper I Software Architecture and Design Patterns [Compulsory Core Course]

Semester III	Credits:4	Subject Code: MS32001	Lectures: 48
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Course Outcomes:

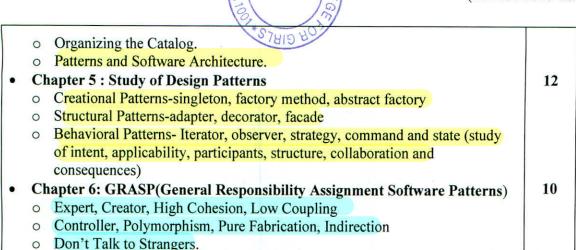
At the end of this course, the learner will be able to:

- Learn how to add functionality to designs while minimizing complexity.
- Interpret the code qualities required to maintain code flexible
- Analyze the common design patterns
- Explore the appropriate patterns for design problems

Unit	1: Introduction to Software Architecture	12
• 0	Chapter 1: Applying UML	2
0	The second of th	-
0	Process Unified Process / Rational Unified Process inception, elaboration, construction, transition	
0	How various components fit in the life cycle The artifacts at end of each	
	process / discipline	
• C	hapter 2 : Software Architecture	4
0	What Software Architecture is and what it isn't?	
0	Why is architecture important?	Į.
0	Architectural structures and views	
0	Introduction to SOLID design principles	
• C	hapter 3 : Architectural Styles:	6
0	Architectural Styles	
0	Pipes and Filters	
0	Data Abstraction and Object – Oriented Organization	
0	and the second s	
0	Layered Systems Repositories	
0		
0	Other familiar Architectures	
0	Heterogeneous Architectures.	

Unit 2: Design Patterns and GRASP		26	
•	Ch	napter 4 : Introduction to Patterns	04
	0	What is a Pattern & Design Pattern?	a T
	0	What makes a Pattern? (GOF)	
	0	Describing Design Patterns.	
	0	Pattern Categories & Relationships between Patterns.	

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nit 3	: Frameworks	14
Cl	napter 7 : Study of Frameworks:	
0	Frameworks as reusable chunks of architecture	
0	The framework lifecycle, development using frameworks	
0	Spring Core Framework	
0	Spring Boot Framework	
0	Microservices with Spring	
0	Web Architectures: Google Web Tool Kit, Spring, Hibernate etc.	
0	Selection of proper framework	
0	Comparing Frameworks	
0	Advantages of Spring	
0	Web based Case Study	

Ur	nit 4	: Case Study	8
	Cl 0 0	Take a Framework and find Patterns in the Frame work. Benefits of Patterns in the chosen Framework How Pattern interact in the selected Framework.	

Reference Books:

- Craig Larman ,Applying UML and Patterns
- · Douglas Schmidt ,Design patterns in Java , Publisher O'Reilly
- E. Gamma, Richard Helm, Ralph Johnson, John Vlissides (GoF), Design Patterns Elements of Reusable Object-oriented Software
- Frank Buschmann, Regine Meunier, Hans Rohnert, Peter Sommerlad, Michael Stal ,Pattern – Oriented Software Architecture (POSA) Volume 1
- Kathy Sierra, Bert Bates, Elisabeth Robson, Eric Freeman, Head First Design Pattern Publisher: O'Reilly Media, Inc.

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- Len Bass, Paul Clements, Rick Kazman, Software Architecture in Practice.
- Mary shaw and David Garlan, Software Architecture- Perspectives on an emerging discipline
- Ranga Rao Karanam, Mastering Spring 5: An effective guide to build enterprise applications using Java Spring and Spring Boot framework, 2nd Edition by; PACKT publishing
- Rod Johnson, Alef Arendsen, Thomas Risberg, Colin Sampaleanu, Professional Java Development with the Spring Framework 1st Edition by; WROX publication
- Sam Newman, Building Microservices-Designing Fine-Grained Systems Publisher: O'Reilly Media

Websites:

- MicroServices
 - o https://www.youtube.com/playlist?list=PLqq-6Pq4ITTZSKAFG6aCDVDP86Qx4lNas
- Spring Framework
 - o https://youtu.be/GB8k2-Egfv0
- Lecture Series
 - https://www.youtube.com/watch?v=YXISkWq04jk&list=PLqq-6Pq4lTTbx8p2oCgcAQGQyqN8XeA1x&index=4
 - o https://www.tutorialspoint.com/spring/spring_architecture.htm

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