DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE
(AUTONOMOUS)
(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)
Re-Accredited with 'A' Grade By NAAC, Accredited by TCS.
Accredited by NBA (AERO, CSE, IT & MECH)
Re-Accredited by NBA (BME, ECE, EEE)
PERAMBALUR - 621212.

COURSE PLAN

Course Code/Name	U20AI843/ SERVICE ORIENTED ARCHITECTURE			
Year/Section/Department	IV/AI&DS			
Credits Details	L: 3	T: 0	P: 0	C: 3
Total Contact Hours Required	45			

Syllabus:

UNIT I/ FUNDAMENTALS OF SOA	**No. Of Periods: 9**
Introduction - Defining SOA - Evolution of SOA - Service Oriented Enterprise - Comparing SOA to client - server and distributed internet architectures - Basic SOA Architecture - concepts - Key Service characteristics - Technical Benefits - Business Benefits	
UNIT II/ COMBINING SOA AND WEB SERVICES	**No. Of Periods: 9**
Web services – Service descriptions – Messaging with SOAP – Message exchange Patterns Web Service Platform - Service Contract - Service Level Data Model - Service Discovery-Service Level Security - Service Level Interaction Patterns - Atomic and Composite Services - Service Enabling Legacy System - Enterprise Service Bus Pattern	
UNIT III/ MULTI CHANNEL ACCESS AND WEB SERVICES COMPOSITION	**No. Of Periods: 9**
SOA for Multi - Channel Access - Business Benefits - Tiers - Business Process Management - Web Service Composition – BPEL – RESTFUL Services - comparison of BPEL and RESTFUL Services	
UNIT IV/ JAVA WEB SERVICES	**No. Of Periods: 9**
SOA support in J2EE – Java API for XML - based web services(JAX-WS) - Java Architecture for XML binding (JAXB) – Java API for XML Registries(JAXR) - Java API for XML based RPC (JAX-RPC) - Web Services Interoperability - SOA support in .NET – ASP.NET web services – Case Studies - Web Services Enhancements (WSE)	
UNIT V / WEB SERVICES SECURITY AND TRANSACTION	**No. Of Periods: 9**
Meta Data Management-Advanced Messaging- Addressing – Reliable Messaging– PoliciesWS-Policy – Security - WS-Security–Notification and Eventing-Transaction Management	

Objective:

- To gain understanding of the basic principles of service orientation.
- Service oriented analysis techniques, technology underlying the service design.
- To gain advanced concepts such as service composition.
- Orchestration and Choreography, and various WS-* specification standards

Text Books:

T1: Eric Newcomer, Lomow, "Understanding SOA with Web Services", Pearson Education, 2005.
T2: JamesMcGovern, Sameer Tyagi, Michael E Stevens, Sunil Mathew, "Java Web Services Architecture", Elsevier, 2003.

Reference Books:

R1: Thomas Erl, "Service Oriented Architecture", Pearson Education, 2005.
R2: Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services, An Architect's Guide", Pearson Education, 2005.
R3: Dan Woods and Thomas Mattern, "Enterprise SOA Designing IT for Business Innovation" O'REILLY, First Edition, 2006.
R4: Frank Cohen, "FastSOA", Elsevier, 2007.
R5: Jeff Davies, "The Definitive Guide to SOA", Apress, 2007.

Website:

W1: https://www.baeldung.com/jax-ws
W2: https://www.tutorialspoint.com/software_architecture_design/ distributed_ architecture.htm
W3: https://www.coursera.org/courses?query=distributed%20systems
W4: https://www.slideshare.net/slideshow/soa-unit-4-soa-web-services-for-integration-and-multichannel-access/251290732
W5: https://www.tutorialspoint.com/soa/soa_enterprise_service_bus.htm

Online Mode of Study:

W1: https://www.tutorialspoint.com/soa/index.htm
W2: https://www.javatpoint.com/service-oriented-architecture
W3: https://www.geeksforgeeks.org/service-oriented-architecture/
W4: https://www.youtube.com/watch?app=desktop&v=wtcJzVJtX3U&t=485s
W5: https://www.youtube.com/watch?v=9fn4vGEKFs8
W6: https://www.youtube.com/watch?v=PA9RjHI463g
W7: https://www.youtube.com/watch?v=p2cA7xbilYg

Course Plan:

Topic Number	Topic	Reference Detail	Page Number	Mode of teaching	Number of Periods Required	Cumulative Period
UNIT I – FUNDAMENTALS OF SOA						
1	Introduction - Defining SOA	T1,W1	1 – 2	BB	1	1
2	Evolution of SOA	T1,W1	1 – 3	BB	1	2
3	Service Oriented Enterprise	T1	3 – 4	PPT	1	3
4	Comparing SOA to client	T1	5 – 6	BB	1	4
5	Server and distributed internet architectures	T1	7 – 9	BB	1	5
6	Basic SOA Architecture	T1	10 – 18	BB	1	6
7	Concepts	T1	54 – 69	PPT	1	7
8	Key Service characteristics	T1	73 – 85	BB	1	8
9	Technical Benefits - Business Benefits	T1	86 – 100	BB	1	9
Outcome of Unit I **CO1:** Understand XML technologies.						
UNIT II - COMBINING SOA AND WEB SERVICES						
10	Web services – Service descriptions	T1, R1	102 – 105	BB	2	10
11	Messaging with SOAP	T1	106 -107	PPT	2	11
12	Message exchange Patterns Web Service Platform	T1	107 -109	BB	1	12
13	Service Contract Service Level Data Model	T1	109 – 123	BB	1	13
14	Service Discovery Service Level Security	T1, R2	123 – 126	PPT	1	14
15	Service Level Interaction Patterns	T1, W2	126 – 138	BB	1	15
16	Atomic and Composite Services	T1	138 – 140	BB	1	16
17	Service Enabling Legacy System	T1	181 – 188	PPT	1	17
18	Enterprise Service Bus Pattern	T1	195 – 197	BB	1	18

Outcome of Unit II **CO2:** Understand service orientation, benefits of SOA.						
UNIT III - MULTI CHANNEL ACCESS AND WEB SERVICES COMPOSITION						
19	SOA for Multi-Channel Access	T1	203 – 205	BB	1	19
20	Business Benefits	T1	202 – 203	BB	1	20
21	Tiers	T1	206 – 214	PPT	1	21
22	Business Process Management	T1	221 – 232	BB	1	22
23	Web Service Composition	T1, W3	261 – 265	BB	1	23
24	BPEL	T1, R2	248 – 254	PPT	1	24
25	RESTFUL Services	T1	255 – 260	BB	1	25
26	comparison of BPEL and RESTFUL Services	T1	265 – 270	BB	1	26
27	comparison of BPEL and RESTFUL Services	T1	273 – 276	BB	1	27
Outcome of Unit III: **CO3:** Understand web services and WS standards.						
UNIT IV – JAVA WEB SERVICES						
28	SOA support in J2EE – Java API for XML	T1	535 – 539	PPT	1	28
29	based web services(JAX-WS)	T2	540 – 543	BB	1	29
30	Java Architecture for XML binding (JAXB)	T2,R2	545 – 580	BB	1	30
31	Java API for XML Registries(JAXR)	T2	479 – 544	PPT	1	31
32	Java API for XML based RPC (JAX-RPC)	T2	313 – 398	BB	1	32
33	Web Services Interoperability - SOA support in .NET	T1, R2	320 – 345	BB	1	33
34	ASP.NET web services	T1	346 – 350	PPT	1	34
35	Case Studies	T2	351 – 354	BB	1	35
36	Web Services Enhancements (WSE)	T1		BB	1	36
Outcome of Unit IV: **CO4:** Understand the principles and applications of JAXB and JAXR for XML data binding and registry-based data operations in Java.						

UNIT V - WEB SERVICES SECURITY AND TRANSACTION						
37	Meta Data Management	T1, W2	273 – 312	PPT	1	37
38	Advanced Messaging	T1	349 – 381	PPT	1	38
39	Addressing	T1, W1	289 – 297	BB	1	39
40	Reliable Messaging	T1	349 – 376	PPT	1	40
41	Policies - WS–Policy	T1	297 – 305	BB	1	41
42	Security	T1	306 – 308	BB	1	42
43	WS-Security	T1, W2	310 – 320	PPT	1	43
44	Notification and Eventing	T1	378 – 379	PPT	1	44
45	Transaction Management	T1	416 – 420	BB	1	45

Outcome of Unit V:
CO5: Understand web services and WS standards.
CO6: Use web services extensions to develop solutions.

Course Outcome:

At the end of course: Students should be able to do:
CO1: Understand XML technologies.
CO2: Understand service orientation, benefits of SOA.
CO3: Understand web services and WS standards.
CO4: Understand the principles and applications of JAXB and JAXR for XML data binding and registry-based data operations in Java.
CO5: Understand web services and WS standards.
CO6: Use web services extensions to develop solutions.

Course Outcome Vs Program Outcome Mapping:

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	1	1	1	2	3	1	3	2	2	3	3	2	2	3	1
CO2	1	1	2	3	3	2	2	2	2	3	2	2	1	2	1
CO3	1	2	2	2	3	2	2	2	2	2	3	3	2	1	2
CO4	2	1	3	2	2	3	3	3	2	2	2	3	3	3	2
CO5	1	2	2	2	3	2	2	2	2	2	3	3	2	1	1
CO6	1	1	3	3	3	3	1	3	2	3	3	2	3	3	2
AVG	1.16	1.33	2.16	2.33	2.83	2.16	2.16	2.33	2.00	2.50	2.66	2.50	2.16	2.16	1.50

Content beyond Syllabus:

- Micro services Architecture
- Event-Driven SOA
- Service Virtualization
- Web-Oriented Architecture (WOA)
- Evolution of Web Services in .NET Ecosystem
- Advanced RESTful Design Principles

Internal Evaluation Components:

Webportal	Assignment	Components	Topic Number with Topic / Unit Details	Relevance to CO
Webportal 1	--	Assessment – I (60)	Unit I and II	CO1 & CO2
	1	Handwritten (20)	8. Key Service characteristics 5. Server and distributed internet architectures 4. Comparing SOA to client	CO1
	2	Poster Presentation / PPT (20)	11. Messaging with SOAP 13. Service Level Data Model 16. Atomic and Composite Services	CO2
Webportal 2	--	Assessment – II (60)	Unit III and IV	CO3 & CO4
	3	Seminar (20)	19. SOA for Multi-Channel Access 23. Web Service Composition 26. comparison of BPEL and RESTFUL Services	CO3
	4	Case Study Report (20)	30. Java Architecture for XML binding (JAXB) 32. Java API for XML based RPC (JAX-RPC) 36. Web Services Enhancements (WSE)	CO4 & CO5
Webportal 3	--	Model Exam (75)	Unit I to V	CO1 to CO6
	5	MCQ (15)	Unit I to V	CO1 to CO6

	-	**Course Attendance (10)**	--	--

Submission Details:

Phase 1(Before AT 1)		Phase 2 (Before AT 2)		Phase 3 (Model)
Assignment 1	**Assignment 2**	**Assignment 3**	**Assignment 4**	**Assignment 5**

Google Class Code Details: a6i6q645
Class Name: U20IT842 – SERVICE ORIENTED ARCHITECTURE

PLAN OF ASSESSMENT TEST –DISTRIBUTION OF MARKS:

TEST	**CO- MARK WISE DISTRIBUTION**						**BLOOM'S LEVEL MARK WISE DISTRIBUTION**					
AT-1	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**	**BTL1**	**BTL2**	**BTL3**	**BTL4**	**BTL5**	**BTL6**
	23	**37**	**--**	**--**	**--**	**--**	**20**	**27**	**13**	**--**	**--**	**--**
AT-2	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**	**BTL1**	**BTL2**	**BTL3**	**BTL4**	**BTL5**	**BTL6**
	--	**--**	**37**	**23**	**--**	**--**	**20**	**26**	**14**	**--**	**--**	
MODEL	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**	**BTL1**	**BTL2**	**BTL3**	**BTL4**	**BTL5**	**BTL6**

Prepared By **Verified By**

Approved By
Principal