Kadi Sarva Vishwavidyalaya
Faculty of Engineering and Technology
First Year Master of Engineering (Computer Engineering)
In Effect from Academic Year 2017-18

Subject Code: MECE104-N	Subject Title: SERVICE ORIENTED ARCHITECTURE

Teaching scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
03	00	02	05	04	03	70	30	20	30	150

LEARNING OBJECTIVES:

The Objectives of this Course is:
- To understand web services and implementation model for SOA.
- To understand SOA, its principles, components.
- To understand paradigms needed for testing web services.
- To implement different testing techniques on web services.
- To explore different testing strategies on SOA based appl

OUTLINE OF THE COURSE:

Sr. No	Title of the Unit	Minimum Hours
1	Evolution and emergence of Web services	8
2	Introduction to SOAP and WSDL	6
3	Registration and discovery of Web services	7
4	SOA planning, analysis, design and implementation	10
5	Web service security considerations	10
6	Managing SOA environment	7

Total hours (Theory): 4 8

Total hours (Lab): 32

Total hours: 80

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DETAILED SYLLABUS

Sr. No	Topic	Lecture Hours	Weight age(%)
1	**Evolution and Emergence of Web Services** Evolution of distributed computing. Core distributed computing technologies – client/server, CORBA, JAVA RMI, Micro Soft DCOM, MOM, Challenges in Distributed Computing, role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA). Principles of SOA and its components. Brief Over View of XML – XML Document structure, XML namespaces, Defining structure in XML documents, Reuse of XML schemes, Document navigation and transformation.	8	17
2	**Introduction to SOAP and WSDL** SOAP : Simple Object Access Protocol, Inter-application communication and wire protocols, SOAP as a messaging protocol, Structure of a SOAP message, SOAP envelope, Encoding, Service Oriented Architectures, SOA revisited, Service roles in a SOA, Reliable messaging, The enterprise Service Bus, SOA Development Lifecycle, SOAP HTTP binding, SOAP communication model, Error handling in SOAP. Describing Web Services – WSDL introduction, non functional service description, WSDL1.1 Vs WSDL 2.0, WSDL document, WSDL elements, WSDL binding, WSDL tools, WSDL port type, limitations of WSDL.	6	13
3	**Registration and discovery of Web services** The role of service registries, Service discovery, Universal Description, Discovery, and Integration, UDDI Architecture, UDDI Data Model, Interfaces, UDDI Implementation, UDDI with WSDL, UDDI specification, Service Addressing and Notification, Referencing and addressing Web Services, Web Services notification.	7	15
4	**SOA planning, analysis, design and implementation** Stages of the SOA lifecycle, SOA Delivery Strategies, service-oriented analysis, Capture and assess business and IT issues and drivers, determining non-functional requirements, business centric SOA and its benefits, Service modeling, Basic modeling building blocks, service models for legacy application integration and enterprise integration, Enterprise solution assets(ESA). Service-oriented design process, design activities, determine services and tasks based on business process model, designing service integration environment (e.g., ESB, registry), Tools available for appropriate designing, implementing SOA, security implementation, implementation of integration patterns, services enablement, quality assurance.	10	20

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5	**Web service security considerations** Network-level security mechanisms, Application-level security topologies, XML security standards, Semantics and Web Services, The semantic interoperability problem, The role of metadata, Service metadata, Overview of .NET and J2EE, SOA and Web Service Management, Managing Distributed System, Enterprise management Framework, Standard distributed management frameworks, Web service management, Richer schema languages, WS-Metadata Exchange.	10	**20**
6	**Managing SOA environment and Web technologies** Distributing service management and monitoring concepts, operational management challenges, Service level agreement considerations, SOA governance ,QoS compliance in SOA governance, role of ESB in SOA governance, impact of changes to services in the SOA lifecycle, Introduction to Ajax, Ajax Design Basics, JavaScript, Blogs, Wikis, RSS feeds. Distributing service management and monitoring concepts, operational management challenges, Servicelevel agreement considerations, SOA governance (SLA, roles and responsibilities, policies, critical success factors, and metrices), QoS compliance in SOA governance, role of ESB in SOA governance, impact of changes to services in the SOA lifecycle	7	**15**
	Total	**48**	**100**

INSTRUCTIONAL METHOD AND PEDAGOGY: (Continuous Internal Assessment (CIA) Scheme)
- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHPetc.
- One internal exam will be conducted as a part of internal theory evaluation.
- Assignments based on the course content will be given to the students for each unit and will be evaluated at regular interval evaluation.
- Attendance is compulsory and it carries 10 marks in evaluating individual performance.
- The course includes a laboratory session, so that students can implement all the concepts practically.

STUDENTS LEARNING OUTCOMES:
On successful completion of the course, the student will:
- Get clear approach about SOA and its implementation.
- Be able to develop web services and publish web services.

TEXT BOOKS:
1. Web Services & SOA Principles and Technology, Second Edition, Michael P. Papazoglou.
2. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India.
3. Developing Enterprise Web Services, S. Chatterjee, J. Webber, Pearson Education.

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REFERENCE BOOKS:

1. Service-Oriented Architecture: Concepts, Technology, and Design. by Thomas Erl. Prentice Hall/Pearson.
2. Building web Services with Java, 2nd Edition, S. Graham and others, Pearson Education.
3. Java Web Services, D.A. Chappell & T. Jewell, O'Reilly, SPD.
4. McGovern, et al., "Java web Services Architecture", Morgan Kaufmann Publishers, 2005.
5. J2EE Web Services, Richard Monson-Haefel, Pearson Education.
6. XML, Web Services, and the Data Revolution, F.P.Coyle, Pearson Education

List of Experimentations:

Sr. No	Name of Practical
1	Write a program to read XML file and display its content in HTML.
2	Using JAXP-SAX, parse XML file in java.
3	Using JAXP-DOM, parse XML file in java.
4	Create SOAP based web service using RPC style.
5	Create SOAP based web service using document style.
6	Create Restful web service by Jersey implementation.
7	Create Restful web service to upload and download file.
8	Create Restful web service with JSON input.
9	Create Restful web service with XML input.
10	Create web service in Java and create .NET client to consume it.
11	Create web service in .NET and create Java client to consume it.
12	Consume Internet hosted web service in Java program.