

Subject Code: 1ET2030203	Subject Title: SERVICE ORIENTED ARCHITECTURE
Pre-requisite	Basic understanding of web based application and programming

Course Objective:

This course provides Service-Oriented Architecture (SOA) concepts and practical aspects in the development and implementation of web applications and composite business services. The course aims to explore detailed understanding of enterprise architectures & security aspect related to e-business services. It also comprises principles of service-oriented computing with goal & challenges for composition service in SOA. Moreover, course aims to develop the basic concepts of services, to evaluate existing strategies, and to make accessible technologies from other fields that can be adopted for emerging technology. It also discusses the challenges and limitation for e-business on demand.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
2	-	2	4	60	40	30	20	150

Subject Contents				
Sr. No	Topic	Total Hours	Weight (%)	
1	INTRODUCTION TO SOA AND WEB SERVICES: Fundamental of Service Oriented Architecture (SOA), Common characteristics of contemporary SOA, Common misperceptions about SOA, Common tangible benefits of using SOA, Common pitfalls of adopting SOA, Evolution of SOA, SOA lifecycle phases.	3	15	
2	WEB SERVICES AND PRIMITIVE SOA: The Web services framework, Services (as Web services), XML, Service descriptions (with Web Service Definition Language-WSDL), Messaging (with Simple Object Access Protocol-SOAP), Directory Services, Universal Description, Discovery, and Integration (UDDI).	3	15	
3	ENTERPRISE ARCHITECTURES & PRINCIPLES OF SOA : SOA in J2EE, SOA in .NET, Elements of Service-Oriented Architectures, SOA standard stacks, RPC versus Document Orientation, Major Benefits of Service-Oriented Computing, Composing Services, Goal & Challenges for Composition.	5	20	
4	SOA AND WS-* EXTENSIONS: Message exchange patterns, Service activity, Coordination, Atomic transactions, Business activities, Orchestration, Choreography, Addressing, Reliable messaging, Correlation, Policies, Metadata exchange.	4	15	
5	SERVICE ORIENTATION IN ENGG & SECURITY: Building SOC Applications, Elements of SOC Design, Quality of Service, How to Create a Process Model, How to Design Agent-Based Systems, How to Construct Agent-Based Systems. How to Engineer Composed Services, Exception Handling, Service Management, and Security in SOA.	5	20	
6	E-BUSINESS ON DEMAND AND SERVICE-ORIENTED ARCHITECTURE : E-Business on demand, The on demand operating environment, Integration , Automation, Virtualization, Service-oriented architecture for on demand ,On demand technologies, Trends & research track in SOA	4	15	

Review Presentation: The student is expected to spend minimum 2 hours per week (as mentioned in the teaching and evaluation scheme) to refer at least two peer reviewed journal papers related to this domain/subject. The student is expected to identify issues/challenges and emerging trends in the domain/subject. Student is supposed to explore various video lectures (E.g. NPTEL) available in the domain/subject. Student is required to make a review-presentation on the work carried out for the same.

Recommended sites for journal papers are (1) dl.acm.org (2) springer.com (3) sciencedirect.com (4) elsevier.com (5) ieeexplore.ieee.org (6) scholar.google.co.in (7) scopus.com or others of similar repute.

Course Outcome:

At the end of this course, the student will be able to

- understand the fundamental of service oriented architecture (SOA)
- study the Designing, development and testing of services in service oriented architecture
- learn the enterprise architectures as per current industries uses
- learn the fundamental architecture view of Service Oriented Architecture in industries
- learn basic principles of service oriented architecture and apply these concepts to develop a sample web based application
- understand the implementation of web services security in SOA.

List of References:

1. Thomas Erl, "Service Oriented Architecture: Concepts, Technology, and Design", Pearson education.
2. Muninder Singh & Michael Huhns, "Service Oriented Computing", Wiley Publication.
3. Mark Endrei & et el., "Patterns: Service Oriented Architecture and Web Services" IBM Redbook.
4. Michael Rosen & et el., "Applied SOA", Wiley Publication.
5. Mark D Hansen, "SOA using Java Web Services", Prentice Hall Publication.

E-Resource / Web Links:

- www.redbooks.ibm.com
- www.oracle.com/us/products/middleware/soa/resources/index.html
- www.enterprise-architecture.info/EA_Services-Oriented-Enterprise.htm
- msdn.microsoft.com/en-us/library/bb833022.aspx
- www.javatpoint.com/service-oriented-architecture
- www.j2eebrain.com/soa

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

1. To develop a XML base document and display it through browser.
2. To develop simple SOA based service for addition of two numbers using J2EE.
3. To develop student marks sheet detail using .NET
4. To develop web service using REST in J2EE
5. Invoking J2EE SOA service in .NET
6. Invoking .NET SOA service using J2EE.
7. To demonstrate web service security in SOA.
8. Implementation of Orchestration with BPEL to add two numbers.
9. Implementation of a BPEL module and a composite application.
10. To study and demonstrate e-shopping based SOA web services. (Purchase, Payment etc.)