

**Subject Name : Service Oriented Computing**  
**Subject Code : CE 703-1**

**Teaching Scheme (Credits and Hours)**

Teaching scheme				Total Credit	Evaluation Scheme					Total
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
04	00	04	08	6	3	70	30	20	30	150

**Learning Objectives:**

- To gain understanding of the web services architectures and motivation for composition.
- To learn service basic concept of SOAP, WSDL and UDDI.
- To learn technology underlying the service design
- To learn advanced concepts such as service composition, orchestration and Choreography.
- To learn about collaboration, Agents, Multi agents system, Agent communication.

**Outline of the Course:**

Sr. No	Title of the Unit	Minimum Hours
1	Introduction to distributed Computing and Web services architectures and standards.	5
2	Directory services, SOAP, WSDL, UDDI and Integration versus Interoperation.	5
3	Principles of Service-Oriented Architecture	5
4	XML primer, Conceptual modeling, RDF, RDFS and OWL	25
5	Execution Models, Transaction over Composed Services, Business process management, Relevant standards BPEL4WS, WSCI, WS-C.	15
6	Collaboration	5

**Total hours (Theory): 60**

**Total hours (Lab): 60**

**Total hours: 120**

## Detailed Syllabus:

Sr. No	Topic	Lecture Hours	Weight age(%)
1	Brief history of information technology, Challenges for composition, Web Services Architectures and Standards. Computing with services, Visions for web, Semantic web, Peer to Peer Computing, Processes and Protocols. Pragmatic web, Open environments.	5	10
2	Directory services, SOAP, REST WSDL, UDDI	5	10
3	<b>Enterprise architectures and Service Oriented Computing</b> Integration versus interoperation, J2EE, .NET, Model Driven Architecture, Legacy systems. Use cases: Intra-enterprise and Inter-enterprise Interoperation, Application, Configuration, Dynamic Selection, Software Fault Tolerance, Grid, and, Utility Computing, Elements of Service-Oriented Architectures, RPC versus Document, Orientation, Composing Services.	5	10
4	<b>Description: Modeling and representation</b> XML primer, Conceptual modeling, Ontology and knowledge sharing, Relevant standards: RDF, RDFS, and OWL, Differencing and tools, Matchmaking. <b>Engagement:</b> Execution Models: Messaging, CORBA, Peer to peer computing, Jini, Grid Computing, Transactions: ACID Properties, Schedules, Locking, Distributed Transactions, Transactions over Composed Services: Architecture, Properties, Compositional Serializability, Process specification: Processes, Workflows.	25	35
5	<b>Business Process Management:</b> Introduction of Business process Management, Process Specification Language, Relevant standards: BPEL4WS, WSCI, WS-C, ebXML, Relaxed transactions, Exception handling.	15	25
6	<b>Collaboration</b> Describing collaborations, Agents, Multiagent systems, Agent communication, languages, Protocols, Commitments and contracts, Planning, Consistency maintenance, Relevant standards: FIPA, OWL-S, Economic models, Organizational models.	5	10
	<b>Total</b>	<b>60</b>	<b>100</b>

## Instructional Method and Pedagogy:

- 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, OHP etc.
- Attendance is compulsory in lecture and laboratory which carries 10 marks in overall evaluation.

- 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.
- Surprise tests/Quizzes/Seminar/tutorial will be conducted having a share of five marks in the overall internal evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments shall be performed in the laboratory related to course contents.

### **Learning Outcome:**

- After the completion of this course student will be able to Understand primary concepts of SOA
- Know the integration of SOA technological points with Web Services.
- Implement of SOA in development cycle of Web Services.

### **Reference Books:**

1. Sandeep Chatterjee, James Webber, “Developing Enterprise Web Services, An Architect’s Guide”, Pearson Education.
2. Newcomer, Lomow, “Understanding SOA with Web Services”, Pearson Education.
3. Thomas Erl, “Service-Oriented Architecture: Concepts, Technology, and Design”, Pearson Education.
4. Dan Woods and Thomas Mattern, “Enterprise SOA Designing IT for Business Innovation” O’REILLY.

### **List of Experiment:**

1. Prepare the documents of SOA terms: UDDI, SOAP, XQuery, XPath, Web Service (JAX-WS & .net ), WSDL, BPEL, SAML, REST and Apache ANT.
2. Create DTD file for student information and create a valid well-formed XML document to store student information against this DTD file.
3. Using XSL, Display student information in tabular format.
4. Create .XSL file for library book information and also create well formed XML document to store this information against .XSL.
5. Create .XSD file for mobile information and also create well formed XML document to store this information against .XSD.
6. Create web calculator service in .NET and create client to consume this service
7. Write a program to create a web service with the use of .net platform to send mail.