

# GUJARAT TECHNOLOGICAL UNIVERSITY

## B.E. SEMESTER : VIII

### COMPUTER ENGINEERING

Subject Name: **SERVICE ORIENTED COMPUTING**

| Sr. No. | Course Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Total Hrs |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| 1.      | <b>Introduction</b><br>Introduction, Brief history of information technology, Distributed computing in the large, Motivations for composition, 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                                                                                                                       | 04        |
| 2.      | <b>Basic concepts</b><br>Directory services, SOAP, WSDL, UDDI                                                                                                                                                                                                                                                                                                                                                                                                                        | 08        |
| 3.      | <b>Enterprise architectures</b><br>Integration versus interoperation, J2EE, .NET, Model Driven Architecture, Legacy systems.                                                                                                                                                                                                                                                                                                                                                         | 06        |
| 4.      | <b>Principles of Service-Oriented Computing</b><br>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                                                                                                                                                          | 10        |
| 5.      | <b>Description: Modeling and representation</b><br>XML primer, Conceptual modeling, Ontology and knowledge sharing, Relevant standards: RDF, RDFS, and OWL, Differencing and tools, Matchmaking                                                                                                                                                                                                                                                                                      | 10        |
| 6.      | <b>Engagement</b><br>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, Business Process Management, Process Specification Language, Relevant standards: BPEL4WS, WSCI, WS-C, ebXML, Relaxed transactions, Exception handling | 12        |
| 7.      | <b>Collaboration</b><br>Describing collaborations, Agents, Multiagent systems, Agent communication, languages, Protocols, Commitments and contracts, Planning, Consistency maintenance, Relevant standards: FIPA, OWL-S, Economic models, Organizational models                                                                                                                                                                                                                      | 08        |

#### Text Books:

1. Service-Oriented Computing: Semantics, Processes, Agents, Munindar P. Singh and Michael N. Huhns, John Wiley & Sons, Ltd., 2005

#### Reference Books:

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