

<b>ITE3004</b>	<b>Distributed Systems</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>J</b>	<b>C</b>
		<b>3</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>
<b>Pre-requisite</b>	<b>ITE2001</b>	<b>Syllabus version</b>				
		1.0				
<b>Course Objectives:</b>						
<ul style="list-style-type: none"> <li>To explore the characteristics of Distributed systems and understand its features.</li> <li>To impart knowledge about remote communication between processes or applications in heterogeneous environment.</li> <li>To provide an exposure to commercial distributed applications / tools / technologies.</li> </ul>						
<b>Expected Course Outcome:</b>						
1) Demonstrate the knowledge of fundamental elements and concepts related to distributed system technologies.						
2) Analyse the core architectural concepts to meet the challenges in implementing the distributed systems						
3) Develop applications targeted for Internet.						
4) Use and apply important methods in distributed systems to support scalability and fault tolerance.						
5) Provide solutions to reliability, security, scalability and robustness in Internet.						
6) Develop applications targeted for Internet using Cloud for real time applications.						
7) Develop distributed applications / tools / technologies.						
<b>Student Learning Outcomes (SLO):</b> <b>2, 7, 17</b>						
[2]	Having a clear understanding of the subject related concepts and of contemporary issues					
[7]	Having computational thinking					
[17]	Having an ability to use techniques, skills and modern engineering tools necessary for engineering practice					
<b>Module:1</b>	<b>Introduction</b>	<b>7 hours</b>				
Introduction to Distributed Systems – System Models – Networking and Internetworking – Inter process Communications - Case Study: IPC in UNIX						
<b>Module:2</b>	<b>Distributed Objects and File System</b>	<b>7 hours</b>				
Distributed Objects and Remote Invocation – Distributed File Systems -Architecture – Recent Advances						
<b>Module:3</b>	<b>Name Services and Directory Service</b>	<b>7 hours</b>				
Name services – Domain Name Systems – Coordination and Agreement – Time and Global states						

<b>Module:4</b>	<b>Transaction and Concurrency Control- Distributed Transactions</b>	<b>7 hours</b>	
Transaction and Nested Transactions – Concurrency Control – Distributed Transactions			
<b>Module:5</b>	<b>Distributed OS and Shared Memory</b>	<b>5 hours</b>	
Distributed Operating System Support – Distributed Shared Memory- Web Services Overview			
<b>Module:6</b>	<b>Google search Engine</b>	<b>5 hours</b>	
Introduction: The Google Search Engine, crawling, Indexing, Ranking, Anatomy of Search Engine, Google as a cloud provider, Software as a service, Platform as a service. Overall Architecture and Design Philosophy: Physical Model, Overall Infrastructure, Google Infrastructure Underlying communication paradigm: Remote invocation, Supporting RPC, Publish - subscribe.			
<b>Module:7</b>	<b>Google File system</b>	<b>4 hours</b>	
Data Storage and coordination services: The Google file System [GFS], Chubby, BigTable. Distributed Computation services: MapReduce, Sawzall			
<b>Module:8</b>	<b>Contemporary issues</b>	<b>3 hours</b>	
	<b>Total Lecture hours:</b>	<b>45 hours</b>	
<b>Text Book(s)</b>			
1.	Coulouris, J. Dollimore, and T. Kindberg, Distributed Systems:Concepts and Designs, Fifth Edition, Addison Wesley, 2012.		
<b>Reference Books</b>			
1.	Andrew.S.Tanenbaum, Maarten Van Steen, Distributed Systems –Principles and Paradigms, Third Edition, Prentice Hall -2016.		
2.	Mukesh Singhal and N. G. Shivaratri, Advanced Concepts in Operating Systems, Distributed, Database, and Multiprocessor Operating Systems, McGraw Hill paperback edition, 2017.		
3.	Vijay K. Garg, Elements of Distributed Computing, Wiley & Sons, 2014.		
Recommended by Board of Studies		05-03-2016	
Approved by Academic Council		No. 40	Date 18-03-2016