

## Distributed Computing

<b>Course Code</b>	<b>18CS73</b>	<b>Credits</b>	04
<b>Course type</b>	PC	<b>CIE Marks</b>	50 marks
<b>Hours/week: L-T-P</b>	3-2-0	<b>SEE Marks</b>	50 marks
<b>Total Hours</b>	50	<b>SEE Duration</b>	3 Hours for 100 marks

### Course learning objectives

1. To learn Basic Concepts of Distributed Systems
2. To understand File Sharing, Distributed File System implementation
3. To understand the concepts of Cryptanalysis, Access control
4. To learn Basic concepts of Cloud Computing

**Pre-requisites:** Basic Computer Concepts, Operating Systems.

### Unit – I

**10 Hours**

**Characterization of Distributed Systems:** Introduction, Examples of Distributed Systems, Challenges: Heterogeneity, Openness, Security, Scalability, Failure Handling.

**System Model:** Architectural Models, Fundamental models.

**Self-learning topics: Security Models**

### Unit – II

**10 Hours**

**Inter Process Communication:** Introduction, API for Internet Protocols, External Data Representation and Marshalling, Client – Server Communication.

**Distributed Object and RMI:** Introduction, Communication between Distributed Objects, RPC, Events and Notifications.

### Unit – III

**10 Hours**

**Distributed File System:** Introduction, File Service architecture.

**Security in distributed systems:** Introduction, Overview of security techniques: Cryptography, Certificates, Access control. Cryptographic Algo: Symmetric: Ex Substitution algo. , Asymmetric: RSA.

### Unit – IV

**10 Hours**

**Time and Global States:** Introduction, Clocks, events and process status, Synchronizing physical clocks, Logical time and logical clocks, Global states.

**Coordination and Agreement:** Introduction, Distributed mutual exclusion, Elections.

### Unit – V

**10 Hours**

**Introduction to Cloud Computing:** Introduction, Network Centric computing and Network Centric

Content, Peer to Peer Systems, Cloud Computing: An old idea Whose Time has Come, Cloud Computing: Delivery Models and Services, Ethical Issues in Cloud Computing, Cloud Vulnerabilities, Major Challenges Faced by Cloud Computing.

**Self-learning topics: Case Studies:** Amazon Web Studies

### Books

#### Text Books

1. George Coulouris, Jean Dollimore, Tim Kindberg: Distributed Systems Concepts and Design, Pearson Education, Third edition
2. Dan Marinescu : Cloud Computing Theory and Practice, ELSEVIER

#### Reference Books

1. Kai Hwang, Geoffrey C, Fox, Jack J, Dongarra: Distributed and Cloud Computing From Parallel processing to the Internet of Things.
2. Sunita Mahajan, Seema Shah: Distributing Computing, Published by Oxford University press 2010.

### Course Outcome (COs)

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

#### Bloom's Level

- |    |  |    |
|----|--|----|
| 1. | <b>Explain</b> the Shared memory concepts.                           | L2 |
| 2. | <b>Explain</b> the advantages of Distributed File Systems.           | L2 |
| 3. | <b>Analyze</b> mechanisms to manage security in Distributed systems. | L4 |

### Program Outcome of this course (POs)

#### PO No.

- |    |  |   |
|----|--|---|
| 1. | <b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.  | 1 |
| 2. | <b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.   | 2 |
| 3. | <b>Design/Development of solutions:</b> Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. | 3 |

Course delivery methods		Assessment methods	
1.	Lecture	1.	Assignments
2.	PPT	2.	Internal Tests
		3.	Quiz
		4.	Course Activity

**Continuous Internal Evaluation (CIE):**

Components	Addition of two IA tests	Average of two assignments	Quiz/Seminar/Course Project	Total Marks
Maximum Marks: 50	15+15 = 30	10	10	50
<b>➤ Writing two IA tests is compulsory</b> <b>➤ Minimum marks required to qualify for SEE : 20 out of 50</b>				

**Self-Study** topics shall be evaluated during CIE (Assignments and IA tests) and 10% weightage shall be given in SEE question paper.

**Scheme of Semester End Examination (SEE):**

1.	It will be conducted for 100 marks of 3 hours duration. It will be reduced to 50 marks for the calculation of SGPA and CGPA.
2.	<b>Minimum marks required in SEE to pass: 40 out of 100</b>
3.	Question paper contains two questions from each unit each carrying 20 marks. Students have to answer one full question from each unit.