Jaipur Engineering College & Research Centre, Jaipur

Distributed System (6CS5-11)

(2020-2021)

Vision of the Department

To become renowned Centre of excellence in computer science and engineering and make competent engineers & professionals with high ethical values prepared for lifelong learning.

Mission of the Department

M1: To impart outcome based education for emerging technologies in the field of computer science and engineering.

M2: To provide opportunities for interaction between academia and industry.

M3: To provide platform for lifelong learning by accepting the change in technologies

M4: To develop aptitude of fulfilling social responsibilities.

RTU Scheme

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Teaching & Examination Scheme

B.Tech. : Computer Science & Engineering

3rd Year – VI Semester

SN	Category	Course		Contact hrs/week			Marks				Cr
		Code	Title	L	T	P	Exm Hrs	IA	ETE	Total	
THEORY											
1	ESC	6CS3-01	Digital Image Processing	2	0	0	2	20	80	**100**	**2**
2	PCC/ PEC	6CS4-02	Machine Learning	3	0	0	3	30	120	**150**	**3**
3		6CS4-03	Information Security System	2	0	0	2	20	80	**100**	**2**
4		6CS4-04	Computer Architecture and Organization	3	0	0	3	30	120	**150**	**3**
5		6CS4-05	Artificial Intelligence	2	0	0	2	20	80	**100**	**2**
6		6CS4-06	Cloud Computing	3	0	0	3	30	120	**150**	**3**
7		Professional Elective 1 (any one)		2	0	0	2	20	80	**100**	**2**
		6CS5-11	Distributed System								
		6CS5-12	Software Defined Network								
		6CS5-13	Ecommerce and ERP								
		Sub-Total		**17**	**0**	**0**		**170**	**680**	**850**	**17**
PRACTICAL & SESSIONAL											
8	PCC	6CS4-21	Digital Image Processing Lab	0	0	3	2	45	30	**75**	**1.5**
9		6CS4-22	Machine Learning Lab	0	0	3	2	45	30	**75**	**1.5**
10		6CS4-23	Python Lab	0	0	3	2	45	30	**75**	**1.5**
11		6CS4-24	Mobile Application Development Lab	0	0	3	2	45	30	**75**	**1.5**
12	SODECA	6CS8-00	Social Outreach, Discipline &Extra Curricular Activities						25	**25**	**0.5**
		Sub- Total		**0**	**0**	**12**		**180**	**145**	**325**	**6.5**
		TOTAL OF VI SEMESTER		**17**	**0**	**12**		**350**	**825**	**1175**	**23.5**

L: *Lecture,* ***T:*** *Tutorial,* ***P:*** *Practical,* ***Cr:*** *Credits*

ETE: *End Term Exam,* ***IA:*** *Internal Assessment*

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

Syllabus

6CS5-11- Distributed System

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Syllabus

III Year-VI Semester: B.Tech. Computer Science and Engineering

6CS5-11: Distributed System

Credit: 2
2L+0T+0P

Max. Marks: 100(IA:20, ETE:80)
End Term Exam: 2 Hours

SN	Contents	Hours
1	**Introduction:** Objective, scope and outcome of the course.	01
2	**Distributed Systems:** Features of distributed systems, nodes of a distributed system, Distributed computation paradigms, Model of distributed systems, Types of Operating systems: Centralized Operating System, Network Operating Systems, Distributed Operating Systems and Cooperative Autonomous Systems, design issues in distributed operating systems. Systems Concepts and Architectures: Goals, Transparency, Services, Architecture Models, Distributed Computing Environment (DCE). Theoretical issues in distributed systems: Notions of time and state, states and events in a distributed system, time, clocks and event precedence, recording the state of distributed systems.	06
3	**Concurrent Processes and Programming:** Processes and Threads, Graph Models for Process Representation, Client/Server Model, Time Services, Language Mechanisms for Synchronization, Object Model Resource Servers, Characteristics of Concurrent Programming Languages (Language not included).Inter-process Communication and Coordination: Message Passing, Request/Reply and Transaction Communication, Name and Directory services, RPC and RMI case studies	05
4	**Distributed Process Scheduling:** A System Performance Model, Static Process Scheduling with Communication, Dynamic Load Sharing and Balancing, Distributed Process Implementation. Distributed File Systems: Transparencies and Characteristics of DFS, DFS Design and implementation, Transaction Service and Concurrency Control, Data and File Replication. Case studies: Sun network file systems, General Parallel file System and Window's file systems. Andrew and Coda File Systems	06
5	**Distributed Shared Memory:** Non-Uniform Memory Access Architectures, Memory Consistency Models, Multiprocessor Cache Systems, Distributed Shared Memory, Implementation of DSM systems. Models of Distributed Computation: Preliminaries, Causality, Distributed Snapshots, Modelling a Distributed Computation, Failures in a Distributed System, Distributed Mutual Exclusion, Election, Distributed Deadlock handling, Distributed termination detection.	06
6	**Distributed Agreement:** Concept of Faults, failure and recovery, Byzantine Faults, Adversaries, Byzantine Agreement, Impossibility of Consensus and Randomized Distributed Agreement. Replicated Data Management: concepts and issues, Database Techniques, Atomic Multicast, and Update Propagation. CORBA case study: Introduction, Architecture, CORBA RMI, CORBA Services.	05
	Total	28

Office of Dean Academic Affairs

PROGRAM OUTCOMES

1. **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** 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.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project Management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life –long Learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Distributed System (6CS5-11)

[L/T/P - 2/0/0]

Class	:	B. Tech. – 6th semester
External marks	:	80
Internal marks	:	20
Total marks	:	100

Course Outcome (CO):

On completion of this course, students will be able to:

CO1: Understand distributed system concepts and desired properties of such systems
CO2: Understand and analyze the problems and challenges associated with distributed system.
CO3: Apply key distributed system properties and evaluate various distributed systems
CO4: Design and deploy distributed system using various mechanisms

MAPPING OF COURSE OUTCOMES WITH PROGRAM OUTCOMES:

Sem	Subject	Code	L/T/P	CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
VI	Distributed System	6CS5-11	L	1. Understand distributed system concepts and desired properties of such systems	3	3	2	2	1	1	1	1	1	2	1	2
			L	2. Understand and analyze t3e problems and c3allenges associated wit3 distributed system.	3	3	2	3	1	1	1	1	1	2	1	3
			L	3. Apply key distributed system properties and evaluate various distributed systems	3	3	3	2	2	1	1	1	1	2	2	3
			L	4. Design and deploy distributed system using various mec3anisms	3	3	3	2	2	1	1	1	1	2	1	3

Program Educational Objectives

1. To strengthen students with fundamental knowledge, effective computing, problem solving and communication skills enable them to have successful career in Computer Science Engineering.

2. To enable students in acquiring Computer Science Engineering.'s latest tools, technologies and management principles to give them an ability to solve multidisciplinary engineering problems.

3. To impart students with ethical values and commitment towards sustainable development in collaborative mode.
4. To reinforce students with research aptitude and innovative approaches which help them to identify, analyze, formulate and solve real life problems and motivates them for lifelong learning.
5. To empower students with leadership quality and team building skills that prepare them for employment, entrepreneurship and to become competent professionals to serve societies and global needs