RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

FOUR YEAR BACHELOR OF TECHNOLOGY (B. Tech..) DEGREE COURSE

SEMESTER: VI (C.B.C.S.)

BRANCH: COMPUTER SCIENCE AND ENGINEERING

Examination Scheme and Syllabus

Sixth Semester:-

S. N.	Subject	Teaching Scheme			Evaluation Scheme			Credits	Category
		L	T	P	CA	UE	Total		
1	Compiler Design	4	-	-	30	70	100	4	PCC-CS
2	Compiler Design -Lab	-	-	2	25	25	50	1	PCC-CS
3	Elective-II	3	-	-	30	70	100	3	PEC-CS
4	Elective-III	3	-	-	30	70	100	3	PEC-CS
5	Open Elective-I	3	-	-	30	70	100	3	OEC
6	Professional Skills Lab II	-	-	2	25	25	50	1	PCC-CS
7	Hardware Lab	-	-	2	25	25	50	1	ESC
8	Mini Project	-	-	6	50	50	100	3	PROJ-CS
9	Economics of IT Industry	2	-	-	15	35	50	2	HSMC
10	Intellectual Property Rights (AuditCourse)	2	-	-	50	-	-	Audit	PCC
	Total	**17**	**-**	**12**			**700**	**21**	

Elective-II: - 1. Machine Learning 2. Internet of Things 3. Cluster and Cloud Computing

Elective-III: - 1. Data Science 2. Distributed Operating Systems 3. Human Computer Interaction

Open Elective 1:- 1. Linux Fundamentals 2. Android Application Development 3. Blockchain Technologies

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Subject: **Elective 3: Distributed Operating Systems** Subject Code: **BTECH-CSE-603.2T**

Load	Credits	College Assessment Marks	University Evaluation	Total Marks
36 Hrs.	**3**	**30**	**70**	**100**

Aim: A distributed operating system is a software over a collection of independent, networked, communicating and physically separate computational nodes. They handle jobs which are serviced by multiple CPUs. Each individual node holds a specific software subset of the global aggregate operating system.

Prerequisite(s): Distributed Operating systems holds concepts such as threads, processes, mutual exclusion, deadlock. It also works on Computer networking concepts such as Internet, protocols, sockets, network application programming.

Course Objectives:

1	To understand the principles and techniques behind the design of distributed systems, such as locking, concurrency, scheduling, and communication across networks.
2	To get knowledge in distributed architecture, naming, synchronization, consistency and replication, fault tolerance, security, and distributed file systems.

Course Outcomes:

At the end of this course Student will be able to:

1	Learn the principles, architectures, algorithms and programming models used in distributed systems.
2	Understand the core concepts of distributed systems.
3	Design and implement sample distributed systems, using different algorithm.
4	Understand the Distributed File System, Architecture, and Mechanism.
5	Analyze the Distributed Scheduling, Issues in Load Distributing, components of a Load Distributing Algorithm, Load Distributing Algorithms.

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SYLLABUS:

Unit I:
Fundamentals: Introduction, Models and Features, Concept of Distributed Operating system, Issues in Design of a Distributed Operating System. Foundations of Distributed System: Limitations of Distributed Systems.

Unit II:
Broadcast Algorithm, Distributed Mutual Exclusion: Requirement of Mutual Exclusion Non Token Based Algorithms: Lamport's Algorithm, Ricard-Agrawala Maekawa's Algorithm.

Unit III:
Distributed Deadlock Detection: Introduction, Deadlock Handling strategies in Distributed System, Centralized and Distributed Deadlock Detection Algorithms.

Unit IV:
Distributed File system, Architecture, and Mechanism for Building Distributed File System. General Architecture of DSM systems, Algorithm for Implementing DSM, Memory coherence and Coherence Protocols.

Unit V:
Distributed Scheduling, Issues in Load Distributing, Load Distributing Algorithms, Sender-Initiated Algorithm, Receiver-Intiated algorithm, Symmetrically Initiated Algorithm, Adaptive Algorithm.

Text books:
1. Advanced Concepts in Operating Systems, Shivaratri, Tata McGraw Hill, 2001. Mukesh Singhal and Niranjan
2. Distributed Systems - Concepts and Design, Coulouris, Dollimore and Kindberg, 5th Edition, Addison-Wesley, 2012.

Reference books:
1. Distributed Operating System, Andrew S. Tanenbaum, Pearson Education, 2003.

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