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S.No.	Subject Code	Category Code	Subject Name	Maximum Marks Allotted					Total Marks	Contact Hours Per Week			Total Credits
				Theory			Practical						
				End. Sem.	Mid Sem. Exam.	Quiz/ Assignment	End Sem.	Lab Work		L	T	P	
1	IT701M	PCC	Cloud Computing	70	20	10	30	20	150	3	-	2	4
2	IT702M	PCC	Information Retrieval	70	20	10	30	20	150	3	-	2	4
3	IT703M	PCC	Machine Learning	70	20	10	30	20	150	3	-	2	4
4	IT704M	PEC	Professional Elective Course-II	70	20	10	-	-	100	3	1	-	4
5	IT705M	OEC	Open Elective Course-III	70	20	10	-	-	100	3	1	-	4
6	IT706M	MC	Industrial Training Evaluation	-	-	-	60	40	100	-	-	4	2
7	IT707M	DLC	Self-Learning Presentation (SWAYAM/NPTEL/MOOC)	-	-	-	-	-	-	-	-	-	8
			Total	**350**	**100**	**50**	**150**	**100**	**750**	**15**	**2**	**10**	**22**
8	IT708M	MC	NSS/NCC/Swachhata Abhiyan/Rural Outreach	Qualifier									
Additional Course for Honours or Minor Specialization				Permitted to opt for maximum three additional courses in subject code IT707M for the award of Honours (Minor Specialization).									

Note: 01. Departmental BOS will decide list of three/four elective subjects for each PEC and OEC.
02. MOOC/NPTEL subjects shall be taken with permission of HOD/Coordinator
03. Industrial training presentation & viva shall take place in VII Sem. which students have already done in VI Sem.

Professional Elective Course-II		
S.No.	**Subject Code**	**Subject Name**
1	IT704M A	Simulation and Modelling
2	IT704M B	Advanced Computer Arcthitecture
3	IT704M C	Real Time Systems

Open Elective Course-III		
S.No.	**Subject Code**	**Subject Name**
1	IT705M A	Wireless & Mobile Communication
2	IT705M B	Embedded Systems
3	IT705M C	Distributed Systems

PEC: Professional Elective Course (Branch Specific), OEC: Open Elective Course (Interdisciplinary), PCC: Professional Core Course, DLC: Distance Learning Course, MC: Mandatory Course

1 hour lecture (L) = 1 credit	1 hour Tutorial (T) = 1 credit	2 hour Practical (P) = 1 credit

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Subject Code	Subject Title	Maximum Marks allotted						Hours/week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz Assignment	End Sem	Lab Work					
IT701M	Cloud Computing	70	20	10	30	20	150	3	-	2	4

Module I
Cloud Introduction:Cloud Computing Fundamentals . Cloud Computing definition, Types of Cloud, Cloud services: Benefits and challenges of cloud computing, usage scenarios and Appliucations, Business models around Cloud — Major players in Cloud Computing-Issues in Cloud- Eucalyptus Nimbus-Open Nebula, Cloudsim. Challenges in Cloud Computing: Migration, Integration, Proprietary VS Open Sources.

Module II
Cloud Services And File System:BIGDATA : Introduction; Types of Cloud services: Software as a Service- Platform as a Service- Infrastructure as a Service- Database as a Service Monitoring as a Service — Communication as services, Service providers —Google App Engine, Amazon EC2.Introuduction to MapReduce, HDFS, Hadoop Framework.

Module III
Virtualization For Cloud:Need for Virtualization ,pros and cons of Virtualization ,Types of Virtualization-System VM, Process VM, Virtual Machine monitor-Virtual machine properties Interpretation and binary translation, HLL VM-Hypervisors -xen, KVM, VMW are Virtual Box, Hyper-V

Module IV
Collaborating with Cloud :Collaborating on Calendars, Schedules and Task Management- Collaborating on Event Management, Contact Management , project Management — Collaborating on word processing, Databases- Storing and Sharing Files- Collaborating via Web- Based Communication Tools Evaluating Web Mail Services- Collaborating via Social Networks- Collaborating via Blogs and Wikis.

Module V
Security, Standards, And Applications: Security in Clouds: Cloud security challenges- Software as a Service Security, Common Standards: The Open Cloud Consortium- The Distributed management Task Force- Standards for application Developers — Standards for Messaging — Standards for Security, End user access to cloud computing, Mobile Internet devices and the cloud

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Experiment List

1. Study and do the Configuration of CLoudSim. Also execute & check the performance of existing algorithms.

a) Install a Cloud Analyst and Integrate with Eclipse/Netbeans. Monitor the performance of an Existing Algorithms.

b) Modify or propose a new load balancing algorithm compatible with Cloud Analyst.

2. Integrating GoogleApp Engine API's in Eclipse and develop an application in Java/Python on the top of
3. Google Cloud. Make the registration groupwise on Google and register your application by using google application-ID
4. Private cloud configuration (Eucalyptus/OpenNebula)
5. Building an application on cloud
6. Amazon instance (Demo Version) Exploring
7. Utlizing the instance by deploying some application 8. Demonstration of Cloud Monitoring tool
9. Exploring Open Stack.

Course Outcomes:

CO1: To understand the benefits and the challenges of cloud computing.

C02: To understand the types of cloud services.

C03: To outline about the need and types of virtualization.

C04: To discuss collaborating with the cloud.

CO5: To analyze the security challenges and standards for security and application.

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Subject Code	Subject Title	Maximum Marks allotted						Hours/week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz Assignment	End Sem	Lab Work					
IT702M	Information Retrieval	70	20	10	30	20	150	3	-	2	4

Module I
Introduction to Information retrieval - Information retrieval process, Indexing, Information retrieval model, Boolean retrieval model
Dictionary and Postings - Tokenization, Stop words, Stemming, Inverted index, Skip pointers, Phrase queries

Module II
Tolerant Retrieval - Wild card queries, Permuterm index, Bigram index, Spelling correction, Edit distance, Jaccard coefficient, Soundex
Term Weighting and Vector Space Model - Wild card queries, Permuterm index, Bigram index, Spelling correction, Edit distance, Jaccard coefficient, Soundex

Module III
Evaluation - Precision, Recall, F-measure, E-measure, Normalized recall, Evaluation problems Latent Semantic Indexing - Eigen Vectors, Singular value decomposition, Low rank approximation, Problems with Lexical Semantics

Module IV
Query Expansion - Relevance feedback, Rocchio algorithm, Probabilistic relevance feedback, Query Expansion and its types, Query drift
Probabilistic Information Retrieval - Probabilistic relevance feedback, Probability ranking principle, Binary Independence Model, Bayesian network for text retrieval

Module V
XML Indexing and Search - Data vs. Text-centric XML, Text-Centric XML retrieval, Structural terms Content Based Image Retrieval - Introduction to content Based Image retrieval, Challenges in Image retrieval, Image representation, Indexing and retrieving images, Relevance feedback

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Course Outcomes:

CO1: To familiarize with Information Retrieval and dictionary and postings.

C02: To understand Tolerant Retrieval Term Weighting and various models.

C03: To perform various evaluation measures and semantic indexing.

C04: To get exposure to query processing in IR and probabilistic IR introduction.

CO5: To understand XML and content based IR.

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Subject Code	Subject Title	Maximum Marks allotted						Hours/week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz Assignment	End Sem	Lab Work					
IT703M	Machine Learning	70	20	10	30	20	150	3	-	2	4

Module I
Mathematical foundations of machine learning, random variables and probabilities, probability distributions, high-dimensional spaces, overview of machine learning, supervised, semi-supervised, unsupervised learning, inductive and transductive frameworks

Module II
Classification:-lntroduction, Decision Tree, The Tree Induction Algorithm, Split Algorithms Based on Information Theory, Split Algorithm Based on the Gini Index,Overfitting and Pruning, Decision Trees Rules..Cluster Analysis:- Introduction, Desired Features of Cluster Analysis, Types of Cluster Analysis Methods:- Partitional Methods, Hierarchical Methods, Density-Based Methods,. Quality and Validity of Cluster Analysis Methods. Classification algorithms: linear and non-linear algorithms, perceptrons, logistic regression, naive Bayes, decision trees, neural networks, support vector machines, regression algorithms, least squares linear regression, neural networks, relevance vector machines

Module III
kernel methods, dual representations, RBF networks, graphical models, Bayesian networks, Markov random fields, inference, ensemble methods, bagging, boosting, random forests

Module IV
practical aspects in machine learning, data preprocessing, overfitting, accuracy estimation, parameter and model selection.

Module V
special topics, PAC learning, sample selection bias, learning from graph data, learning from sequential data

Reference Books:

- Machine Learning: A Multistrategy Approach by Ryszard Spencer Michalski, Ryszard Stanislaw Michalski, George Tecuci.
- Introduction to Machine Learning by Ethem Alpaydin.

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Experiment List

1. Design implementation and evaluation of algorithms for semi supervised learning

2 Study of perceptron update rules and perceptron conversion.

3 Study kernel regression & linear Regression.

4. Study of Bayesian Network.

5. Design of neural network using classification approach.

6 Study of Decision tree.

7. Study of split algorithm based on the Gini/index.

8. Study of practical aspect of machine learning.

9. Study of PAC learning algorithm.

10. Study of logistic regression.

Course Outcomes:

CO1: To introduce with the mathematical foundation of machine learning.

C02: To understand and outline various machine learning algorithms and their classification.

C03: To give insights of the practical aspects in machine learning, data processing and accuracy establishment.

C04: To discuss about some special topics PAC objects.

C05:To learn from graphical data and sequential data.

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Subject Code	Subject Title	Maximum Marks allotted						Hours/week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz Assignment	End Sem	Lab Work					
IT704M A	Simulation and Modelling	70	20	10			100	3	1		4

Module I

Introduction to Modeling and Simulation: Nature of Simulation, Systems , Models and Simulation, Continuous and Discrete Systems, system modeling, Principles used in modeling, Static and Dynamic physical models, Static and Dynamic Mathematical models, concept of simulation, Components of a simulation study. Introduction to Static and Dynamic System simulation, continuous and discrete time simulation. Advantages, Disadvantages and pitfalls of Simulation.

Module II

PROBABILITY CONCEPTS IN SIMULATION: Stochastic variables, discrete and continuous probability functions, Distributed Random numbers, generation of random numbersUniform and Non Uniform Random numbers, variance reduction techniques-Introduction, Common Random numbers-Rationale, Applicability and Synchronization.

Module III

Introduction to Queuing Theory: Characteristics of queuing system, Poisson's formula, berth - death System, equilibrium of queuing system, Queuing Disciplines, Simulation of single and two server queue. Analysis of WW1 queues. Application of queuing theory in computer system like operating systems, computer networks etc.

Module IV

Discrete-Event Simulation: Components and Organization of a Discrete-Event Simulation Model, Determining the Events and Variables, approaches for time advance. Generation of arrival patterns, Simulation programming tasks, Gathering statistics, Measuring occupancy and Utilization , Recording Distributions and Transit times.

Module V

Introduction to Simulation languages: GPSS: Action times, Succession of events, Choice of paths, Conditional transfers, program control statements. SIMSCRIPT: Organization of SIMSCRIPT Program, Names & Labels, SIMSCRIPT statements.

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References:

1. Gorden G., System simulation, Printice Hall.
2. Law .,Simulation Modeling And Analysis, McGraw Hill • Payer T., Introduction to system simulation, McGraw Hill.
3. Spriet, Computer Aided Modeling and Simulation, W.I.A.
4. Sushil, System Dynamics, Wiley Eastern Ltd.
5. Shannon R.E., System simulation, Prentice Hall.

Course Outcomes:

CO1: To understand the principles used in modeling.

C02: To understand the probability concepts used in simulation.

C03: To give overview of discrete event simulation.

C04: To introduce simulation languages GPSS, SIMSCRIPT.

C05: To discuss queuing theory and its applications in computer system.

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Subject Code	Subject Title	Maximum Marks allotted						Hours/week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz Assignment	End Sem	Lab Work					
IT704M B	Advance Computer Architecture	70	20	10			100	3	1		4

Module I
Evolution of Computer Architecture, System Attributes to performance, Multiprocessor and Multi computers, Data and resource dependencies, Hardware & Software Parallelism, Program Partitioning and scheduling, Grain sizes and latency, Grain packing & Scheduling, Static Multiprocessor scheduling, Program flow Mechanisms, Control flow and Data flow, Demanddriven mechanism, Back plane Bus systems, Bus specification, Arbitration, Transaction and interrupt, IEEE future bus + Standards.

Module II
Cache Memory organization, Cache performance issues, Interleaved Memory organizations, Bandwidth and fault tolerance, Memory allocation Schemes. Linear pipeline processors, asynchronous and synchronous Nudels, Speedup, Efficiency and through put. Non-linear pipeline processors, Reservation and latency analysis, Collision free scheduling. Braches handling and Hazard avoidance, Dynamic instruction scheduling, Arithmetic pipeline design, super scalar and super pipeline design.

Module III
Vector computers, Vector instruction types, Vector access Memory schemes, Multi vector Multi processors, Compound vector processing, Static and dynamic Interconnection networks. Cache coherence, Snoopy bus protocols, Directory protocols, Hardware synchronization mechanisms, Message passing mechanisms, Message routing schemes, Deadlock and Virtual channels, Flow control strategies, Multicast reacting algorithms.

Module IV
Principles of scalable performance, Performance metrics and measures, Parallelism profile in programs, Harmonic mean performance, Efficiency, Utilization and quality, Standard performance measures, Application models of parallel computers. Speedup performance laws, Amdahls law for fixed workload, Memory bounded speedup model, Scalability analysis and approaches, Scalability matrix and goals.

Module V
Introduction to parallel programming and parallel programming models, Parallel languages and compilers, dependence analysis of data arrays, Code optimization and scheduling, Loop parallization and pipelining, Parallel program development and environments, Synchronization, Shared variable program structures.

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References:

- Kai Hwang, Advance Computer Architecture, McGraw Hill.

Books & References

1. Computer Architecture - A Quantitative Approach, 5th edition, John L. Hennessy, David A. Patterson.
2. Computer Systems Design and Architecture, 2nd Edition, Vincent P. Heuring
3. Computer Organization and Architecture, 6th Edition, William Stallings
4. Advanced Computer Architectures - A Design Space Approach, Dezsosima, Terence Fountain, Peter Kacsuk.

Course Outcomes:

CO1: To familiarize with Evolution of Computer Architecture and Program Partitioning.

C02: To understand Cache Memory organization and Linear pipeline processors.

C03: To understand Vector computers.

C04: To get exposure to Principles of scalable performance, metrics and measures. COS:

CO5:To Introduce parallel programming and parallel programming models.

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Subject Code	Subject Title	Maximum Marks allotted						Hours/week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz Assignment	End Sem	Lab Work					
IT704M C	Real Time Systems	70	20	10	-	-	100	3	1	-	4

Module I
Introduction: Introduction to UNIX/LINUX, Overview of Commands, File I/O, (open, create, close, Iseek, read, write), Process Control (fork, vfork, exit, wait, waitpid, exec).

Module Il
Real Time Operating Systems: Brief History of OS, Defining RTOS, The Scheduler, Objects, Services, Characteristics of RTOS, Defining a Task, asks States and Scheduling, Task Operations, Structure, Synchronization, Communication and Concurrency. Defining Semaphores, Operations and Use, Defining Message Queue, States, Content, Storage, Operations and Use.

Module Ill
Objects, Services and I/O: Pipes, Event Registers, Signals, Other Building Blocks, Component Configuration, Basic I/O Concepts, I/O Subsystem.

Module IV
Exceptions, Interrupts and Timers: Exceptions, Interrupts, Applications, Processing of Exceptions and Spurious Interrupts, Real Time Clocks, Programmable Timers, Timer Interrupt Service Routines (ISR), Soft Timers, Operations.

Module V
Case Studies of RTOS: RT Linux, MicroC/OS-II, VxWorks, Embedded Linux, and Tiny OS.

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Textbook

Real Time Conceptsfor Embedded Systems — Qing Li, Elsevier, 2011

Books & References

1. Embedded Systems- Architecture, Programming and Design by Rajkamal, 2007, TMH.
2. Advanced UNIX Programming, Richard Stevens
3. Embedded Linux: Hardware, Software and Interfacing, Dr. Craig Hollabaugh

Course Outcomes:

CO1: To Introduce UNIX/LINUX.

C02: To understand Real Time Operating Systems.

C03: To understand Objects, Services and I/O in RTS.

C04: To understand exceptions, Interrupts and Timers in RTS.

C05: To analyze Case Studies of RTOS

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Subject Code	Subject Title	Maximum Marks allotted						Hours/week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz Assignment	End Sem	Lab Work					
IT705M A	Wireless and Mobile communication	70	20	10	-	-	100	3	1	-	4

Module I
Introduction of Wireless Networks, Different Generations of Wireless Networks.
Characteristics of the Wireless Medium: Radio Propagation Mechanisms, Path Loss Modelling and Signal Coverage, Effect of Multipath and Doppler, Channel Measurement and Modelling Techniques.

Module II
Introduction to cellular mobile system A basic cellular system, performance criteria, Uniquences of Mobile Radio Environment, Operation of cellular systems, Planning and cellular system, Analog and digital cellular systems. Elements of cellular radio system design: General description of the problem, Concept of frequency channels, Co channel interface reduction factor, Cell splitting, Consideration of the components of cellular systems.

Module III
Cell coverage for signal and traffic: General introduction, obtaining the mobile point-to-point mode propagation over water or flat open area, foliage loss, propagation near in distance, long distance propagation, point-to-point prediction model-characteristics, cell site, antenna heights and signal coverage cells, mobile-to-mobile propagation.

Module IV
Introduction to Wireless LAN, Evolution of WLAN, Wireless Home Networking, Technologies for Home Area Network (HAN), Overview of IEEE 802.11, Reference Architecture, PHY and MAC Layer, Wireless ATM, HIPERLAN.

Module V
IEEE 802.15 WPAN, HomeRF, Bluetooth, Interference between Bluetooth and 802.11, Adhoc Networks, Introduction to 2.5 G and 3 G Networks.

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References:

1. Kaveh Pahlavan, Prashant Krishnamurthy "principles of Wireless Networks", PHI.
2. Qing- An Zeng, Dharma Prakash Agrawal "Introduction to Wireless and Mobile Systems" CENGAGE Learning.
3. Sumit Kasera, Nishit Narang, A P Priyanka "2.5 G Mobile Networks: GPRS and EDGE",
4. Dr. KAMILO FEHER "Wireless Digital Communications" , PHI
5. Jochen Schiller " Mobile Communications", PEARSON
6.Cellular and Mobile Communication by Lee (McGraw Hill)
7.Wireless Digital Communication by Dr. Kamilo Faher (PHI)

Course Outcomes:

CO1:To compare various wireless systems.

C02:To understand the cellular mobile system and its problems and its solution.

C03:To outline the cell coverage for various control modules.

C04:To give overview of IEEE reference architecture.

C05:To discuss various generations of mobile wireless technology.

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Subject Code	Subject Title	Maximum Marks allotted						Hours/week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz Assignment	End Sem	Lab Work					
IT705M B	Embedded Systems	70	20	10	-	-	100	3	1	-	4

Module I:
Introduction to Embedded System, Categories, Requirements, Applications, Challenges and Issues. Core of Embedded system, Memory, Sensors and Actuators, communication interface, embedded firmware, system components.

Module II:
Architecture of 8051 microcontroller, memory organization, registers, interrupts, addressing modes, instruction sets. Interfacing methods parallel I/O interface, Parallel Port interfaces, Memory Interfacing, High Speed I/o Interfacing, Interrupts, interrupt service routing, features of interrupts, Interrupt vector and Priority, timing generation and measurements,

Module III:
Fundamental issues of hardware software co-design, computational models in embedded design. Embedded firmware design approaches- Embedded firmware development languages- Assembly language based, high level language based, mixed. Programming in embedded C.

Module IV:
Embedded System Development Environment: KEIL Integrated Development Environment (IDE), Types of files Generated on Cross-Compilation, Disassembler/Decompiler, Simulators, Emulators and Debugging

Module V:
Real Time Operating Systems: Task and Task States, tasks and data, semaphores and shared Data Operating system Services, Message queues, Timer Function, Events, Memory Management, Interrupt Routines in an RTOS environment, Basic design using RTOS.

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References:-

1.Shibu K V, "Introduction to Embedded System", TMH.
2.David E Simon, "An Embedded Software Primer", Pearson education Asia, 2001.
3.Steven F. Barett, Daniel J. Pack, "Embedded Systems" Pearson education, First Impression 2008.
3.Vahid Frank, Tony Givargis, "Embedded System Design",
4.John Wiley and Sons, Inc. Dream Tech Software Team, "Programming for Embedded Systems" Wiley Publishing house
Inc.

Course Outcomes:

COl: To familiarize with Embedded System, Categories, Requirements, Applications

C02: To understand Architecture of 8051 microcontroller

C03: To understand Embedded firmware design approaches.

C04: To get exposure to Embedded System Development Environment

CO5: To study Real Time Operating Systems.

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COURSE CONTENT

Subject Code	Subject Title	Maximum Marks allotted						Hours/week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz Assignment	End Sem	Lab Work					
IT705M C	Distributed Systems	70	20	10	-	-	100	3	1	-	4

Module 1
Characterization of Distributed Systems: Introduction, Examples of distributed Systems, Resource sharing and the Web Challenges. System Models: Architectural models, Fundamental Models Theoretical Foundation for Distributed System: Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamport's & vectors logical clocks, Causal ordering of messages, global state, termination detection.
Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms.

Module II
Distributed Deadlock Detection: system model, resource Vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed dead lock detection, path pushing algorithms, edge chasing algorithms. Agreement Protocols: Introduction, System models, classification of Agreement Problem, Byzantine agreement problem, Consensus problem, Interactive consistency Problem, Solution to Byzantine Agreement problem, Application of Agreement problem, Atomic Commit in Distributed Database system.

Module III
Distributed Objects and Remote Invocation: Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study. Security: Overview of security techniques, Cryptographic algorithms, Digital signatures Cryptography pragmatics, Case studies: Needham Schroeder, Kerberos, SSL & Millicent. Distributed File Systems: File service architecture, Sun Network File System, The Andrew File System, Recent advances.

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Jabalpur Engineering College, Jabalpur
(Declared Autonomous by MP Govt., Affiliated to RGPV, Bhopal)
(AICTE Model Curriculum Based Scheme) With Provision for Internship
Bachelor of Technology (B.Tech.) VII Semester (Information Technology)

w.e.f. July 2024

Module IV

Transactions and Concurrency Control: Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control. Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Replication: System model and group communication, Fault tolerant services, highly available services, Transactions with replicated data.

Module V

Distributed Algorithms: Introduction to communication protocols, Balanced sliding window protocol, Routing algorithms, Destination based routing, APP problem, Deadlock free Packet switching, Introduction to Wave & traversal algorithms, Election algorithm.CORBA Case study: CORBA RMI, CORBA services

Books:

1. Singhal & Shivaratri, "Advanced Concept in Operating Systems", McGraw Hill
2. Coulouris, Dollimore, Kindberg, "Distributed System: Concepts and Design", Pearson Ed.
3. Ramakrishna,Gehrke," Database Management Systems", Mc Grawhill
6. Tenanuanbaum, Steen," Distributed Systems", PHI
7. Gerald Tel, "Distributed Algorithms", Cambridge University Pres Gerald Tel, "Distributed Algorithms", Cambridge University Press

Course Outcomes:

CO1: To familiarize with Characterization of Distributed Systems, System Models and Theoretical Foundation for Distributed System.

C02: To understand Distributed Deadlock Detection, Distributed Mutual Exclusion and Agreement Protocols.

C03: To understand Distributed Objects and Remote Invocation, Security and Distributed File Systems.

C04: To get exposure to Transactions and Concurrency Control in Distributed Transactions.

C05: To understand Distributed Algorithms and CORBA.

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