Jabalpur Engineering College, Jabalpur

Semester VII Credit Based Grading System (CBGS) w.e.f. July 2018
Scheme of Examination
Bachelor of Engineering B.E. (Information Technology)
Subject Wise Distribution of Marks and Corresponding Credits
Scheme of Examination w.e.f. July 2018 Acadamic Session 2018-19

S.No.	Subject Code	Subject Name & Title	Maximum Marks Allotted					Total Marks	Hours/Week			Total Credits	Total Marks
			Theory			Practical							
			End. Sem.	Mid Sem. MST	Quiz, Assignment	End Sem.	Lab Work		L	T	P		
1	IT7001	Cloud Computing	70	20	10	30	20	150	3	1	2	6	
2	IT7002	Distributed System	70	20	10	30	20	150	3	1	2	6	
3	IT7003	Machine Learning	70	20	10	30	20	150	3	1	2	6	
4	IT7004	Elective-III	70	20	10	-	-	100	3	1	-	4	
5	IT7005	Elective-IV	70	20	10	-	-	100	3	1	-	4	
6	IT7006	Project-I	-	-	-	60	40	100	-	-	4	4	
7	IT7007	Industrial Training (Two Weeks)	-	-	-	30	20	50	-	-	2	2	
		Total	**350**	**100**	**50**	**180**	**120**	**800**	**15**	**5**	**12**	**32**	**800**

MST: Minimum of two mid semester tests to be conducted. **L: Lecture** **T: Tutorial** **P: Practical**

Department Elective-III (Four Subjects)			Department Elective-IV (Four Subjects)	
S.No.	Subject Code	Subject Name	Subject Code	Subject Name
1	IT7004A	Simulation & Modeling	IT7005A	Artificial Intelligence
2	IT7004B	Advance Computer Architecture	IT7005B	Wireless & Mobile Communication
3	IT7004C	Real Time System	IT7005C	Advanced Database Management System
4	IT7004D	Soft Computing	IT7005D	Digital Signal Processing

Controller (Exam)
Jabalpur Engineering College
Jabalpur - 482 011 (M.P.)

Registrar (Academic)
for Principal
Jabalpur Engineering College
Jabalpur - 482 011 (M.P.)

DEAN
Academic
JEC, Jabalpur (M.P.)

Principal
Jabalpur Engineering College
Jabalpur - 482 011 (M.P.)

Jabalpur Engineering College, Jabalpur

(Credit Based Grading System based scheme)

Bachelor of Engineering (CBGS) Semester: VII (Information Technology)

(w.e.f. July 2018)

Subject Code	Subject Name & 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					
IT7001	Cloud Computing	70	20	10	30	20	150	3	1	2	6

UNIT I - Cloud Introduction

Cloud Computing Fundamentals: Cloud Computing definition, Types of cloud, Cloud services: Benefits and challenges of cloud computing, Evolution of Cloud Computing , usage scenarios and Applications , 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.

UNIT 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. Introduction to MapReduce, HDFS, Hadoop Framework.

UNIT 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 , VMWare, Virtual Box, Hyper-V.

UNIT 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.

UNIT 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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Department of Information Technology

Semester: VII SEM

Subject: Cloud Computing (IT-7001)

Course Objectives

1. To understand the benefits and the challenges of cloud computing.
2. To understand the types of cloud services.
3. To outline about the need and types of virtualization.
4. To discuss collaborating with the cloud.
5. To analyze the security challenges and standards for security and applications.

CEO\PEO	1	2	3	4	5	6
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Bachelor of Engineering (CBGS) Semester: VII (Information Technology)

(w.e.f. July 2018)

Subject Code	Subject Name & 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					
IT7002	Distributed System	70	20	10	30	20	150	3	1	2	6

Unit–I : 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.

Unit–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.

Unit–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.

Unit–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

Unit –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

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Department of Information Technology

Semester: VII SEM

Distributed Systems (IT-7002)

Course Objectives

1. To give overview of distributed system and its characteristics.
2. To understand various distributed deadlock detection techniques.
3. To outline the communication between distributed objects and distributed file system.
4. To understand the transaction and concurrency control.
5. To give overview of various distributed algorithms.

CEO\PEO	1	2	3	4	5	6
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Bachelor of Engineering (CBGS) Semester: VII (Information Technology)

(w.e.f. July 2018)

Subject Code	Subject Name & 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					
IT7003	Machine Learning	70	20	10	30	20	150	3	1	2	6

Unit I- Introduction of machine learning, mathematical concepts: random variables and probabilities, probability distributions, high-dimensional spaces, overview of machine learning, supervised, semi-supervised, unsupervised learning, inductive and transductive frameworks

Unit-II- Machine Learning Algorithm:- Introduction, unsupervised learning: Association rule mining, K-means, K-medoid. Classification: 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

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

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

Unit 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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Semester: VII SEM

Machine Learning (IT-7003)

Course Objectives

1. To introduce with the mathematical foundations of machine learning.
2. To understand and outline various machine learning algorithms and their classification.
3. To give insights of the practical aspects in machine learning, data processing and accuracy establishment.
4. To discuss about some special topics PAC objects.

CEO\PEO	1	2	3	4	5	6
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Subject Code	Subject Name & 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					
IT7004A	(Elective-III) Simulation & Modeling	70	20	10	-	-	100	3	1	-	4

Unit-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.

Unit-II : Probability Concepts in Simulation: Stochastic variables, discrete and continuous probability functions, Distributed Random numbers, generation of random numbers-Uniform and Non Uniform Random numbers, variance reduction techniques-Introduction, Common Random numbers- Rationale, Applicability and Synchronization.

Unit-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 M/M/1 queues. Application of queuing theory in computer system like operating systems, computer networks etc.

Unit-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.

Unit-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.

References:

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

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Semester: VII SEM

Simulation and Modeling (IT 7004, A)

Course Objectives

1. To understand the principles used in modeling.
2. To understand the probability concepts used in simulation
3. To give overview of discrete event simulation.
4. To introduce simulation languages GPSS, SIMSCRIPT.
5. To discuss queuing theory and its applications in computer system.

CEO\PEO	1	2	3	4	5	6
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Subject Code	Subject Name & 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					
IT7005B	(Elective-IV) Wireless & Mobile Communication	70	20	10	-	-	100	3	1	-	4

Unit 1 : 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.

Unit 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.

Unit 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.

Unit 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.

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

References:

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

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Semester: VII SEM

Subject: Wireless and Mobile Communication (IT70058)

Course Objectives

1) To compare various wireless systems.
2) To understand the cellular mobile system and its problems and its solution.
3) To outline the cell coverage for various control modules.
4) To give overview of IEEE reference architecture.
5) To discuss various generations of mobile wireless technology.

CO/PEO	1	2	3	4	5	6
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