INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

SCHEME OF STUDIES AND EXAMINATION

M.TECH 1st YEAR (COMPUTER SCIENCE & ENGINEERING)

SEMESTER 1st

CBCS Scheme effective from 2019-20

Sr. No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)	No of hours/ week
			L	T	P	Total Credits	Marks of Class works	Theory	Practical	Total		
1	MCSE101	Data Communication and Computer Networks	4	0	-	4	50	100	-	150	3	4
2	MCSE102	Advanced Operating Systems	4	0	-	4	50	100	-	150	3	4
3	MCSE103	Advanced Database Management System	4	0	-	4	50	100	-	150	3	4
4	MCSE104	Data Warehouse and Mining	4	0	-	4	50	100	-	150	3	4
5	MCSE105	Mathematical Foundation of Computer Science	4	0	-	4	50	100	-	150	3	4
6	MCSE106	Seminar	-		-	1		-	-	25		-
7	MCSE107	Advanced Operating Systems Lab	-	-	2	2	50	-	50	100	3	2
8	MCSE108	Advanced Database Management System Lab	-	-	2	2	50	-	50	100	3	2
9	MCSE109	Self Study Paper				1				25		
		TOTAL	**26**									

NOTE:

Examiner will set nine question in total. Question one will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

SCHEME OF STUDIES AND EXAMINATION

M.TECH 1st YEAR (COMPUTER SCIENCE & ENGINEERING)

SEMESTER 2nd

CBCS Scheme effective from 2019-20

Sr. No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)	No of hours /week
			L	T	P	Total Credits	Marks of Class works	Theory	Practical	Total		
1	MCSE201	Soft Computing	4	0	-	4	50	100	-	150	3	4
2	MCSE202	Algorithm Design	4	0	-	4	50	100	-	150	3	4
3	MCSE203	Seminar	-		-	1	25	-	-	25	-	-
4	MCSE204	Soft Computing Lab	-	-	2	2	50	-	50	100	3	2
5	MCSE205	Algorithm Design Lab	-	-	2	2	50	-	50	100	3	2
6	MCSE206A or MCSE206B or MCSE206C or MCSE206D	Elective-1 (DCEC)	4	0	-	4	50	100	-	150	3	4
7	MCSE207	Foundation Elective				2						2
8	MCSE208	Self Study Paper				1				25		
			20									

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

Elective 1 : Choose any one from the following papers MCSE206A Mobile and Wireless Communication

MCSE206B Optimization Techniques

MCSE206C Discrete Mathematics

MCSE206D Internet and Web Development

A candidate has to select this paper from the pool of Foundation Electives provided by the University.

General Instructions

1. **Seminar**

Max.Marks-25

Students are required to prepare a presentation on any topic, not from syllabus, assigned by the teacher concerned in the department on the theme/topic such as review of research papers/articles published in national or internal journal or any other research based paper in his/her area of interest. Every candidate will have to deliver a seminar of 15-20 minutes duration on the assigned topic. The seminar will be delivered in the presence of students and teachers of the department on any fixed week day of the semester.
The seminar will be evaluated by an internal committee of two internal teachers, constituted by the Chairperson of the Department. The evaluation (internal evaluation only) will be based on the presentation of the student, depth of subject matter of the topic and answer to questions. There will be a Coordinator to be nominated by the Chairperson of the Department among the teachers of the Department..

Distribution of marks will be as follows:
1. Presentation = 10 Marks

2. Relevancy & Depth of subject matter of the topic = 10 Marks

3. Answers to the Questions = 5 Marks

2. **Self Study Paper**

The objective of this course is to create habits of reading books and to develop writing skills in a manner of creativity and originality. The students will select a topic of their interest with consultation with their teachers/In charge/mentors. After selecting a suitable title for the paper, the student will be required to prepare a hand written report about 6-10 pages in his/her own handwriting. The student will be required to submit the report after getting it checked by the concerned teacher and will be asked to resubmit the report after making the required correction (s) if any before the commencement of the examination of that semester. The structure of the paper will include the following:

- Introduction
- Main Body
- Conclusion

The thoughts presented in the paper must be original work of the students.
The paper will be evaluated by the panel (one external and one internal examiner) to be appointed by the Chairperson of Department from the prescribed panel of the University.
The evaluation of Self Study paper will be done as given below:

- Evaluation of the paper 15 Marks
- Viva-voce on the paper 10 Marks
- Total 25 Marks

MCSE101 DATA COMMUNICATION AND COMPUTER NETWORKS

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprise of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Data communication: Digital and analog communication, Transmission modes, serial and parallel communication, packet switching, circuit switching and message switching

Network models: OSI and TCP/IP model, OSI vs TCP/IP

MAC: ALOHA, CSMA, CSMA/CD

UNIT 2

Network Layer:- ARP, RARP, ICMP, IGMP, IPv4, IPv6, IPv4 addressing, classful addressing, CIDR – Introduction, CIDR addressing, CIDR address blocks and Bit masks, subnets and super netting, IPv6 addressing, addressspaceallocation, globalunicastaddresses.

Routing Algorithms:- Distance vector Routing, Link State Routing, Path Vector Routing, Hierarchal Routing, RIP, OSPF, BGP.

UNIT 3

Transport Layer:-Transport Layer Services,UDP, TCP Protocol, TCP services, TCP features, connection management, congestion control SCTP Protocol, SCTP services, SCTP features, an SCTP association.

Application layer:- SMTP, POP, IMAP, and MIME,DHCP, DHCP operation, Configuration FTP, SSH.

UNIT 4

Network Management and Security:- Congestion control, Quality of services ,SNMP, , Ciphers-traditional, modern, asymmetric, public and private key, key management, digital signature, Network Layer Security, Transport Layer Security, Application Layer security, Firewall, VPN

References:

1. Computer Networks, Tanenbaum Andrew S, International edition,
2. TCP/IP protocol suite, Behrouz A. Forouzan , TMH publication
3. Data Communications and Networking, Behrouz A. Forouzan, TMH
4. Computer Networking: A Top-Down Approach, Kurose and Ross.
5. Computer Networks – A System Approach, Larry L. Peterson & Bruce S. Davie,

MCSE102 ADVANCED OPERATING SYSTEMS

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Introduction: Operating System Concept, Functions of an Operating System, Design Approaches, Types of Advanced Operating System - Synchronization Mechanisms, Concept of a Process, Concurrent Processes, The Critical Section Problem, Other Synchronization Problems, Language Mechanisms for Synchronization, Axiomatic Verification of Parallel Programs - Process Deadlocks - Preliminaries, Models of Deadlocks, Resources, System State, Necessary and Sufficient conditions for a Deadlock, Systems with Single-Unit Requests, Consumable Resources, Re-usable Resources.

UNIT 2

Distributed Operating Systems: Introduction, Issues, Communication Primitives, Inherent Limitations - Lamport's Logical Clock; Vector Clock; Causal Ordering; Global State; Cuts; Termination Detection. Distributed Mutual Exclusion, Non-Token Based Algorithms, Lamport's Algorithm - Token-Based Algorithms, Suzuki-Kasami's Broadcast Algorithm, Distributed Deadlock Detection, Issues, Centralized Deadlock-Detection Algorithms - Distributed Deadlock-Detection Algorithms. Agreement Protocols, Classification - Solutions, Applications.

Distributed Resource Management: Distributed File systems, Architecture, Mechanisms, Design Issues, Distributed Shared Memory, Architecture, Algorithm, Protocols - Design Issues. Distributed Scheduling, Issues, Components, Algorithms.

UNIT 3

Failure Recovery and Fault Tolerance : Basic Concepts-Classification of Failures, Basic Approaches to Recovery; Recovery in Concurrent System; Synchronous and Asynchronous Check-pointing and Recovery; Check pointing in Distributed Database Systems; Fault Tolerance; Issues - Two-phase and Non-blocking Commit Protocols; Voting Protocols; Dynamic Voting Protocols

UNIT 4

Multiprocessor and Database Operating Systems : Structures, Design Issues, Threads, Process Synchronization, Processor Scheduling, Memory Management, Reliability / Fault Tolerance; Database Operating Systems, Introduction, Concurrency Control, Distributed Database Systems, Concurrency Control Algorithms.

Recommended Books:

1. MukeshSinghal and N. G. Shivaratri, "Advanced Concepts in Operating Systems", McGrawHill, 2000
2. Abraham Silberschatz, Peter B. Galvin, G. Gagne, "Operating System Concepts", Sixth Addison n Wesley Publishing Co., 2003.
3. Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Addison Wesley, 2001.

MCSE103 ADVANCED OPERATING SYSTEMS

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Introduction: Architecture, Advantages, Disadvantages, Data models, relational algebra, SQL, Normal forms. **Query Processing:** General strategies for query processing, transformations, expected size, statistics in estimation, query improvement. Query evaluation, view processing, query processor.

UNIT 2

Recovery: Reliability, Transactions, recovery in centralized DBMS, reflecting updates, Buffer management logging schemes, disaster recovery. **Concurrency:** Introduction, Serializability, Concurrency control, Locking schemes, Timestamp based ordering, Optimistic, Scheduling, Multiversion techniques, Deadlocks.

UNIT 3

Object Oriented Database Development: Introduction, Object definition language, creating object instances, Object query language. **Distributed Database:** Basis concepts, options for distributing a database distributed DBMS.

UNIT 4

Data Warehousing: Introduction, basis concepts, data warehouse architecture, data characteristics, reconciled data layer, data transformation, derived data layer, user interface. **Object Relational Databases:** Basic Concepts, Enhanced SQL, Advantages of object relational approach.

References:

1. An introduction to database systems by Bipin C. Desai, Galgotia Publications.
2. Modern Database Management by Feffery A Liofer, Mary B. Prescotl, Fred R Mcfadden, 6th edition, Pearson Education.
3. Principles of distributed database systems, by M. Tamer & Valduriez, 2nd editon, LPE Pearson education.
4. Database system concepts by Korth.-

MCSE104 DATAWAREHOUSE AND MINING

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Data warehousing: Introduction, Operational data stores, ETL, Data warehouses – design guidelines for data warehouse implementation, Data warehouse metadata; OLAP – introduction, Characteristics, Multidimensional view and data cube, Data cube operations,

UNIT 2

Data mining: Introduction, association rules mining, Naive algorithm, Apriori algorithm, direct hashing and pruning (DHP), Dynamic Item set counting (DIC), Mining frequent pattern without candidate generation(FP, growth), performance evaluation of algorithms,

UNIT 3

Classification: Introduction, decision tree, tree induction algorithm – split algorithm based on information theory, split algorithm based on Gini index; naïve Bayes method; estimating predictive accuracy of classification method; classification software, software for association rule mining; case study; KDD Insurance Risk Assessment

UNIT 4

Cluster analysis: Introduction, partitional methods, hierarchical methods, and density based methods, dealing with large databases, cluster software.

Web Data Mining: Web Terminology and Characteristics, Locality and Hierarchy in the web, Web Content Mining, Web Usage Mining, Web Structure Mining, Web mining Software.

References:

1. Han J., Kamber M. and Pei J., Data mining concepts and techniques, Morgan Kaufmann Publishers (2011) 3rd ed.
2. . Pudi V., Krishana P.R., Data Mining, Oxford University press, (2009) 1st ed.
3. Adriaans P., Zantinge D., Data mining, Pearson education press (1996), 1st ed.
4. Pooniah P., Data Warehousing Fundamentals, Willeyinterscience Publication, (2001), 1st ed

MCSE105 MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3 hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Regular Languages: Finite automata, DFA, NFA, Equivalence of DFA & NFA. An application, Mealy and Moore Models, Regular expressions and languages. Context free languages: CFGs, Applications, Ambiguity removal, CNF, GNF.

UNIT 2

PushDown Automata: Basics of PDA, Acceptance By PDA, PDA and CFL, Parsing and PDA: Top Down Parsing and Bottom up Parsing

UNIT 3

Turing Machine: Turing machines, variants of TMs, Restricted TMs, TMs and Computers.**Decidability:** Decidable languages, decidable problems concerning Context free languages, the halting problem, halting problem is undecidable.

UNIT 4

Reducibility and Computability: Undecidable problems from language theory – Regular expressions, Turing machines, Reduction. A simple undecidable problem (PCP), Primitive recursive functions, tractable decision problems, theory of Optimization, Church- Turing Thesis.

References:

1. Introduction to Theory of Computation – Michael Sipser (Thomson Nrools/Cole)
2. Introduction to Automata Theory, Languages and Computations – J.E. Hopcroft, Rajeev Motwani & J.D. Ullman (Pearson Education Asia), 2nd Edition.
3. Theory of Computation by Peter Linz
4. Introduction to languages and theory of computation – John C. Martin (MGH)

MCSE106 Seminar

L T P		Marks	Credits
- - -	Sessional :	-	1
	Total :	25	

A candidate has to present a seminar on a recent topic/ technology/ research advancement and has to submit a seminar report. The marks will be given on the basis of seminar report, contents of the presentation, communication and presentation skills.

MCSE107 ADVANCE OPERATING SYSTEM LAB

			Marks	Credits
L T P	Exam	:	50	2
- - 2	Sessional	:	50	
	Total	:	100	

A student has to perform 10-12 practicals based on theory paper.

MCSE108 ADVANCE DATABASE MANAGEMENT SYSTEM LAB

			Marks	Credits
L T P	Exam	:	50	2
- - 2	Sessional	:	50	
	Total	:	100	

A student has to perform 10-12 practicals based on theory paper.

MCSE201 SOFT COMPUTING

			Marks	Credits
L T P	Exam	:	100	4
4 - -	Sessional	:	50	
	Total	:	150	4

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Neural Networks : History, Overview of Biological Neuro-System, Mathematical Models of Neurons, ANN architecture, Learning rules, Gradient Descent Algorithm, Learning Paradigms-Supervised, Unsupervised and Reinforcement Learning, ANN Training Algorithms-Perceptrons, Training Rules, Delta, Back Propagation Algorithm, Multilayer Perceptron Model, Hopfield Networks, Associative Memories, Applications of Artificial Neural Networks.

UNIT 2

Fuzzy Logic: Introduction to fuzzy Logic, Classical and Fuzzy Sets, Overview of Classical Sets, Membership Function, Fuzzy Rulegeneration.

Operations on Fuzzy Sets: Compliment, Intersection, Union, Combination of Operations, Aggregation Operation.

UNIT 3

Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on Intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations.

Classical Logic, Multi-Valued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges.

UNIT 4

Uncertainty Based Information: Information & Uncertainty, Nonspecificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets.

References:

1. Neural Networks SimonHaykin
2. Neural Networks-Kosko.
3. Principles of Soft Computing -Dr. S. N. Sivanandam and Dr. S. N. Deepa,
4. Fuzzy Logic & Fuzzy Sets Klir& Yuan
5. Neutral Networks-Satish Kumar

MCSE202 ALGORITHM DESIGN

		Marks	Credits
L T P	Exam :	100	4
4 - -	Sessional :	50	
	Total :	150	4

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Foundation & Data Structure:

Foundation & Elementary Data Structure: Algorithms, Performance analysis: Space & time complexity, Growth of functions, Divide & Conquer, Recurrence Equations, Basic elements of data structure like Stacks & Queues, Trees, Graphs, Linked List, Sorting & Order statistics. Data Structure: Dynamic sets & searching: Introduction, Array doubling, Amortized time analysis, R-B trees, Hashing, Dynamic equivalence relations & Union-Find programs, Priority queues with a decrease key operation.

Graph & graph traversals: DFS, strongly connected components, Bi-connected components.

UNIT 2

Advanced Design & Analysis Techniques:

Greedy & Dynamic Method: General methods, Knapsack problem, Job sequencing with deadlines, Minimum cost spanning trees, Optimal merge patters, Single-source shortest path, 0/1 Knapsack, Multistage graphs, All-pair shortest path, Optimal binary search trees, Travelling salesperson problem, Flow shop scheduling.

Backtracking & Branch and Bound: General methods, 8 Queens problem, Sum of subsets, Graph coloring, Hamiltonian cycles, Knapsack problem, Travelling salesperson problem, Efficiency consideration.

UNIT 3

NP-Hard & NP-Complete Problems: Basic concepts, Cook's Theorem, NP-hard graph problem, NP-Hard scheduling problems.

String Matching: Introduction, A straight forward solution, The Knuth-Morris-Pratt algorithm, The Boyer-Moore algorithm, approximate string matching.

UNIT 4

Parallel Algorithms: Introduction, Parallelism, The PRAM, and other models, some simple PRAM algorithms, Handling write conflicts, Merge and Sorting, Finding connected components.

Approximation algorithms: Introduction, Absolute approximations, ϵ- approximations, Polynomial time approximation schemes, Fully Polynomial time approximations schemes.

References:

1. Computer Algorithms: Introduction to design and analysis (3rd edition) by Sara Baase and Allen Van Gelder , Pearson, 2000.
2. Fundamentals of Algorithms by Gilles Brassard and Paul Bratley
3. Design and Analysis of Algorithms (Computer science Series) by Jeffrey D. Smith Publ.
4. Fundamentals of Computer algorithms, Ellis Horowitz and Sratj Sahnim 1978, Galgotia publ.
5. Algorithms Design (PIE) by Eva Tardos and Jon Klienberg, person.
6. Introduction to Algorithms, Thomash Cormen, Harles E leiserson and Ronald L rivest: 1990, TMH.

MCSE203 **Seminar**

L T P		Marks	Credits
- - -	Sessional :		1
	Total :	25	

A candidate has to present a seminar on a recent topic/ technology/ research advancement and has to submit a seminar report. The marks will be given on the basis of seminar report, contents of the presentation, communication and presentation skills.

MCSE204 **SOFT COMPUTING LAB**

		Marks	Credits
L T P	Exam :	50	2
- - 2	Sessional :	50	
	Total :	100	

A student has to perform 10-12 practicals based on theory paper.

MCSE205 **ALGORITHM DESIGN LAB**

		Marks	Credits
L T P	Exam :	50	2
- - 2	Sessional :	50	
	Total :	100	

A student has to perform 10-12 practicals based on theory paper.

MCSE206A **MOBILE AND WIRELESS COMMUNICATION**

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Application, history, market, reference model and overview. Wireless Transmission- Frequencies, signals, antennae, signal propagation, multiplexing, modulation, spread spectrum, cellular system.

MAC and Telecommunication System: Specialized MAC, SDMA, FDMA , TDMA – Fixed TDM, classical ALOHA, Slotted, ALOHA, CSMA ,DAMA, PKMA, reservation TDMA. Collision avoidance, polling inhibit sense multiple access. CDMA, comparison, CSM-mobile services, architecture radio, interface, protocol, localization, calling handover, security, new data services, Introduction to W'LL.

UNIT 2

Satellite and Broadcast Systems: History, Applications, GEO, LEO, MEO, routing, localization, handover in satellite system. Digital audio and video broadcasting. **WIRELESS LAN:** IEEE 802 11- System and protocol architecture, physical layer. MAC layered management. Bluetooth- User scenarios, physical layer, MAC Layer, networking, security and link management.

UNIT 3

Mobile Network Layer: Mobile IP-goals, assumptions, requirement, entities, terminology, IP packet delivery. Agent advertisement and discovery, registration, tunneling, encapsulation, optimization, reserve tunneling, IPv6.DHCP.Adhoc Networks, Routing, destination sequence distance vector, dynamic source routing, hierarchical algorithm, algorithm, algorithm metric.

UNIT 4

Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping; TCP, Mobile TCP fast retransmission, Transaction oriented TCP. **Support for Mobility:** File, system, WWW-HIT, HTML, system architecture. WAP-architecture, Wireless datagram, protocol, wireless transport layer security, wireless transaction protocol, application environment, telephony application.

References:

1. Jochen Schiller,"MobileCommunication",Pearson Education,2002
2. LEE,"Mobile Cellular Telecommunications " McGRAW-Hill,2nd Edition.
3. Wireless Communications : Theodore S Rappaport; Pearsons

MCSE206B OPTIMIZATION TECHNIQUES

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Linear Programming: Simplex Method, Big M-Method, Duality in Linear Programming, Sensitivity Analysis, Revised Simplex Method, Two-Phase Simplex Method, Dual Simplex Method. Integer Linear Programming: Branch and Bound Algorithms, Gomory Cutting Plane Method.

UNIT 2

Transportation Problems: Types of Transportation Problems, Mathematical Models, Transportation Algorithms. **Assignments:** Definition, Differences between Transportation and Assignment Models, Representation Assignment Problem as Transportation Problem and as Linear Programming, Assignment Algorithm -Hungarian Method

UNIT 3

Non-Linear Programming: Classical optimization Techniques, NLP with constraints: Graphical Solution, Multivariable Optimization with Equality constraints (Lagrange Multipliers Method), with inequality constraints-Kuhn-Tucker conditions, Quadratic Programming and Separable Programming: Standard form, Wolf's Method, Beale's Method

.Search Method for Unconstrained Non-Linear Programming Problems.

UNIT 4

Reliability: Basic concepts, conditional failure rate function, Failure time distributions, certain life Models, Reliability of a system in terms of the reliability of its components, series system, parallel system. Queuing Theory: Introduction, elements or Parameters of Queuing system, Steady state Balance Equation, Kendall's Notation for Representing Queuing Models, Model!:Single server Model(M/M/1/∞ / ∞ /FCFS), Model 2:M/M/1/∞/N/FCFS) Finite Capacity Queue System,Model3:Multi-server Model, Model4: Machine Servicing Model.

References:

1. Optimization Techniques by C.Mohan and Kusum Deep, New Age International
2. Operations Research by K.Rajagopal, PHI, Inida.
3. Reliability Engineering by K K Aggarwal, Springer.

MCSE206C DISCRETE MATHEMATICS

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Propositions, Logical Connectives, Conditionals and Biconditionals, Tautologies, Logical Equivalences, Predicates, Quantifiers, Inference theory, Validity Probability, Information and Mutual Information

UNIT 2

Poset, Lattices, Principle of Duality, Basic Properties of Lattices, Some Special Lattices, Boolean Algebras, Identities of Boolean Algebra, Uniqueness of Finite Boolean Algebras, Boolean Functions and Boolean Expressions, Normal Forms, The Karnaugh Map method, Application of Boolean Algebra to Switching Circuits

UNIT 3

Introduction to Graphs, Types of Graphs, Representation of graphs, Paths and Circuits, Graph Traversals, Shortest Path in Weighted Graphs, Dijkstra Algorithm, Euler Graphs, Fleury's Algorithm, Hamiltonian Graphs, Travelling Salesman Problem, Planar Graphs, Kuratowski's Two Graph, Euler's Theorem, Colouring of Graphs, Transport Networks Trees, Rooted Trees, Representation of Algebraic Expressions by Binary Trees, Binary Search Trees, Spanning Trees and Cut-Sets, Minimum Spanning Tree, Kruskal's Algorithm, Prim's Algorithm

UNIT 4

Languages, Phrase Structure Grammars, Types of Grammars and Languages, Finite State Machines, Equivalent Machines, Finite State Machines as Language Recognizers, Finite State Languages and Type-3 Languages, Turing Machine

References:

1. Elements of Discrete Mathematics: A Computer Oriented Approach, C. L. Liu and D. P. Mohapatra, McGraw Hill Education

2. Discrete Mathematical Structures with Applications to Computer Science, J. P Tremblay and R.Manohar, Tata McGraw Hill Edition
3. Mathematical Structures for Computer Science, J. L. Gersting, Computer Science Press, New York
4. Discrete Mathematical Structures, B. Kolman, R. C. Busby and S Ross, PHI
5. Discrete Mathematics, Babu Ram, Vinayak Publishers and Distributors, Delhi
6. Discrete Mathematics, SemyourLipschutz and Marc Lipson, Schaum's outline
7. Discrete Mathematics, R.K. Bisht and H. S. Dhami, Oxford University Press

MCSE206D **INTERNET AND WEB DEVELOPMENT**

		Marks	Credits
L T P	**Exam:**	100	4
4 - -	**Sessional:**	50	
	Total:	150	4

Duration of Exam: 3hrs.

NOTE: Examiner will set nine question in total. Question One will be compulsory and will comprises of all section and remaining eight questions to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT 1

Introduction: Internet protocol model, Internet addresses, IP Routing concepts, Table Driven and next hop routing, other routing related protocols, Internet Access through PPP, SLIP, WWW

UNIT 2

Router technology: Hubs, Bridges, Routers, Routing Protocols, Routing security, Switch based routing, Routing in unicast environment, multicasting, mobile routing.

UNIT 3

Web server and Browser: Web Servers (IIS/PWS & Apache),HTTP request types, system architecture, client-side scripting, accessing web servers, HTTP, secure HTTP, Secure Sockets Layer, WWW Proxies, Web Browser, Bookmarks, Cookies, Progress Indicators, Customization of Browsers, Browsing Tricks, Next Generation Web Browsing, Search Engines, Architecture of Search Engines, Search Tools, Web Crawlers

UNIT 4

Website Development: DHTML, XHTML, AJAX, XML: Structuring data, XML namespaces, DTD and schemas, XML variables, DOM methods, simple API for XML, web services, and application of XML. Active Server Pages (ASP): How ASP works, ASP objects, file system, objects, ASP.NET

References:

1. Fundamentals of the Internet and the World Wide Web, Raymond GreenLaw and Ellen Hepp-2011, TMH.
2. Internet and World Wide Web Programming, Deitel, Deitel and Neito, 2000, Pearson Education.

3. Beginning XHTML by Frank Boumpery, Cassandra Greer, Dave Ragett, Jenny Ragett, Subastia Schintenbaumer and Ted Wugofski 2000,WROX Press(Indian Shroff Publication SPD)1st Edison.
4. Complete Reference Guide to Java Script, Aron Weiss,QUIE,1977.
5. Intranet and Internet Engg. By Minoli.