

Syllabi & Scheme of Examination

Under Choice Based Credit System

Effective from session 2017-18

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]
18/5/2017

MASTER OF TECHNOLOGY

COMPUTER SCIENCE AND ENGINEERING

(Semester 1st and 2nd)

Department of Computer Science and Applications

Chaudhary Devi Lal University, Sirsa

[Handwritten signature]
18/5/17

[Handwritten signature]
18/5/17

[Handwritten signature]

Department of Computer Science & Applications
Chaudhary Devi Lal University, Sirsa (Haryana)
Scheme of Examination for Master of Technology in Computer Science and Engineering
(M. Tech. CSE)
under Choice Based Credit System
M.Tech-1st First Semester

Paper Code	Nomenclature of Paper	Credit	Int Marks	Ext Marks	Total Marks
MT-FT-11	Advanced Data Structure	4	30	70	100
MT-FT-12	Advanced Operating Systems	4	30	70	100
MT-FT-13	Advanced Computer Architecture	4	30	70	100
MT-FT-14	Advanced Database Systems	4	30	70	100
MT-FT-15	Advanced Software Engineering	4	30	70	100
MT-FT-16	S/W Lab – I Based on MT-FT-11	2.5	30	45	75
MT-FT-17	S/W Lab – II Based on MT-FT-14	2.5	30	45	75
MT-FT-18	Seminar	2	50	-	50
Total		27			700

M.Tech-2nd Semester

Paper Code	Nomenclature of Paper	Credit	Int Marks	Ext Marks	Total Marks
MT-FT-21	Advanced Computer Networks	4	30	70	100
MT-FT-22	Object Oriented Analysis And Design Using UML	4	30	70	100
MT-FT-23	Advanced Algorithmics	4	30	70	100
MT-FT-24	Theory Of Computation	4	30	70	100
MT-FT-25	Elective-I	4	30	70	100
MT-FT-26	S/W Lab – I Based On MT-FT-22	2.5	30	45	75
MT-FT-27	S/W Lab – II Based On MT-FT-23	2.5	30	45	75
MT-FT-28	Seminar	2	50	-	50
Total		27			700

ELECTIVE-I

- i) INFORMATION SECURITY
- ii) SOFT COMPUTING
- iii) HIGH PERFORMANCE NETWORKS

Note: During the first 3 semesters (semester I to semester III), students have to earn a total of 11 credits from Open Elective courses offered by various departments of the university. In each of the first three semesters of M.Tech the students will have register for and earn a minimum of 2 credits and a maximum of 6 credits.

Staff Council

[Signature]
18/5/2017

[Signature]
18/5/17

[Signature]

TQR

[Handwritten notes and signatures]
18/5/2017

MT-FT-11 Advanced Data Structures

L/T	P	Credit	Int	Ext
4	-	4	30	70

Note: Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

Unit-I

Basic Concepts of OOPs – Templates Function and class templates – Algorithms: performance analysis: time complexity and space complexity– ADT – List (Singly– Doubly and Circular) Implementation – Array – Pointer – Cursor Implementation

Unit-II

Stacks and Queues – ADT– Implementation and Applications – Trees – General– Binary – Binary Search – Expression Search – AVL – Introduction to Red Black trees and Splay tree – B-trees – Implementations – Tree Traversals

Unit-III

Set – Implementation – Basic Operations on Set – Priority Queue – Implementation – Graphs – Directed Graphs – Shortest Path Problem – Undirected Graph – Spanning Trees – Graph Traversals: hash table representation: hash functions: collision resolution: separate chaining: open addressing: linear probing: quadratic probing: double hashing: rehashing


Unit-IV

Searching Techniques – Sorting – Internal Sorting – Bubble Sort – Insertion Sort – Quick Sort – Heap Sort – Bin Sort – Radix Sort – External Sorting – Merge Sort – Multiway Merge Sort – Polyphase Sorting – Design Techniques – Divide and Conquer – Dynamic Programming – Greedy Algorithm – Backtracking – Local Search Algorithms

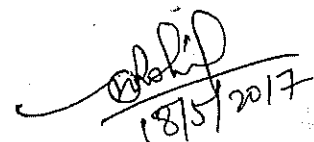
References:

- Mark Allen Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education, 2002.
- AhoHopcroft Ullman, Data Structures and Algorithms, Pearson Education, 2002.
- Horowitz Sahni, Rajasekaran, Computer Algorithms, Galgotia, 2000.
- Tanenbaum A.M., Langsam Y, Augenstein M.J., Data Structures using C & C++, Prentice Hall of India, 2002.
- Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
- Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and Mount, Wiley student edition, John Wiley and Sons.

Staff Council


18/11/17




18/11/2017

MT-FT-12 Advanced Operating System

L/T	P	Credit	Int	Ext
4	-	4	30	70

Note:-Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question. **Note:-**Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

Unit-I

Security and Protection: Security Threats, Attacks on Security, Security Violation through Parameters, Computer Worms, Computer Viruses, Security Design Principles, Authentication, Protection Mechanism, Encryption, Security in Distributed Environment. Graphical User Interface and the Operating System: Windowing Technology, Graphical User Interface, relationship between Operating System and the Windows, Components of GUI, requirement of a Windows based GUI

Unit-II

Distributed and Parallel Processing: Parallel Processing, Distributed Processing, Difference between Distributed and Parallel Processing, Advantages of Parallel Processing, Writing Programs for Parallel Processing, Machine Architecture supporting Parallel Processing, Operating System for Parallel Processors, Issues in Operating System in Parallel Processing.

Unit-III

Distributed Operating Systems: Architecture of Distributed Systems, Networking, Interprocess Communication Protocols, Distributed Computation Paradigm, Network Operating System, Design issues in Distributed Operating System; Theoretical issues in Distributed Systems, Distributed Control Algorithms, Distributed Mutual Exclusion, Distributed Deadlock Handling, Distributed Scheduling Algorithms, Recovery and Fault Tolerance. Distributed File System, Distributed system Security.

G. Goskar

18/5/17

Staff Council

18/5/2017

11/11/17

18/5/17

Unit-IV

Disk Performance Optimization: Moving Head Disk Storage, Disk Scheduling, Seek Optimization, Rotational Optimization, Disk Caching.

Processes: Process Model, Implementation of Processes, Threads, Inter-process Communication, Race Condition, Critical Section, Mutual Exclusion with Busy waiting, Sleep and Wakeup, Semaphores, Monitors, Message Passing. Classical IPC Problems, Process Scheduling, Round Robin, Priority, Multiple Queues, Shortest Job First, Guaranteed, Lottery, Real Time and Two-Level Scheduling.

References:

1. Operating Systems; Achyut S Godbole; Tata McGraw Hill Publishing Company Limited, New Delhi.
2. Operating Systems; A Concept based Approach; D. M. Dhamdhare; Tata McGraw Hill Publishing Company Limited, New Delhi.
3. Operating Systems-2nd Edition; H. M. Deitel; Pearson Education.
4. Operating Systems-Design and Implementation; Andrew S. Tanenbaum, Albert S. Woodhull; Prentice-Hall of India Private Limited, New Delhi.

Staff Council


18/5/17

P. G. Borkar

D. S. Borkar

A. K. Borkar

DDP

MT-FT-13 Advanced Computer Architecture

L/T	P	Credit	Int	Ext
4	-	4	30	70

Note:-Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

UNIT-I

Concurrent and Parallel Execution: Types and levels of parallelism, classifications of parallel architectures.

Instruction-Level-Parallel Processors: Dependencies between instruction. Principles of Pipelining. Pipelined instruction processing. Synchronous & asynchronous pipeline. Linear Pipeline-clocking & timing control, speedup, efficiency & throughput. Non linear pipeline-reservation table, latency analysis, collision free scheduling, internal data forwarding.

UNIT-II

Superscalar pipeline design- structure, data dependencies, pipeline stalling, in-order issue, out of order issue. VLIW architecture. Branch handling- delayed branching, branch processing, multiway branching, guarded execution. Code scheduling- basic block scheduling, loop scheduling, global scheduling.

UNIT-III

Memory Hierarchy Technology : inclusion, coherence and locality, virtual memory models, TLB, paging and segmentation, memory replacement policies, cache addressing models, cache performance issues. interleaved memory organisation.

Unit-IV

Shared-Memory MIMD architectures: Dynamic interconnection networks- shared path, switching networks- crossbar & multistage networks. Cache coherence problem, Hardware based cache coherence protocol-Snoopy cache protocol, directory scheme, hierarchical cache coherence protocol. UMA, NUMA, CC-NUMA and COMA multiprocessors.

References

- Hennessy J.D., Patterson D.A., "Computer Architecture A Quantitative Approach", Elsevier India.
- Sima D., Fountain T., Kasuk P., "Advanced Computer Architecture-A Design space Approach," Pearson Education.
- Hesham El-Rewini, MostafaAbd-El-Barr, "Advanced Computer Architecture and Parallel Processing", Wiley India Pvt. Ltd.
- Kai Hwang, "Advanced computer architecture - Parallelism, Scalability, Programmability", Tata McGraw Hill.

Staff Council

[Handwritten signature]
18/5/2017

[Handwritten signature]
18/5/17

MT-FT-14 Advanced Data Base System

L/T	P	Credit	Int	Ext
4	-	4	30	70

Note:-Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

UNIT - I

Database System Concepts and Architecture: Three - Schema Architecture and Data Independence, ER Diagrams, Naming conventions and Design Issues. Relational Model Constraints and Relational Database Schemas, EER model: Subclasses, Super classes, Inheritance, Specialization and Generalization, Constraints and characteristics of specialization and Generalization.

UNIT - II

Relational Model: Relational Model Concepts, Relational model Constraints and Relational Database Schemas, Relational Algebra: Operations from Set theory, Binary Relation Operations: Join and Division, SQL Data Definition and Data types; Specifying Basic Constraints and Queries in SQL, Views in SQL

UNIT - III

Informal design guidelines for Relational schemas, Functional Dependencies, Normal forms based on Primary keys :1NF,2NF,3NF and BCNF, Properties of Relational Decomposition, Multivalued dependencies and 4NF, JOIN dependencies and 5NF. Introduction to Object oriented Databases, Active and Spatial databases, Multimedia databases, Temporal databases

UNIT - IV

Introduction to Transaction processing concepts, Concurrency control techniques, Database recovery techniques: Deferred update and Immediate update, ARIES Recovery algorithm, Shadow paging, Database security issues, Distributed Database concepts and Client Server Architecture

Text Books:

1. Elmasri and Navathe, "Fundamentals of Database Systems", Pearson Education.

Reference Books:

- Date C.J., "An Introduction to Database Systems", Pearson Education.
- Hector G.M., Ullman J.D., Widom J., "Database Systems: The Complete Book", Pearson Education.
- Silberschatz A., Korth H., Sudarshan S., "Database System Concepts", Tata McGraw Hill.

Staff Council

18/18/17

18/15/2017

MT-FT-15 Advanced Software Engineering

L/T	P	Credit	Int	Ext
4	-	4	30	70

Note:-Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

Unit-I

Introduction: Life cycle models, Requirement Analysis and specification, Formal requirements specification, Fundamental issues in software design, goodness of design, cohesions, coupling, Function-oriented design.

Unit-II

Structured analysis and design, overview of object -oriented concepts, Unified Modeling Language, unified design process.

Unit-III

User interface design, coding standards and guidelines, code walkthrough and reviews, Unit testing, black box and white box testing, integration and system testing, software quality and reliability.

Unit-IV

SEI CMM, ISO 9001 and Six Sigma, clean room testing technique, Software maintenance issues and techniques. Software reuse. Client-Server software development.

Reference:

- Ivan Sommerville, Software Engineering, Addison Wesley.
- Pressman Roger, Software Engineering -A Practitioner's Approach.
- Richard Fairley, Software Engineering Concepts, Tata McGraw Hill.
- Pankaj Jalote, An Integrated Approach to Software engineering, Narosa Publication.

Staff Council

[Signature]
18/5/2017

[Signature]

[Signature]
18/5/17

[Signature]

[Signature]
Dankesh
[Signature]

MT-FT-21 Advanced Computer Networks

L/T	P	Credit	Int	Ext
4	-	4	30	70

Note:-Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

Unit-I

Review of Basic Network Architectures: OSI reference model, TCP/IP reference model, ATM reference model; Applications(WWW, Audio/Video Streaming, Video conference, Networked Games, Client/Server); Traffic Characterization (CBR, VBR); Switching Paradigms; Multiplexing; Error Control; Flow Control, FTH, DTH, PON, ISDN, DSL, CATV, SONET, Optical Networks.

Unit-II

Local Area Network Technologies: Fast Ethernet, Gigabit Ethernet, IEEE 802.11 WLAN, Bluetooth, Connecting LANs, VLANs, Internetworking: Interdomain Routing, BGP, IPv6, Multicast Routing Protocols, Multi Protocol Label Switching, Virtual Private Networks, High speed transport protocols, Quality of Service Mechanisms, Improving QoS in Internet, DiffServ and IntServ Architectures, RSVP.

Unit-III

Distributed Systems: Naming, DNS, DDNS, TCP, STCP, UDP, Protocols to Support Streaming Media, Multimedia Transport Protocols, Content Delivery Networks, Cryptography.

Unit-IV

Applications and Other Networking Technologies: RTP, RTSP, SIP, VoIP, Security Systems, SSH, PGP, TLS, IPSEC, DDoS Attack, Mitigation in Internet, Security in MPLS; Introduction to Cellular, Satellite and Ad hoc Networks.

References:

- Behrouz A. Forouzan, Data Communications and Networking, Fourth Ed., Tata McGraw Hill, 2006.
- Larry L. Peterson and Bruce S. Davie, Computer Networks: A Systems Approach, Fourth Ed., Morgan Kaufmann, 2007.
- Jean Walrand and PravinVaraiya, High Performance Communication Networks; 2nd Ed; Morgan Kauffman, 1999.
- Markus Hoffmann and Leland R. Beaumont, Content Networking: Architecture, Protocols, and Practice, Morgan Kauffman, 2005.

18/07/17
Staff Council
18/5/2017
J G Bostik
Rishi
Darius
18/07/17

MT-FT-22 Object Oriented Analysis Design Using UML

L/T	P	Credit	Int	Ext	benefits, phases and
4	-	4	30	70	

Note:-Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

Unit-1

Review of the traditional methodologies: advantages of object oriented over traditional methodologies, classes, objects, encapsulation, association, aggregation, inheritance, polymorphism, states and transitions.

Introduction to Objectory Software Development Process: Introduction, benefits, phases and iterations, elaboration stage, construction stage, transition stage.

Creating Use Case Diagrams: Actors and use cases, use case relationships, types of relationship, use case diagram, additional use case diagram in rational rose, activity diagram, transition, decision points, swimlanes.

Unit-2

Visual modeling using Unified Modeling Language(UML):Object Oriented Modeling.Introduction to Unified ModelingLanguage:History of UML, Overview of UML-Capabilities,Usage of UML.Introduction to Rational Rose CASE tool: Introduction, Importance of Rational rose,Capabilities of Rational Rose Case Tool.

Unit-3

Object Oriented Themes, Impact of an Object Oriented Approach,Object Model:Objects and ClassesLinks and Associations,Generalization and Inheritance as Restriction,Abstract Classes,Meta data and Constraints.Dynamic modeling: Events and States, Operations, Nested State Diagrams, Concurrency,Synchronization of concurrent activities. Functional modeling: Data flow diagrams,Specifying operations,Constraints Relation of Functional to Object and Dynamic models.

Unit-4

Object Oriented Methodology,Analysis,System Design,Object Design,Comparison of Methodology-Structured Analysis/Structured Design,Jackson Structured Design.

P. K. Boshle

P. K. Boshle

18/5/17

18/5/17

18/5/17

Staff Council

18/5/2017

18/5/2017

18/5/2017

10

References:

- Rumbaugh, J. et al., Object-Oriented modeling and Design, PHIndia, 1998
- UML User Guide, Grady Booch, James Rumbaugh, Ivar Jacobsan, 2000, Addison Wesley.
- Visual Modeling with Rational Rose 2000 and UML by Terry Quatranui Foreward by Grady Booch, 2000
- The Objectory Software Development process, Ivar Jacobsan, Grady Booch, James Rumbaugh, 1999, Addison Wesley.

Staff Council



18/5/2017

D. G. B. S. R.


V. L.

A. K. S. H.
D. K. S. H.




18/5/17





MT-FT-23 Advanced Algorithmics

L/T	P	Credit	Int	Ext
4	-	4	30	70

Note:-Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

UNIT - I

Algorithms: Role of algorithm in computing, Asymptotic Notations, Standard notations and common functions. Recurrence: The maximum-subarray problem, substitution and recursion-tree method for solving recurrences, master method for solving recurrences, Proof of the master theorem, Probabilistic Analysis and Randomized Algorithms.

UNIT - II

Sorting: Bubble sort, Heap, Building and maintaining heap, Heapsort, Quicksort, Lower bounds for sorting, Counting sort, radix sort, bucket sort. Advanced Data Structures: Splay Trees, Top-down splay trees, Red-black Trees, Deterministic skip lists, AA-Trees.

UNIT - III

Optimal binary search tree, Greedy algorithms: Huffman codes. Graph Algorithms: Storage of graphs, traversing a graph, Topological sort, Minimum Spanning Trees, Shortest path problems: Single source and All-pairs shortest path.

UNIT - IV

Miscellaneous Topics: Knapsack Problem and Memory functions, Approximate String Matching, Integer factorization, naïve-string matching, Rabin-karp string matching, String matching with finite automata, finding convex hull, Polynomial time, verification and reducibility, NP-completeness and proofs.

References:

- Cormen, Thomas, Leiserson, Introduction to Algorithms, Prentice Hall of India Learning.
- Horowitz, Ellis and Sahni, Sartaj, Fundamentals of Computer Algorithms, University Science Press.
- Anany Levitin, "Introduction to Design and Analysis of Algorithms", Pearson Education.
- Cooper A., "Computability Theory", Chapman and Hall/ CRC Press.
- Robert Sedgewick and Kevin Wayne, Algorithms 4e, Pearson Education India.
- Steven Skiena, The Algorithm Design Manual, Springer India.
- Reiter, Johnson, "Limits of Computation", Chapman and Hall/ CRC Press.

P. F. BOS & R

Staff Council
12/15/2017
18/5/17

Staff Council

Staff Council

MT-FT-24 Theory of Computation

L/T	P	Credit	Int	Ext
4	-	4	30	70

Note:-Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

UNIT - I

Introduction: Mathematical notations and terminology of sets, functions and relations, graph, string and language classification, Boolean logic properties and representation.

Finite state system: Finite Automata and its type, Two way finite Automata: Interconversion of automata and minimization. Regular expression, Arden's theorem, Pumping Lemma and its application, closure properties of regular sets.

UNIT - II

Context Free Language: Context free Grammars and Language, Simplification of context free grammars, Normal form, Pumping Lemma & its applications, closure properties of CFL's, pushdown automata, equivalence of PDA and CFG, Top down parsing, Bottom up Parsing.

UNIT - III

Turing Machine: Turing Machine, extended and restricted turing machine, time and space complexity in TM, construction of TM, computational complexity and non-computational complexity, TMs and computers, Context sensitive Language, Linear bounded automata.

UNIT - IV

Tractable and Possibly Intractable Problems: Growth rate functions, languages and complexity classes, decision and optimization problems, P and NP Classes, Polynomial time reduction, NP complete problems, significance of discovering NP complete problems, misconception about NP complete problems.

References:

Introduction to Automata Theory, Language & Computation by J.E. Hopcroft and J.D. Ullman, PEARSON Education 2nd Edition.

- Introduction to Language & Theory of computation, third edition, John C. Martin. MC Grow Hill.
- Theory of Computer Science, K.L.P. Mishra, PHI

P. G. Bose & R.

A. K. S. S. S.

D. K. S. S. S.

A. K. S. S. S.

18/5/2017

A. K. S. S. S.

Staff Council

18/5/17

MT-FT-25 (i) Information and Network Security

L/T	P	Credit	Int	Ext
4	-	4	30	70

Note:-Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

Unit-I

Computer Security Concepts, Introduction, What is Security, security trends,, Components of Information System, OSI security architecture, Security Attacks, Goals for Security , security mechanisms, Integrity policies and Hybrid policies.

Unit-II

Cryptography: Concepts and Techniques, symmetric and asymmetric key cryptography
Symmetric key Ciphers:Classical encryption techniques, Block cipher design principles, DES, Advanced encryption standard, AES structure, Analysis of AES, Block cipher operations, Principles of pseudorandom number generation and stream ciphers.
Asymmetric key Ciphers:Principles of public key cryptosystems, RSA algorithm, Analysis of RSA, Diffie-Hellman Key exchange.

Unit-III

Security services, Message confidentiality, message integrity, message authentication, key management, Message Authentication and Hash Functions:Authentication requirements and functions, MAC and Hash Functions, MAC Algorithms: Secure Hash Algorithm, Digital signatures, Key management and distribution, Intruders, Virus and Firewalls, Intruders, Intrusion detection, password management, Virus and related threats, Virus Countermeasures, Denial of service attacks, Firewall design principles, Types of firewalls.

Unit-IV

Security at layers(Network, Transport, Application),IPSec, Secure Socket Layer(SSL), Transport Layer Security(TLS), Secure Electronic Transaction(SET), Electronic Mail security: Pretty Good Privacy(PGP).S/MIME, Steganography & its application, watermarking & its application.

References:

- William Stallings, "Cryptography and Network Security: Principles and Practices", Third Edition, Pearson Education, 2006.
- Matt Bishop, Computer Security art and science, Second Edition, Pearson Education, 2002.
- Wade Trappe and Lawrence C. Washington, Introduction to Cryptography with Coding Theory 2e, Pearson Education, 2007.
- Jonathan Katz, and Yehuda Lindell, Introduction to Modern Cryptography, CRC Press, 2007.
- Douglas R. Stinson, Cryptography Theory and Practice, Third Edition, Chapman & Hall/CRC, 2006.

19805LR

[Handwritten signature]
Danech

[Handwritten signature]
18/5/2017

Staff Council

[Handwritten signature]

[Handwritten signature]

[Handwritten signature]
18/5/17

MT-FT-25 (ii) Soft Computing

L/T	P	Credit	Int	Ext
4	-	4	30	70

Note:-Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

UNIT - I

Basic concepts of neuro-computing: Artificial Neural Network (ANN) and their biological roots and motivations, Mathematical Models of Neurons, ANN architecture, Learning rules, Learning Paradigms Supervised, Unsupervised and reinforcement Learning, ANN training Algorithms- perceptions, Training rules, Delta, Back Propagation Algorithm, Multilayer Perceptron Model, Applications of Artificial Neural Networks, Competitive learning networks, Kohonenself organizing networks, Hebbian learning; Hopfield Networks, Associative Memories, The boltzman machine; Applications.

UNIT - II

Introduction to Fuzzy Logic: Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function. Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations. Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on Intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations. Fuzzy Logic: Classical Logic, Fuzzy Relations.

UNIT - III

Genetic Algorithm (GA): Evolutionary computing, conditions for evolution, Simple Genetic Algorithm (SGA), different types of operators: Selection, Crossover, mutation and replacement, optimization problems and traditional optimization methods, differences between GA & traditional methods, Holland's schemata theorem, encoding schemes.

UNIT - IV

Random Optimization, Swarm Intelligence, Natural Computing, Simulated Annealing, Tabu Search, Ant Colony Optimization, Particle Swarm Optimization, Memetic Algorithms.

References:

- S. N. Sivanandam & S. N. Deepa, Principles of Soft Computing, Wiley India Pvt. Ltd..
- Goldberg D. E., Genetic Algorithms in Search, Optimization, and Machine Learning, Pearson Education.
- Jang, Sun, Mizutani, Neuro-Fuzzy and Soft computing, Pearson Education.
- Haykin, Neural networks: A comprehensive foundation, Pearson Education.
- Mitchell M., An Introduction to Genetic Algorithms, Prentice-Hall.
- Klir G.J. & Yuan B., Fuzzy Sets & Fuzzy Logic, PHI.

P. G. Bose & R.

R. K. S. R.

D. K. S. R.

18/5/2017

Staff Council

18/5/17

MT-FT-25(iii) High Performance Networks

L/T	P	Credit	Int	Ext
4	-	4	30	70

Note:-Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

UNIT - I

History of Networking and Internet; Need for Speed and Quality of Service; Advanced TCP/IP and ATM Networks; Internet Services; Internet Architecture; Backbone Networks; High Performance Networks; TCP Services; TCP format and connection management; SCTP; Encapsulation in IP; UDP Services, Format and Encapsulation in IP; IP Services; Header format and addressing; Fragmentation and reassembly; classless and subnet address extensions; subnetting and supernetting; CIDR; IPv6

UNIT - II

Congestion Control and Quality of Service: Data traffic; Network performance; Effects of Congestion; Congestion Control; Congestion control in TCP and Frame Relay; Link-Level Flow and Error Control; TCP flow control; Quality of Service(QoS): Flow Characteristics, Flow Classes; Techniques to improve QoS; Traffic Engineering; Integrated Services; Differentiated Services; QoS in Frame Relay and ATM; Protocols for QoS Support: Resource Reservation- RSVP; Multiprotocol Label Switching; Real-Time Transport Protocol

UNIT - III

High Speed Networks: Frame Relay Networks; Asynchronous Transfer Mode (ATM); ATM Protocol Architecture; ATM logical connections; ATM cells; ATM Service categories; ATM Adaptation Layer; ATM Switching and Signaling; Optical Networks: SONET networks; SONET architecture; High-Speed LANs: Bridged and Switched Ethernet; Fast Ethernet; Gigabit Ethernet; Wireless LANs: IEEE 802.11, Bluetooth; Introduction to HIPERLAN; WIMAX; RFID, Sensor Networks; Vehicular Networks; Cellular Telephony; Generations; Cellular Technologies in different generations; GSM, CDMA; Satellite Networks

UNIT - IV

Internet Routing: Interior and Exterior gateway Routing Protocols; RIP; OSPF; BGP; IDRP; Multicasting; IGMP; MOSPF; DVMRP, ; Routing in Ad Hoc Networks; AODV, DSR; Routing in ATM: Private Network-Network Interface; Mobile IP and Wireless Application Protocol; Error and Control Messages: ICMP; Error reporting vs Error Correction; ICMP message format and Delivery; Types of messages; Address Resolution: ARP, BOOTP; DHCP; Network Management and SNMP;

Staff Council

[Handwritten signatures and dates]
A. B. S. R.
18/5/2017
18/5/17

References:

- Stallings W., "High-Speed Networks and Internets, Performance and Quality of Service", Pearson Education.
- B. Muthukumar, "Introduction to High Performance Networks", Vijay Nicole Imprints.
- James F. Kurose, Keith W. Ross, "Computer Networking, A Top-Down Approach Featuring the Internet", Pearson Education.
- Behrouz A. Forouzan, "Data Communications and Networking", McGraw Hill.
- Mahbub Hassan, Raj Jain, "High Performance TCP/IP Networking, Concepts, Issues, and Solutions", Pearson Education.
- William Stallings, "Wireless Communications & Networks", Pearson Education
- Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal, "Mobile Computing", TATA McGraw Hill.
- 6. Larry L. Peterson, Bruce S. Davie, "Computer Networks", Elsevier India.

Staff Council

Wahid
18/5/2017

PG Bosker

[Signature]

Ash

Daksh

Wahid

[Signature]

Ash

[Signature]
18/5/17