SINGHANIA UNIVERSITY
JHUNJHUNU (RAJASTAN)

SYLLABUS FOR M.TECH. COMPUTER SCIENCE

ORDINANCE –MASTER OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING.

(M.tech. Computer Science & Engg. Examination)

Semester system

Sr. no	Paper no.	Subject:
1	MT.100 CSE	Programming Fundamentals & Problem Solving Using C.
2	MT.101 CSE	Data Structures
3	MT 102 CSE	Computer Architecture.
4	MT 103 CSE	Linear Algebra and Discrete Mathematical Structure,
5	MT 104 CSE	Programming Language Principles & System.
6	MT 105 CSE	Software Lab-I Programming in C
7	MT 106 CSE	Software Lab-II Implementing Data Structure in C
8	MT 107 CSE	Seminar.

Second semester

9	MT 108CSE	Data base system and ORACLE
10	MT 109CSE	Operating system
11	MT 110CSE	Object Oriented Methodology
12	MT 111 CSE	Software Engineering
13	MT 112 .CSE	Data Communication & Network
14	MT 113 .CES	Software lab-I ORACLE
15	MT 114 .CSE	Software lab-IIC++
16	MT 115 .CSE	Seminar

Third semester

17	**MT 116. CSE**	**System simulation**
18	**MT 117. CSE**	**Visual Programmming**
19	**MT 118. CSE**	**Elective-I**
20	**MT 119. CSE**	**Elective-II**
21	**MT 120. CSE**	**Literature Survey for MT-CSE-4100)**
22	**MT 121. CSE**	**Software lab-I Shell Programming**
23	**MT 122. CSE**	**Software Lab-II Visual Programming**
24	**MT 123. CSE**	**Seminar**

List of elective papers

25	**MT 124.E. CSE**	**Micro Processor and Interface**
26	**MT 125. E.CSE**	**Computer Graphics and Multimedia.**
27	**MT 126.E. CSE**	**Computer system Reliability**
28	**MT 127. E.CSE**	**Compiler Design**
29	**MT 128.E. CSE**	**Artificial Intelligence and Expert system.**
30	**MT 129.E. CSE**	**Software quality models and testing.**

FORTH SEMESTER

31. MT 130 CSE Dissertation Presentation &viva-voce
Internet Assessment

MT.100.CSE

PROGRAMMING FUNDAMENTALS & PROBLE-SOLVING USINGC.

Algorithmic Development:-Techniques of problem solving, Flowcharting, decision table, Structured programming concept Modular Programming, Algorithms for searching, sorting and meging, Programming methodologies: top down and bottom up programming.

Elements of C:- C character set, identifiers and keywords, Data types: declaration and definition.

Operators:-Arithmetic, relational, logical, bitwise, unary assignment and conditional operators, their hierarchy and associativity.

Data input /out put

Control Statements:- Sequencing, selection, if and switch statement: altherantion, Repetition for while and do –while loop: break, continue,go to.

Function:-Definition, prototype, passing parameters recursion,

Data Structer:-

Array, struct, union string, data files.

Pointer:-Declaration, operations on pointers, array of pointers, pointers to arrays.

References:-

1. Jeri R, Hanly & Elliot P.KOffiman, Problem Solving and Program Design in C, 3rd Ed.Addison Wesley, 2000.
2. Al Kelley, ira Pohl, A Book on C, programming in C, 4th Ed. Addison, Wesley, 2000.
3. Yashwant Kanetker, Let us C, BPB Publications,
4. Gottfried Programming with C, Tata McGraw Hill.

MT –CSE-101

DATA STRUCTURES

The notation of data structures, primitive and composite data types, stacks, queues, arrays, linked lists, trees and graphs, algorithm for manipulating data structure binary trees and balancing trees, hash coding-symbol table.

Introduction to data structure, file, record and field vanous type of the organisation, auxiliary storage management directory, gain access to files, data validation, documentation, and its important algorithm development problem analysis, flow, chart, decision table searching sorting and merging internal and external.

C Programming language, Development & Implementation algorithms in C.

References :-

1. A.M Tanenbaum, Y Langlelam M.J Augustion ; Data structures Using C (Prentice Hall of India)

2. Alfred V. Aho, J.E Hoperoft ; Structures and Algorithms,(Addison Wesley 1983)

3. J.P. Trembly, P.G.Sorenson : An introduction to structure withaplications (McGraw Hill)

4. Sara Basse : Computer Algorithms introduction to design Analysis (Addison Wesley 1989)

5. E.Horowitz & Sahni. : Fundamentals of computer Algorithms (Galgotia Publ.)

6.G.M.Schneider, : An Introduction to Programming.

MT-CSE-102
COMPUTER ARCHITECTURE

Data Representation:-Number systems radix and radix minus one complement representation, fixed point and floating point representation, error detecting and correcting codes.
CPU Structure:- ALU, hardware algorithms for addition, subtraction, multiplication and division for fixed and floating point arithmetic operations, register transfer language,and micro operations.
Introduction sets,addressing modes and instruction , formats, processor, organization, instruction cycles, instruction pipelining RISCvs CISC, superscalar processors, micro programmed control unit.
Memory system:-Memory hierarchy, main memory, auxiliary memory, associative memory, cache memory, virtual, memory,
Input-out put organization:- I/O devices I/O interface asynchronous data transfer programmed I/O interrupt driven I/O priority interrupt, DMA, I/O channels and processors.
References:-

Mano, M. Morris : Computer system Architecture (Third Ed.)Prentice Hall of India, 1998.
Heuring V.P. : Computer System Design and Architecture, Addison Wesley, 2000.
Jordan, H.F.
Hayes, J.P. : Computer Architecture and Organization (Third Edition) Mc. Graw Hill, 1998.
Tanenbaum, A.S. : Structured Computer Organisation (Forth Edition) Prentice Hall of India, 1999.
Stallings, W. : Computer Organsistion and Architecture (Forth Edition) Prentice Hall of India 1999.

LINEARALGEBRA AND DISCRIETE MATHEMATICAL STRUCTURE
MT-CSE-103

Set theory, relations, equivalence, partial ordering functions, injection, bisection, definition and elementary properties of algebraic structures, mathematical reasoning, graph theory and its application in Computer Science.
Linear algebra and modern algebra, groups rings, fields, real and complex fields, victor spaces abstractly defined, linear, independence basic and subspaces, dimension of liner space determinants, matrices, characteristic equation and eigenvalues, canonic decomposition of matrices elementary decomposition, of matrices, direct method. For linear systems of equations, Gaussian elimination, implementatation including pivoting and scaling direct factorization methods.

References:-

1. Gilbert, S. : Liner Algebra & its Application 2nd ed.(Prentice Hall)
2. Smith ; Linear Algebra (Springer VerlaG.(Springer Verlag. 1976)
3. Deo. N. : Graph Theory with application to Engineering & Compute science (Prentice Hall, 1974)
4. Hia C.L. : Discrete Mathematics for computer Scinece (Mc.Graw Hill.1977)
5. Temblay, J.P & Manohar :Discrete Mathematical Structures with application to Engineering and Computer Science, (Mc.Graw hill, 1975)
6. Koman Bernard & Robert C, Busby : Discrete Mathematical Structures for computer Science (Prentice Hall)
7. Nicodemi, Olympia : Discrete Mathematics (CBS Publishers.)
8. Block, J, & Michaels, J.C.: Linear Algebra (McGraw Hill, New York 1977)
9. Jain M. K. Jain, R.K. : Numerical Methods for Scientific and Engineering Computatiions. (Wiley Eastern

Lyenger S.R.K.
Ltd, (1987)

MT-CSE-104
PROGRAMMING LANGUAGES PRINCIPLES AND STSTEM PROGRAMMING.

Preliminaries:- language paradigms. Language criteria, language design trade offs, influences on language desingn, bindings type checking, and copes, variables and data types Primitive data types, variables, structured data types.abstraction, data abstraction control abstraction. Procedural abstraction,
Formal language and Automata:- The Chomsky hierarchy of formal languages, regular expressions, finite automata. Context free grammars pushdown automata, ambiguous grammar pushdown automata, ambiguous grammars.
Imperative Programming:- Structured programming, procedure activations parameter Passing methods, scope rules, activation records;
Object-oriented Programming- messages methods and encapsulation, classes and polymorphism, inheritance and object orientation .
Language constructs for Parallel Processing:- the paradigm multiple processes. Synchronization of cooperating processes.
Introduction to system software:-Definition, components of system software and evolution of system software,
Assemblers;- Basic assembler function machine dependent and independent assembler features, design options.
Loader and Linkers :- Basic loader functions machine dependent and independent loader features, loader design options.
Compilers:- Basic compiler function scanning parsing, storage allocation, code optimization and generation.
Operating system:- Basic operating system function design options.
System Design :- Procedural system design and object oriented system desing.

References:-
Beck L. Leland, System software, 3rd ed. (Addison Wesley 2000)
Donovan J. Hohn system Programming. (Tata McGraw Hill)
Dhamdhere D.M. system Progrmming and Operating System (Tata McGraw Hill)
Sebsta W. Rober, Concepts of Programming Languages. 4th ed. (Addion Wesley- 2000).
Appleby Doris & Vande Kopple. J. Julius, Programming language Paradigm and Practice 2nd ed.(tata McGraw hill 1999)
Sethi Ravi Programming Languages, 2nd ed. (Addison Wesley-2000)

MT-CSE-109

DATA BASE SYSTEM AND ORACLE

Basic Concepts:-A historical perspective, file systems vs. DBMS characteristics of the data base approach, abstraction and data integration , database users, advantages and disadvantage of a DBMS implication of data base approach.

Data Base System Concepts and Architecture:- Data models schemas and instances, DBMS architecture and data Independence data base languages &interfaces DBMS function and components modules.

Entity Relationship Model:- Entity types, entity sets, attributes deys, relationships, relationship types, roles and structure constraints, weak entity types, E.R. Diagrams.

Relational data model :- Relational model concepts, Integrity constraints over relations Relation Algebra basic operations.

SQL:- Data definition, constraints, & schema changes in sql insert delete & update statements in SQL view in SQL specifying constraints and indexes in SQL Queries in SQL.

A Relational database management system:- ORACLE a historical perspective, basic structure, data base structure and its manipulation in Oracle, Storage Organisation in ORACLE Programming, ORACLE application.

Conventional data Models:-An overview of network and Hierachical and Data Models.

Relational Data Base design:- Functional dependencies normal forms based on primary leys (1NF,2NF,3NF).

Practical Data base Design:-role of information systems in organization database design process, physical database design, in relational database.

Transaction Processing Concepts:- Introduction to transaction processing, transaction & system concepts, properties of Transaction, Schedules and recoverability, serailizability, of schedules.

Concurrency Control Techniques:- Locking Techniques. Time stamp ordering Multiversion techniques. Optimistic techniques. Granularity of data items.

Recovery Techniques:-Recovery concepts recovery techniques in centralized DBMS.

Data Base Security:- Introduction to database security issues .

Distributed data Bases:- Distributed database concepts, an overview of Client server Architecture.

An overview of object oriented database and temporal databases .

References:-

1. Elmasri & Navathe : Fundamentals of database systems, third editions Addison Wesley new delhi.
2. C.J. data : An introduction to databases systems. 7th edition, Addison Wesley, new delhi,
3. Raghu ramakrishan & Johannes Gehrke database management systems IInd edition, Mcgraw hill International Editions.
4. Bipin C. Desai: An introduction to database system Galgotia Publication, New Delhi,
5. Korth & Silberschatz : Database system concept, IInd edition McGraw Hill Publishing Company. Ltd.
6. Abbey, Abramson & Corey: Oracle 8i-A Beginners's Guide, Tata McGraw hill Publishing Company Ltd.
7. Ivan Bayross :80L PC/SQL the program language of ORACLE. BPB Publication New Delhi.

MT-CSE-110

OPERATING SYSTEMS

Introduction:- Operating system classifications, simple monitor. Multiprogramming, time sharing, real tiem systems, Multiprocessor, Networking & Distributed systems, Interrupt based systems, operating systems services, system calls, system programs, system generation,

File system:- File support access methods, allocations methods. Contiguous linked and indexed allocation. Directory system single level, tree structures acyclic graph and general graph directories, file protection.

Device scheduling:-Physical Characteristics, Disk scheduling algorithms :FCFS, SSTF, SCAN, C-SCAN, LOOK, C, LOOK: sector queuing algorithms for scheduling fixed head devices.

CPU Scheduling:-Basic scheduling concepts, process overviews, process states, suspend/resume operations, multitasking and multithreading, schedulers and scheduling algorithms, multiple processor, scheduling.

Inter-process Communications:-the producer consumer problems, interrupt disanling/Enabling lock flag, primitives o Mutul exclusion, Peterson' algorithms, semaphores.

Memory management:-Bare machine approach, mResident monitor, Partition, Paging and Segmentation, virtual memory overlays, grand paging, performance, of demand paging, replacement, algorithms, m-thrashing.

Deadlocks:- Deadlock characterization deadlock prevention, avoidance, detactionand recovery.

Resource Protection:-Mechanism policies and domain of protection links access matrix and its implementation, dynamic protection structures.

Resource Protection:- Mechanism policies and domain of protections, access matrix and its implementation dynamic protection structure.

Case study of UNIX OPERATING SYSTEM:- Command system Processes in UNIX memory management system I/O system. File system and allocation method.

References:-

1. Siberschatz, A and Galvin P.B. Operatingsystem concepts Addison Wesley, England -1998.
2. Deitel H. M. An introduction to operatingsystem Addison Wesley England -1990.
3. Stallings William Operating system" PHI, New Delhi, 1997.
4. Madnick & Donavon: Operating System"Mc.graw Hill International editions, computer science, New york. 1996.
5. Kernighan B. W. and Pike Rob. : The unix programming environment, PHI, New Delhi, 1991.

MT-CSE-111
OBJECT ORIENTED METHODOLOGY.

Software crisis, object oriented programming, paradigm, object model classis and object encapsulations and information hiding data abstraction, responsibility collaborations and message passing, links and associations, generalization, and inheritance, aggregation, abstract classes, multiple inheritance, container classes. Meta classes.

Object oriented design Methodology domain analysis, stratic models, dynamic models, concurrency models, functional models, the OMT methodology analysis, design.

Object- oriented features in C++ : Objects and classes. Structs vs classes inheritance, aggregation, constructors destructors operator overloading and function overloading, polymorphism exception handling, templates.

References:-

Rumbaugh J. et al. : Object oriented modeling and Design Prentice hall of India,1998.

Stroustrup, B. : The C++ Programming Language Addison wesley1993.

Nielosn,K. : Object orienteddevelopment with C++ A software engineering Approach, Galgotia1998.

Lippman : C++ Primer, 3/e, Addison Wesley.

Balaguruswami,E. : Object-orinetedProgramming in C++ tata Mcgraw Hill, 1998.

Schildt, Herbert : C++ : The complete Reference, 2/e tata,McGraw Hill. 1998.

MT-CSE-112
SOFTWARE ENGINEERING.

Software and software Engineering- Software characteristics. Software crisis, software engineering paradigms.

Planning a software Project:- Software cost estimation, project scheduling, personnel planning, team, structure,

Software configuration management, quality assurance project monitoring, risk management.

Software requirement Analysis- Structured analysis, object-oriented analysis and data modeling software requirement specification validation.

Design and implementation of software:- Software design fundamentals, design methodology, (structured design and object oriented design) design verification, monitoring and control coding.

Software reliability:- Metric and specification, fault avoidance and tolerance, exception, handling, defensive programming.

Testing:-Testing fundamentals, white box and black box testing software testing strategies: unit testing, integration testing, validation testing system testing, debugging.

Software Maintenance- Maintenance characteristics maintainability, maintenance tasks, maintenance side effects.

CASH tools.

References:-

1. Pressman S. Roger software engineering, tata McGrawHill.
2. Jalote, Pankaj, An integrated Approach to software Engineering Narosa Publishing House.
3. Sommerville lan, Software engineering, 5th ed. AddisonWesley 2000.
4. Fairley Richard, Software Engineering Concepts, Tata Mc.Graw Hill.

MT-CSE-113
DATA COMMUNICATIONS AND NETWORK

Network concepts:- Goals and application of Computer Network Distributed Processing, Topologies. Categories of Networks –LAN, MAN, WAN, Internet works point to point and multipoint configuration, broadcast networks Introduction to SMDS, X. 25 networks, ISDN frame relay and ATM networks.
Network Architecture:-Concept of protocols and services OSI models and functions of its layers TCP/IP reference model.
Data communication concepts:- Components of a data communication system transmission models, transmission media guided and wireless media, introduction to switching (circuit, message and packet) and Multiplexing 9frequencydivision and time division) concept of Modems.
Framing and error control:- Framing techniques, error control –error detection & correction.
Data link control:- Acknowledgments elementary data link protocols, automatic repeat request sliding window, protocols.
Medium access control and LANs:- Multiple access protocols of MAC aublayer- ALOHA, I persistent and p persistent CSMA, CSMA/CD, Collision free protocols, limited contention protocols. Wavelength division multiple access, MACA, GSM, CDPD, CDMA, IEEE Standard 802,X for LAN'S and MANs Ethernet token bus, token ring, DQDB, FDDI.
Routing:- Deterministic and adaptive routing centralized and distributed routing shortest path, folding flow based optimal distance vector link state hierarchical routing for mobile hosts broadcast and multicast routing.
Congestion control:- principles of congestion control, traffic shaping choke packets load shedding.
TCP/IP:- TCP/IP and Internet transmission control protocol user datagram protocol internet protocol.
Application layer:- Network security –cryptography and authentication simple network management protocols.
References:-

1. Computer Networks –Andrew S. Tanenbaum, PHI.
2. Data communications, computer networks and open systems fourth edition fred Halsall, ADDISON Wesley..
3. Introduction to data communications and Networking Behrouz foruzan tata McGraw Hill.
4. Data and computer communication fifth edition William staging.

MT-CSE-116
SYSTEM SIMULATION

Introduction:- System concepts, system boundaries and environment, continuous and discrete systems, system modeling, type of Models , Modeling Methodology model validation Principles & Nature of Computer modeling and simulation.

Continuous & Discrete:- Analog vs digital simulation, continuous simulation vs Numerical Integration concepts of simulation of continuous and discrete system with the help of live examples generation of random numbers , generation of non, uniformly distributed random numbers, generation of poisson and erlang variates.

Simulators for the live systems:- Simulation of a water reservoir system, simulation of a hypothetical computer simulation of queuing systems basic concepts of queuing theory, simulation, of single server, two server and general queuing systems simulation in Inventory control systems elements of Inventory theory inventory models. Simulators, for complex inventory system.

Design and Evaluation of simulation Experiments:- Length of simulation, run variance reduction techniques, experiment layout and validation,

Simulation language:- continuous and discrete simulation languages, block structured continuous simulation languages, expression based languages discrete system simulation languages GPSS, SIMSCRIPT, SIMULA ,factors in selection of discrete system simulation.

Reference:-

1. **G**ordon G. System Prentice Hall of India Pvt. Ltd. New Delhi1993.
2. Narsing Deo : system simulation with digital computer PHI, new Delhi, 1993.
3. Neelamkavil frances : "Computer simulation and modeling, John Wiley & Sons New York. 1987.
4. Payne James A : "Introduction to simulation : Programming techniques and methods of Analysis, McGraw Hill International editions, computer science services new york1998.
5. Reitmann Juian: "computer simulation Experiments wiley interscience, 1971.

MT-CSE-117
VISUAL PROGRAMMING

The VB integraed development Environment and its elements :- Menu bar, tool bar, project explorer tool box propertices windows form designer form layout etc,

The VB language and its Elements:- Variables, constants arrays, collections, subroutines, function arguments and control structures.

Designing a VB application,:- Working with VB forms form properties, adding, deleting, and managing forms at run time, coding event procedures, implementing drag and drop operation menu, designing, adding menu interface to forms attaching code to events dynamic menu appearance.

Coding a VB Application:- implementing user interface controls, common controls and their propertie4s, dynamic controls custom control , control arrays, using variable, subroutines, function and control structures, accessing data through code and data controls using DLLs in VB application building active clients active X servers actives X controls, activeX documents and web enabled application.

Database programming and object oriented rogramming with VB.

Reference:-

1. Visual basic 6 by Howard Hawee, PHI.
2. Teach yourself visual basic by warner, TMH.
3. Mastering VB. 6 by Evangelos petroutosos.TMH.
4. Programming in VB -6 by Bradley, TMH.
5. VB-6 the complete reference by Jerke, TMH.

MT-CSE.E.-124
MICROPROCESSOR AND INTERFACES

Introduction to Microprocessor and Microcomputer:- Histories background mk modern microprocessors and microcomputers , architecture of Pentium processor, real and protected modes of operations, addressing modes and instruction set of Pentium processor. Concept of RISE and CISC microprocessors.
Memory Intrface:- Memory devices, address decoding 8/16/32/64- bit memory Intrfaces.
Input –out put interfaces:-Introduction to I/O interfaces, I/O mapped I/O and momory mapped I/O basic output interface, I/O port address decoding,. 8/16/32-bit wide I/O ports 82C55 PPI.
Interrupt structure:- Basic interrupt processing, interrupt instructions of Pentium, operations of real and protected mode interrupt 8259 PIC and its programming, expanding interrupt structure by cascading 8259's.
Direct Memory Access:- DMA daa transfer and basic DMA operations, 8237 DMA controller, its programming.
Bus Interface:- The 8/16 bit ISA bus and its interfacing with input& output Ports EISE 32-bit bus and its interfacing, VESA and VL busses. PCI and PCMCIA busses.
Reference:-

1. the intel mocroprocessors : Achitecure programming and interface by berry B. Brey (PHI).
2. Microcomputer systems. Architecture, programming and design by Liu and Gibso (PHI).
3. Microprocessors by D.V. Hall.

MT-CSE.E.-125
COMPUTER GRAPHICS AND MULTIMEDIA.

Introduction : Survey of Computer Graphics and its applications; Interactive and passive graphics; introduction to GKS primitives; display processors;

Graphic Devices :- Display systems-refresh CRTs, raster scan and random scan monitors, Grey shades, interlacing, beam penetration shadow mask monitors, look up tables, plasma panel, LED and LCD monitors, VGA and SVGA resolutions; hard copy Devices-printers, plotters; Interactive input Devices- mouse, digitizing tablet, light pen, touch panels, image scanners, voice systems, joy stick, track ball.

Drawing Geometry:- Coordinate system; resolution; use of homogeneous coordinate system scan conversion : symmetrical DDA, simple DDA, Bresenhams line drawing algorithm, generation of ellipse.

2-D Transformations:- Translation; rotation; scaling; mirror reflection; shearing zooming; panning; input techniques- pointing, positioning, rubber band methods and dragging; tweening.

Graphic Operations:- Clipping-line clipping using Sutherland-Cohen and midpoint sub-division algorithm, polygon clipping; window and viewport; windowing transformation; Filling-stack based fill algorithm, scan-line seed fill algorithm.

3-D Graphics :- 3D modeling of objects; 3D display techniques; coordinate system; 3D transformation matric for translation, scaling and rotation parallel projection perspective projection Hidden surface removal Z- Buffer back face, scan line, depth sorting area subdivision ; shading modeling light intensities. Goung shading, phong shading.
Multimedia:- Concept of Hypertext /Hypermedia multimedia application multimedia authoring multimedia hardware images bitmaps windows paint brush.
References:-

1. computer graphics : Donald Hearn, M.Pauline Baker, PHI.
2. Principles of Interactive computer graphics : Neqman & Sproull, Mcgraw Hill.
3. Multimedia system ; John, F. Koegel Buford, Addison Wesley.
4. computer graphics : Foley etc. Addison Wesley. principles & practice.
5. Procedural elements of computer graphics :Rogers, McGraw Hill.
6. Fundamentals of Computer Graphics and Multimedia.: D.P. Mukherjee. PHI.

MT-CSE.E.-126
COMPUTER SYSTEM RELIABILITY

Basic definition in Reliability, types of failure bath tub curve, exponential law of reliability.
Series, Parallel K –ouf-of-N structure non series parallel systems reliability analysis in such systems.
Types of Redundancy , Active parallel and standby redundancy, redundancy in digital circuits, TMR, Multiplexed TMR, NMR.
Concept of repair and maintenance concept of availability and its relation with reliability and maintainability, preventive maintenance.
Concept of software reliability, notion of errors, classification of errors, software structures, verification of software, test methods test plans debugging aids.
Automatic error detection ad error correction.
Software maintenance. The management of reliable software.

Reference :-

1. L.S. Shrinath ; Concept of Reliability.
2. H. Kopetz : Software reliability.
3. Aggrawal. K.K.: Reliability Engineering, Kluwer academic publishers, London.
4. C.R.Vick & C.V.rammnoorthy: Handbook of software engineering, CBS publishers & Distributors, Delhi.

MT-CSE.E-127
COMPILER SESIGN

Introduction to compiling :- Compilers and phases of compilation, analysis synthesis model of translation, compiler construction tools.

Lexical Analysis:- Process of Lexical analysis finite state sutomata, DGA and NFA recognition of regular expressions, LEX.

Syntax Analysis:- process of syntax analysis, types of grammar, top down and bottom up parsing techniques, parser generator.

Intermediate code generation:- Intermediate languages. Generating intermediate code for declarative statement assignment statement, Boolean expression and case statement.

Code optimization :- Introduction to code optimization, potential asess code optimization, optimization of basic blocks, loop in flow graphs, code improving transformation.

Code Generation:- Issues in the design of a code generato4, the target machine dynamic storage management, translating basic blocks a simple code generator peephole optimization directed acyclic graphs and basic blocks, code generation from directed acyclic graphs.

Overview of syntx directed translation scheme, type checking, type conversion, function and operator overloading, parameter passing.

References:-

1. Compilers : Principles, techniques & Tools by Aho. Ullman & Sethi (Addison Wesley).
2. Principles of compiler design design by Aho. & Ullman (Narosa Publication)
3.]Practice & Principles of compiler Building with C b Henk alblas et al. (PHI).
4. Principles of compiler design by Trembley & Sorenson (McGraw Hill).

MT-CSE.E-128

ARTIFICAL INTELLIGENCE AND EXPERT SYSTEMS.

AL Historical foundation, the Turing test overview of AI placation area.
Problem representation sate space representation of problems. Problem reduction representation.
Knowledge representation: Logical representation schemes.
Propositional and Predicate Calculus, syntax and semantic, interface rules unification and resolution procedural representation scheme production system definition, different types of production syntax Network representation schemes: Semantic networks conceptual graphic conceptual dependencies, structured representation schemes scrip frames and objects.
Strategies for state space search: Data driven and goal driven searing uninformed search depth 1st searching iterative deepening heuristic search: admissibility, monotonicity informed ness, heuristics in games, control of search.
Expert systems. Overview of expert system technology, express system architecture managing and representing uncertainty in exp system MYCIN a case study, MYCIN's knowledge base MYCIN control structure, knowledge acquisition designing for explanation, tools for building expert systems.
Truth maintenance systems.
Al programming in PROLOG.

References:-

1. George F. Luger William A. Stubblefied. Artificial intelligence Benjamin / Cummings publishing Company.
2. Dan W. Patterson Introduction to artificial intelligence and expert system, PHI.
3. Eugene Charniak, drew McDermott : introduction to ratification Intelligence Addison Wesley.2000.
4. Nils, J. Nilsson : Principle of Artificial intelligence Narosa Publishing house.
5. Jackson peter : Introduction to expert systems 3rd ed. (Addison Wesley 2000.)

MT-CSE-E.129

SOFTWARE QUALITY MODELS AND TESTING

Software Quality:- Meaning and scope software quality factors software quality metrics, relationship between quality factors and quality metrics, quality management system. software reviews, formal technical . Reviews, correctness proof, statistical quality assurance, clean room, software engineering, ISO 9001 and SEI-CMM standards of software.

Software reliability:-Meaning and its relation with software quality, reliability modeling exponential failure time models (vix. Jelinski Moranda model) Schnediwind's model, Musa's basic execution time midel hyperexpoential model. Weibull model and S-shaped reliability growth model and infinite failure category models (viz Duane's model, geometric model. Musa okumto model.

Software testing:-

Meaning scope and its relationship with software quality software testing techniques white box testing, basic path testing, control structure testing and black box testing etc. software testing strategies unit testing, integration testing, validation testing and system testing etc.

Reference:-

1. Software quality : concepts and Plan y Robert H Dunn, Prentice Hall international
2. Software reliability : Measurement predication and applicaios by John D Musam mc GrawHill.
3. Software reliability engineering by Michele R Lyu, Mcgraw hill.
4. Effective Methods of software testing by William E. Perry. Wiley
5. concepts of reliability y L. Srinath.
6. Software reliability y K.K. Aggarwal.
7. Software reliability byH. Kopetz.