

4th Semester

MCA - 651 COMPUTER ORIENTED OPTIMISATION MODELS

UNIT – I

Linear Programming, Mathematical Model, Assumptions of Linear Programming, simplex Method, Degeneracy, Applications, Duality, Dual Simplex Method, & Algorithm Assignment Problem. Hungarian Method & its Algorithm.

UNIT – II

Transportation Problem, Integer Programming :- Gomorra's method, Branch and Bound techniques. Integer Programming Algorithm.

Dynamic Programming:- Bellman's Principle of optimality, Dynamic Programming Approach, optimal subdivision problem, Decomposition, Applications in linear programming. DPP Algorithms.

UNIT – III

Queuing Theory : Queuing problem and system, Transient and steady state distributions in queuing system, Poisson process, Exponential process, classification of queuing models, Model I (M/M/1) : (∞ /FCFS), Model -II General Erlang Queuing model, Model - III (M/M/1) : (N/FCFS), Model - IV (M/M/S) : (∞ /FCFS). Algorithms.

UNIT – IV

Inventory Theory :- Basic concepts, classification of Inventory systems & models, Economic order quantity, Deterministic Inventory models :- EoQ Models without shortages, EoQ Models with shortages, Probabilistic Inventory Models with instantaneous demand, no set up cost model, Discrete and continuous cases.

UNIT – V

Games Theory : solution of games with saddle points, Minimax-Maxmin principle for Mixed strategy games, Dominance, to reduce size of game, Graphical method, solution of (mxn) game by simplex method & Algorithms.

Job sequencing : Processing n jobs through 2 machines, Processing n jobs through 3 machines & Algorithms.

PERT – CPM: introduction, applications, network diagram representation, Determination of the critical path, updating.

Computer Programming in Lab. :

Practical & Viva : To write computer programs of various optimization techniques in any programming language learnt in MCA course.

TEXT BOOKS :

- 1) S.D. Sharma Operations Research, Kedarnath Ramnath & Co. Meerut

- 2) P.K.Gupta & D.S.Hira Operations Research, S.Chand & Co.
- 3) Kantiswaroop Operations Research, S.Chand & Sons.
- 4) Gillet, B.E. Introduction to operations Research - A Computer Algorithm Approach, McGraw Hill.
- 5) Introduction to operations Research, 7/e by Hillier. TMH.

MCA - 652 SOFTWARE ENGINEERING - II

UNIT- I

Design Concepts and Principles- Software design and engineering, design process, principles, concepts. Effective modular design.

Design Methods- Data design, architectural design & process, transform mapping. Design steps, transaction mapping, interface design and guide lines.

UNIT- II

Software Testing Methods- Fundamentals, Test case design, white box testing, basic path testing, control testing, black-box testing. Testing strategies-strategic approach, criteria for completion testing, unit testing, validation testing, system testing.

UNIT-III

Software quality- McCall's quality factor, FURPS, Framework for software matrices.

Object-Oriented software engineering- Management of Object-oriented software projects. Object-oriented analysis, domain analysis, object-oriented design- issues, landscape, system design process, task data and resource management.

UNIT-IV

Object-oriented testing- Testing OOA and OOD models, unit and integration testing. Software Reuse-management issues, reuse process, domain engineering building reusable components, economics of reuse.

UNIT-V

Business process reengineering, s/w reengineering, reverse engineering forward engineering.

Client/Server Software Engineering- Structure of Client/Sever systems, s/w engineering for c/s systems, Analysis & design issues. Introduction to Case, building blocks and taxonomy.

Text & Reference Books

- 1) R. Pressman- Software Engineering- A Practitioner's Approach Mc GrawHill Intern.
- 2) Soumerville- Software Engineering, PHI
- 3) P. Jalote- Software Engineering, Narosa.
- 4) A Leon & M Leon- Fundamentals of s/w engineering, Vikas.

MCA - 653 COMPILER DESIGN

UNIT – I

Introduction to Compiling: Compiling & Translator analysis of source Program, Phases of Compiler, introduction to preprocessor, assembles, loader and linkers, book-keeping, error-handling, bootstrapping,

One Pass Compiler Syntax definition, Syntax-directed translation, parsing, translator for simple expressions, lexical analysis, incorporating a symbol, table, abstract stack machines, Putting the techniques together.

UNIT – II

Lexical analysis Role of the lexical analyzer, input buffering, specification of tokens, recognitions of tokens, language for specifying lexical analyzers, designing a lexical analyzer generator,

Syntax Analysis Role of Parser, Context free grammar, writing a grammar, top-down and bottom up parsing, operator precedence parsing, LR-Parsers, parser generator.

UNIT – III

Syntax Directed Translation Syntax directed definition, construction of syntax tree bottom up and for down translations, recursive evaluator, type systems specification of simple type checker, Symbol table & Structure of Symbol tables.

UNIT – IV

Run Time Environments Source language issues, storage organization storage allocation strategies error detection & recovery,

Intermediate Code Generation Intermediate languages, Declarations Assignment Statements.

UNIT – V

Code Generation Issues in design of code generator target machine run-time storage management, basic block and flow graphs, Code Optimization Introduction, Principal sources of code optimization optimization of basic blocks.

TEXT BOOKS

Aho & Ulman - COMPILER DESIGN

REFERENCE BOOKS:

- 1) Art of Compiler Design : The Theory & Practice by Tomas P:� men, Peter & Peters, Prentice Hall.
- 2) Compiler Design by Renhord Wilhelum Dieter Mauerl.
- 3) Compiler Design in Addison - Wesley Rib by Holub

UNIT – I

Introduction to Unix operating system, system structure and operating system services, Buffer cache: buffer headers, structure of the buffer port, scenarios for the retrieval of a buffer, reading and writing disk blocks. Advantage and disadvantage of the buffer cache. Internal representation of the files: I nodes, structure of a regular file, directories, conversion of a path name to an i-node, super block, i-node assignment to a new file, allocation of disk block.

UNIT - II

System calls for the file system: Open, read, write, file and record locking, lseek, close, file creation, creation of special files, change directory and change root, change owner and change mode, STAT AND FSTA, pipes, dup, mounting and unmounting file systems link, unlink, file system abstractions, file system maintenance.

UNIT – III

Structure of processes: Process states and transitions, layout of system memory, the context of a process, saving the context of a process, manipulation of the process address space, sleep; Process control: process creation, process termination, signals shell system boot and init process.

UNIT – IV

Process scheduling and System call for Time, Memory management policies and I/O subsystem and I/O related concepts in UNIX

UNIT – V

Interposes communication available facilities in UNIX, Multiprocessor systems, (Semaphore, messages etc.) Introduction to distributed UNIX system.

TEXT BOOK

1. Design of UNIX Operating System By Maurice J. Back

REFERENCE BOOK

- 1) UNIX Utilities by Tare
- 2) UNIX Operating System by Subhajit Das

MCA - 655 WINDOWS PROGRAMING AND VISUAL C++

UNIT – I

Introduction to Windows Program. Message processing in Windows Programming. Message boxes, Menu and Accelerators. Dialog Box. Creating Icons, Cursor and Bitmaps.

UNIT – II

Introduction to Child Window Controls. Check boxes, Static control, Radio Buttons, Scroll bars, Advance Window Controls : Toolbars up down controls, Spin control, Progress bar, Tree view, Tab controls, Text and Font.

UNIT – III

Working with Graphics, Consoles, Multitasking Process and Threads. Clipboard Drag and Drops, Advance features of Windows Programming GDI Metafiles, Sound API, DLL.

UNIT – IV

Visual C++ Basic: Introduction, Building a Basic Application, SDI and MDI, View Document Architecture Using Microsoft Foundation Class (MFC) Library, Visual C++ resources: Application Wizard, Accelerators and Menus, Toolbars.

UNIT – V

Visual C++ And Database Management: MFC programming without View Document Architecture,. Data Access Objects (DAO) versus Open Database Connectivity (ODBC), Database Building Overview, Building a Database Application using ODBC, Building a Database Application Using

Text & Reference Books

- 1) Windows Programming , by Charles Petzold, Microsoft process.
- 2) Windows Programming, by Herbett Schildts .
- 3) VC++, by Murray, TMH.
- 4) Introduction to VC++, by Steve Holzner.

MCA-691 SOFTWARE ENGINEERING

Viva-Voce shall be conducted on Software Engineering. Assignment shall include small design problems.

MCA-692 COMPILER DESIGN

Viva-Voce shall be conducted on Compiler Design. Exposure to Lex and yacc tools shall be given.

MCA-693 PROGRAMMING LAB IN VC++

Students are required to do assignments on Windows programming and Visual C++ along with a small project.