AFFILIATED INSTITUTIONS
ANNA UNIVERSITY, CHENNAI
REGULATIONS - 2009
CURRICULUM
M.TECH. MAIN FRAME TECHNOLOGY

SEMESTER – I

COURSE CODE NO	COURSE TITLE	L	T	P	C
THEORY					
MA 9327	Optimization Techniques	3	1	0	4
MT 9311	Fundamentals of Mainframe Technology	3	0	0	3
MT 9312	Data Structures and Algorithms	3	0	0	3
MT 9313	Computer Communication Networks	3	0	0	3
MT 9314	COBOL Programming	3	1	0	4
MT 9315	Advanced Database Technology	3	1	0	4
PRACTICALS					
MT 9316	Data Structures Lab	0	0	3	2

MA 9327   **OPTIMIZATION TECHNIQUES**   **L T P C**
                                                            3 1 0 4

UNIT I   LINEAR PROGRAMMING   (12)

Linear Programming: Graphical method, Simplex method, Revised simplex method, Duality in Linear Programming (LP), Sensitivity analysis, other algorithms for solving problems, Transportation, assignment and other applications.

UNIT II   NON LINEAR PROGRAMMING   (12)

Non Linear Programming: Unconstrained optimization techniques, Direct search methods, Descent methods, constrained optimization.

UNIT III   INTEGER PROGRAMMING   (12)

Formulation of Integer Programming problems, Gomory's cutting plane methods, Branch and Bound Techniques.

UNIT IV   DYNAMIC PROGRAMMING   (12)

Characteristics of Dynamic Programming, Bellman's principle of optimality, Concepts of dynamic programming, tabular method of solution, Calculus method of solution.

UNIT V   PERT/CPM   (12)

Network Construction-computation of earliest start time, latest start time, Total, free and independent float time-Crashing-Computation of optimistic, most likely Pessimistic and expected time-Resource analysis in Network scheduling.

L – 45 T – 15 Total – 60

REFERENCES:

1. Taha, H.A., "Operations Research: An Introduction", Pearson Education, New Delhi, 2002.
2. S.S. Rao, "Engineering Optimization: Theory and practice", New Age International, New Delhi, 2000.
3. Trivedi K.S., "Probability and Statistics with Reliability , Queuing and Computer Applications", Prentice Hall, New Delhi, 2003.

MT 9311   **FUNDAMENTALS OF MAINFRAME TECHNOLOGY**   **L T P C**
                                                                  3 0 0 3

UNIT I   NEW MAINFRAME   (9)

Mainframe concepts-an evolving architecture- mainframe computer users- factors contributing to mainframe use – mainframe workloads.

UNIT II   CAPACITY   (9)

Capacity – elements of a system required for capacity – few server Vs Many server – service level agreement – managing the system to the SLA – architecture, running work and capacity – several servers on one physical machine – parallel sysplex and its measurements.

UNIT III   SCALABILITY, INTEGRITY AND SECURITY   (9)

Introduction to scalability – scalability concepts – scalability implementation on IBM system – integrity – security – introduction to availability – Inhibitors to availability - redundancy – z/OS elements for availability – Disaster recovery.

UNIT IV   ACCESSING LARGE AMOUNT OF DATA   (9)

Introduction – channel subsystem – control unit- DASD CKD architecture and DASD subsystem – multiple allegiance/Parallel Access volumes – database and data sharing – Data placement and management .

UNIT V   SYSTEM MANAGEMENT AND AUTONOMIC COMPUTING   (9)

Introduction – system data – configuration management – operating management – performance management – problem management – introduction to autonomic computing – self healing – self protecting – self optimizing.

L – 45   Total – 45

REFERENCES:

1. Mike Ebbers,Frank Byrne, Pilar Gonzalez Adrados,Rodney Martin and Jon Veilleux "Redbook – Introduction to Mainframe - Large Scale Commercial Computing". First Edition December 2006, IBM Corp.
2. Lydia Parziale, Edi Lopes Alves, Klaus Egeler, Clive Jordan" Introduction to the New Mainframe: z/VM Basics", November 26, 2007, IBM Redbooks.

MT 9312   DATA STRUCTURES AND ALGORITHMS   L T P C
3 0 0 3

UNIT I   INTRODUCTION   (8)

Basic concepts of OOPs – Templates – Fundamentals of Analysis of Algorithm Efficiency – ADT - List (Singly, Doubly and Circular) Implementation - Array, Pointer

UNIT II   BASIC DATA STRUCTURES   (9)

Stacks and Queues – ADT, Implementation and Applications - Trees – General, Binary, Binary Search, Expression Search, AVL, Splay, B-Trees – Implementations - Tree Traversals

UNIT III   ADVANCED DATA STRUCTURES   (10)
Set – Implementation – Basic operations on set – Priority Queue – Implementation -
Graphs – Directed Graphs – Shortest Path Problem - Undirected Graph - Spanning
Trees – Graph Traversals

UNIT IV   SEARCHING AND SORTING   (9)
Searching Techniques, Sorting – Internal Sorting – Bubble Sort, Insertion Sort, Quick
Sort, Heap Sort, Bin Sort, Radix Sort – External Sorting – Merge Sort, Multi-way Merge
Sort, Polyphase Sorting

UNIT V   ALGORITHM DESIGN TECHNIQUES   (9)
Design Techniques - Divide and Conquer - Dynamic Programming - Greedy Algorithm –
Backtracking - Local Search Algorithms

                                                    L – 45   Total – 45

REFERENCES:
1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Pearson
    Education, 2002.
2. A. Levitin, "Introduction to The Design and Analysis of Algorithms ", 2nd edition,
    Addison Wesley, 2007 (chapter 2)
3. Horowitz, Sahni, Rajasekaran, "Computer Algorithms", Galgotia, 2000
4. Tanenbaum A.S., Langram Y, Augestien M.J., "Data Structures using C & C++",
    Prentice Hall of India, 2002
5. Aho, Hopcroft, Ullman, "Data Structures and Algorithms", Pearson Education, 2002.

MT 9313   COMPUTER COMMUNICATION NETWORKS   L T P C
                                                        3 0 0 3

UNIT I   INTRODUCTION: (9)
Networking basics - LANs and WANs - Network hardware components, Server-based
networks - Peer-to-peer networks - Server-based vs. peer-to-peer networks -
Specialized servers - Combination networks - Network packets – Addressing packets –
Multiplexing - Protocols - The OSI reference model – Internet Protocol Stack

UNIT II   DATA LINK CONTROL: (9)
Asynchronous and Synchronous transmission - MAC protocol; Controlled & contention-
based - IEEE 802.11 LANs – IEEE 802.11a,802.11g - System architecture, protocol
architecture– physical layer, Media Access Control – MAC management – Data
Transmission Module wrap-up LAN architecture - Error Detection and Correction
Techniques – CRC and Linear Block Codes – Transmission Protocols – Retransmission
techniques -Token ring – FDDI

UNIT III　　　**NETWORK PROTOCOLS**:　　　　　　　　　　　**(9)**
IP Layers and functions - Congestion control - X.25 - Internetworking concepts and X.25 architectural models – Naming addressing and routing using IP - Unreliable connectionless delivery - Datagram's - Routing IP datagram's - ICMP.

UNIT IV　　　**INTERNETWORKING:**　　　　　　　　　　　　**(9)**
LAN Addresses and ARP - Bridges, and Switches – Hubs – Routers – Brouters – gateways and Repeaters - Choice for Implementation - File Transfer: FTP - Electronic Mail in the Internet - DNS - Socket Programming with UDP -Building a Simple Web Server

UNIT V　　　**NETWORK MANAGEMENT:**　　　　　　　　　　**(9)**
　　The dial-in end-user - the direct connection user - the Internet Service Provider - the global Internet - emerging technologies over the Internet: IPv6 and ATM for a multimedia network - desktop conferencing and collaboration - mobile Internet - high-quality audio - Push Technologies

L – 45 Total – 45

REFERENCES:

1. Fitzgerald and Dennis, "Business Data Communications and Networking", John Wiley and Sons, New Delhi, 2004
2. William Stallings, "Data and Computer Communications", Prentice Hall, New Delhi, 2005

MT 9314　　　　　　　**COBOL PROGRAMMING**　　　　**L T P C**
　　　　　　　　　　　　　　　　　　　　　　　　　　　3 1 0 4

UNIT I　　　**INTRODUCTION**　　　　　　　　　　　　　**(9)**
Structure of a COBOL Program- Coding Format for COBOL Programs- Character Set, COBOL words- Data Names and Identifiers- Literal, Figurative Constants- Continuation of lines and notations-divisions and its sections-IDENTIFICATION, ENVIRONMENT, DATA, PROCEDURE.

UNIT II　　　**USING I/O FACILITIES**　　　　　　　　　　**(9)**
Basic verbs- Conditional and sequential verbs- writing complete programs-Introduction-Sample program- program testing and style- Types of Clause- Elementary and Group Moves- CORRESPONDING Options.

UNIT III　　　**IMPROVING THE PROGRAMS**　　　　　　　**(9)**
Table Handling- PERFORM - indexed Table and Indexing-SET Verb- SEARCH Verb-OCCURS DEPENDING Clause- Structured programming - Current Trends -Objectives - methodologies-basic structures-combinations- Weakness of COBOL in Structured Programming.

UNIT IV   USING INTERFACES TO OTHER PRODUCTS   (9)
Sequential Files-file description-fixed length records- variable length records-
Statements for Sequential Files- I-O CONTROLS- Sorting and Merging.

UNIT V   SPECIALIZED PROGRAMMING TASKS   (9)
Introduction to JCL, Statements, Format of Statements, Procedure and Symbols,
COBOL using JCL.

L – 45 T – 15 Total – 60

REFERENCES:
1. Roy M.K., and Dastidar Ghosh D., COBOL Programming, Tata McGraw Hill.
2. E. Balagurusamy, COBOL Programming –A Self Study Text, MACMILLAN
    1999
3. *"VS COBOL II Application Programming Language"*
4. *" z/OS V1R10.0 MVS JCL Reference", Thirteenth Edition, September 2008, IBM
    Corp*
5. "z/OS V1R6.0-V1R10.0 MVS JCL User's Guide", Fifth Edition, September 2004, IBM
    Corp.

**MT 9315   ADVANCED DATABASE TECHNOLOGY   L T P C
                                                          3 1 0 4**

UNIT I   INTRODUCTION   9
Review of the formal relational data model - Database architecture, Components of
database management system – DDL, DML. Database Security and Database recovery,
Creating SQL Databases and Tables, Defining tables and views, Specifying integrity
constraints, Selecting Data, Queries – stored procedures and functions - triggers and
active databases

UNIT II   DATABASE DESIGN ISSUES: 9
ER Model - Normalization - Security - Integrity - Consistency - Database Tuning --
Optimization and Research Issues – Design of active databases - spatio-temporal
databases - multi-media databases

UNIT III   TRANSACTION PROCESSING: 9
Introduction – Properties of transaction – Serializability – Concurrency control – Locking
mechanisms – two-phase comMMF protocol – dead locks – Database recovery

UNIT IV   DISTRIBUTED DATABASES: 9
Architecture- Design considerations-Interoperability Query processing - semi-joins -
query optimization - Concurrency control – transactions and Heterogeneity issues –
schema translation and schema integration

UNIT V   **OBJECT ORIENTED DATABASES**:   **9**
Object-oriented data models - Object Identity and its implementation – Supporting object modeling in database systems--Database programming and querying in object-oriented databases - ODMG standard, including ODL, OQL – Comparing RDBMS with OODBMS

L – 45 T – 15 Total – 60

REFERENCES:
1. Raghu Ramakrishnan, Johannes Gehrke, "Database Management Systems", Tata Mc- Graw Hill, New Delhi, 2004
2. Barry, Eaglestone and Mick, Ridley, "Object Databases: An Introduction", Tata Mc-Graw Hill, New Delhi., 1998.
3. Mario Piattini, Oscar Diaz, "Advanced database Technology and Design",   Artech House Publishers, Massachusetts, 2000.
4. Ozsu M. T. & Valduriez P., "Principles of Distributed Database Systems". , Prentice Hall, New Delhi, 1999.

MT 9316   **DATA STRUCTURES LAB**   **L T P C**
                                                          0 0 3 2

1. Implementation of List (Single, Double, Circular)

2. Implementation of Stack

3. Implementation of Queue.

4. Implementation of Searching Techniques (any Three)

5. Implementation of Sorting Techniques (any Three)

6. Implementation of Hash table

7. Implementation of Heaps

8. Implementation of AVL Rotations

9. Implementation of Prim's Algorithm.

10. Implementation of Breadth First Search Techniques.

11. Implementation of Depth First Search Techniques.

12. Implementation of Dijkstra's Algorithm.

13. Implementation of Kruskal's Algorithm.