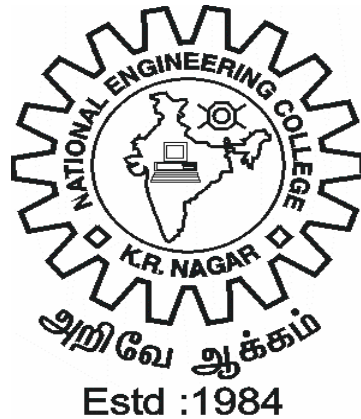


NATIONAL ENGINEERING COLLEGE

(An Autonomous Institution Affiliated to Anna University of Technology Tirunelveli)

K.R.NAGAR, KOVILPATTI – 628 503

REGULATIONS - 2011



**DEPARTMENT OF
COMPUTER SCIENCE AND ENGINEERING**

**CURRICULUM AND SYLLABI OF
MASTER OF COMPUTER APPLICATIONS**

I - SEMESTER

NATIONAL ENGINEERING COLLEGE

(An Autonomous Institution Affiliated to Anna University of Technology Tirunelveli)

M.C.A. (MASTER OF COMPUTER APPLICATIONS)

I SEMESTER

Sl. No.	Course Code	Course Title	L	T	P	C
Theory						
1.	MCA101	Computer_Organization	3	0	0	3
2.	MCA102	Problem Solving and Programming	3	0	0	3
3.	MCA103	Database Management Systems	3	0	0	3
4.	MCA104	Data Structures	3	1	0	4
5.	MME102	Accounting and Financial Management	3	1	0	4
Practical						
6.	MCA131	Programming and Data Structures Lab	0	0	3	2
7.	MCA132	DBMS Lab	0	0	3	2
TOTAL			15	2	6	21

Approved by

Chairman of BOS
Dept. of CSE
Dr.B.Paramasivan

Dean (Academic)
Dr.B.sankaragomathi

Chairman of Academic
Council & Principal
Dr.P.Subburaj

OBJECTIVES:

1. To study the Digital fundamentals
2. To understand the concepts and issues of Computer Organization and Architecture together

Hours Required per week	Lecture	Tutorial	Practical	Credit
	3	Nil	Nil	3
Total	45	-	-	-

UNIT I DIGITAL FUNDAMENTALS 8

Number Systems and Conversions – Boolean Algebra and Simplification – Minimization of Boolean Functions – Karnaugh Map, Logic Gates – NAND – NOR Implementation.

UNIT II COMBINATIONAL AND SEQUENTIAL CIRCUITS 10

Design of Combinational Circuits – Adder / Subtractor – Encoder – Decoder – MUX / DEMUX – Comparators, Flip Flops – Triggering – Master – Slave Flip Flop – StateDiagram and Minimization – Counters – Registers.

UNIT III BASIC STRUCTURE OF COMPUTERS 9

Functional units – Basic operational concepts – Bus structures – Performance and Metrics – Instruction and instruction sequencing – Hardware – Software Interface – Addressing modes – Instructions – Sets – RISC and CISC – ALU design – Fixed point and Floating point operation.

UNIT IV PROCESSOR DESIGN 9

Processor basics – CPU Organization – Data path design – Control design – Basic concepts – Hard wired control – Micro programmed control – Pipeline control – Hazards
– Super scalar operation.

UNIT V MEMORY AND I/O SYSTEM 9

Memory technology – Memory systems – Virtual memory – Caches – Design methods – Associative memories – Input/Output system – Programmed I/O – DMA and Interrupts – I/O Devices and Interfaces.

TEXT BOOKS:

1. Morris Mano, “Digital Design”, Prentice Hall of India, 1997.
2. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, Firth Edition, “Computer Organization”, Tata McGraw Hill, 2002.

REFERENCES:

1. Charles H. Roth, Jr., “Fundamentals of Logic Design”, Jaico Publishing House, Mumbai, Fourth Edition, 1992.
2. William Stallings, “Computer Organization and Architecture – Designing for Performance”, Sixth Edition, Pearson Education, 2003.
3. David A. Patterson and John L. Hennessy, “Computer Organization and Design: The Hardware/Software interface”, Second Edition, Morgan Kaufmann, 2002.
4. John P. Hayes, “Computer Architecture and Organization”, Thrid Edition, Tata McGraw Hill, 1998.

MCA102**PROBLEM SOLVING AND PROGRAMMING****OBJECTIVES:**

1. To learn and analyze problems and to formulate algorithms.
2. To introduce computer systems with emphasis on hardware,
3. To learn about numerical methods used to solve engineering problems with the help of computer programs.

Hours Required per week	Lecture	Tutorial	Practical	Credit
	3	Nil	Nil	3
Total	45	-	-	-

UNIT I INTRODUCTION TO PROGRAMMING 9

Introduction to computing – building blocks for simple programs – problem to program – Decision structures – loop structures – problem analysis – programming style –documentation and testing.

UNIT II PROGRAMMING PARADIGMS 9

Procedural – functional – recursive – rule-based – structured programming.

UNIT III PROBLEM SOLVING TECHNIQUES 9

Programming life cycle phases – problem solving – implementation – maintenance – pseudo code representation – flow charts - algorithms – algorithmic efficiency – complexity of algorithms.

UNIT IV C PROGRAMMING FUNDAMENTALS 9

Structured program development – Data types – operators – expressions – control flow – arrays and pointers – functions – Input – output statements – storage classes.

UNIT V ADVANCED FEATURES 9

Strings - Recursion – structures – unions – bit manipulations – enumerations – file processing – fundamental data structures.

REFERENCES:

1. Kernigan Brian W., and Dennis M. Ritchie, “The C Programming Language”, Second Edition, Prentice Hall, 1988.
2. Deitel and Deitel, “C How to program”, Prentice Hall, 1994.
3. Cormen, Leiserson, Rivest, Stein “Introduction to algorithms”, McGraw Hill publishers, 2002.

MCA103**DATABASE MANAGEMENT SYSTEMS****OBJECTIVES:**

1. To understand Database design and normalization techniques.
2. To use Standard Query Language and its various versions.
3. To understand Importance of backup and recovery techniques.
4. To develop Database system to handle the real world problem.

Hours Required per week	Lecture	Tutorial	Practical	Credit
	3	Nil	Nil	3
Total	45	-	-	-

UNIT I INTRODUCTION 9

Historical perspective - Files versus database systems - Architecture - E-R model - Security and Integrity - Data models.

UNIT II RELATIONAL MODEL 9

The relation - Keys - Constraints - Relational algebra and Calculus - Queries - Programming and triggers

UNIT III DATA STORAGE 9

Disks and Files - file organizations - Indexing - Tree structured indexing - Hash Based indexing

UNIT IV QUERY EVALUATION AND DATABASE DESIGN 9

External sorting - Query evaluation - Query optimization - Schema refinement and normalization - Physical database design and tuning - Security

UNIT V TRANSACTION MANAGEMENT 9

Transaction concepts - Concurrency control - Crash recovery - Decision support – Case studies

REFERENCES:

1. Raghu RamaKrishnan and Johannes Gehrke, "Database Management Systems", McGraw Hill International Editions, 2000.
2. C. J. Date, "An Introduction to Database Systems", Seventh Edition, Addison Wesley, 1997.
3. Abraham Silberschatz, Henry. F. Korth and S. Sudharshan, "Database system Concepts", Third Edition, Tata McGraw Hill, 1997.

OBJECTIVES:

1. To analyze the usage of different data structures and algorithm design methods which impacts the performance of programs.
2. To teach how to choose the appropriate data structure and algorithm design method for a specified application.
3. Write programs using object-oriented design principles.
4. To solve problems using algorithm design methods such as the greedy method, divide and conquer, dynamic programming, backtracking, and branch and bound and writing programs for these solutions.

Hours Required per week	Lecture	Tutorial	Practical	Credit
	3	1	Nil	4
Total	45	15	-	-

UNIT I DATA STRUCTURES 9

Introduction – Arrays – Structures – Stack: Definition and examples, Representing Stacks - Queues and lists: Queue and its Representation, lists – Applications of Stack, Queue and Linked Lists.

UNIT II TREES 9

Binary Trees – Operations on binary trees - Binary Tree Representations – node representation, internal and external nodes, implicit array representation – Binary tree Traversals - Huffman Algorithm – Representing Lists as Binary Trees

UNIT III SORTING AND SEARCHING 9

General Background – Exchange sorts – Selection and Tree Sorting – Insertion Sorts – Merge and Radix Sorts – Basic Search Techniques – Tree Searching – General Search Trees – Hashing.

UNIT IV GRAPHS AND THEIR APPLICATIONS 9

Graphs – An application of graphs – Representation – transitive closure - Warshall's algorithm – Shortest path algorithm - a flow Problem – Dijkstra's algorithm – An application of scheduling - Linked representation of Graphs – Graph Traversals

UNIT V STORAGE MANAGEMENT 9

General Lists: Operations, linked list representation, using lists, Freeing list nodes - Automatic list Management: Reference count method, Garbage Collection, Algorithms, Collection and compaction

TEXTBOOK

Tanaenbaum A.S.,Langram Y. Augestein M.J “ Data Structures using C” Pearson Education , 2004

REFERNCES

1. Robert Kruse & Clovis L. Tondo “ Data Structures and Program Design in C”,Prentice Hall , 2nd edition.,1991.
2. Weiss “Data Structures and Algorithm Analysis in C ” ,Addison Wesley , Second Edition, 1997.

OBJECTIVES:

1. To understand the scope of accounting and its principles
2. To study the various analysis methods in accounting
3. To study the various budgeting and computerized accounting
4. To know about the working capital management

Hours Required per week	Lecture	Tutorial	Practical	Credit
	3	1	Nil	4
Total	45	15	-	-

UNIT I FINANCIAL ACCOUNTING 9

Meaning and Scope of Accounting-Principles-Concepts-Conventions-Accounting Standards-Final Accounts-Trail Balance-Trading Account-Profit and Loss Account- Balance Sheet-Accounting Ratio Analysis-Funds Flow Analysis-Cash Flow Analysis

UNIT II ACCOUNTING 9

Meaning-Objectives-Elements of Cost-Cost Sheet-Marginal Costing and Cost Volume Profit Analysis-Break Even Analysis-Applications-Limitations-Standard Costing and Variance Analysis-Material-Labor-Overhead-Sales-Profit Variances

UNIT III BUDGETS AND BUDGETING CONTROL 9

Budgets and Budgetary Control-Meaning-Types-Sales Budget-Production Budget-Cost of Production Budget-Flexible Budgeting-Cash Budget-Master Budget-Zero Base Budgeting-Computerized Accounting

UNIT IV INVESTMENT DECISION AND COST OF CAPITAL 9

Objectives and Functions of Financial Management-Risk-Return Relationship-Time Value of Money Concepts-Capital Budgeting-Methods of Appraisal-Cost of Capital Factors Affecting Cost of Capital-Computation for Each Source of Finance and Weighted Average Cost of Capital

UNIT V FINANCING DECISION AND WORKING CAPITAL MANAGEMENT 9

Capital Structure-Factors Affecting Capital Structure-Dividend Policy-Types of Dividend Policy-Concepts of Working Capital-Working Capital Policies-Factors affecting Working Capital-Estimation of Working Capital Requirements

TEXTBOOK

1. S.N.Maheswari, "Financial and Management Accounting", Sultan Chand & Sons, 2003
2. I.M.Pandey, "Financial Management", Vikas Publications, 4th Reprint, 2002

REFERENCES

1. S.P.Iyengar, "Cost and Management Accounting", Sultan Chand & Co,
2. I.M.Pandey, "Elements of Management Accounting" Vikas Publishing House, 1993

MCA131

PROGRAMMING AND DATA STRUCTURES LAB

LAB OBJECTIVES:

1. Learn how to implement some useful concepts of data structures
2. To implement various sorting techniques.
3. To understand the effect of data structures on an algorithm's complexity.

Hours Required	Lecture	Tutorial	Practical	Credit
per week	Nil	Nil	3	2
Total	-	-	45	-

LIST OF EXPERIMENTS:

1. Stack and Queue
2. Binary tree Traversals
3. Merge Sort
4. DFS and BFS
5. Warshall's Algorithm
6. Dijkstra's Algorithm
7. Huffman's Algorithm
8. Insertion Sort

Required Software: C, C++

MCA132**DBMS LAB****LAB OBJECTIVES:**

To understand the fundamentals as well as advanced concepts of Databases, Oracle, SQL Server and MS-Access.

Hours Required per week	Lecture	Tutorial	Practical	Credit
	Nil	Nil	3	2
Total	-	-	45	-

LIST OF EXPERIMENTS:

1. Creation of base tables and views.
2. Data Manipulation
INSERT, DELETE and UPDATE in tables
SELECT, Sub Queries and JOIN
3. Data Control Commands
4. High level language extensions – PL/SQL. Or Transact SQL
5. Use of Cursors, Procedures and Functions
6. Embedded SQL or Database Connectivity.
7. Oracle or SQL Server Triggers.
8. Working with Forms, Menus and Reports.
9. Front-end tools – Visual Basic/Developer 2000

Required Software: Oracle 9i, SQL Server and MS-Access