

**COURSE STRUCTURE & SYLLABUS OF  
MASTER OF TECHNOLOGY (M.TECH)**

*In*

**Computer**

**Course Structure**

**First Year**

**First Semester**

<b>Paper Code</b>	<b>Subject</b>
MFCO1	Data Structures and Object Representation
MFCO2	Advanced Computer System Architecture
MFCO3	Design and Analysis of Algorithm
MFCO4	Pattern Recognition and Application

**Syllabus**

**MFCO1 : DATA STRUCTURE AND OBJECT REPRESENTATION**

Abstract Data Types :- ADT Specification; Efficiency of Algorithms; Algorithmic Analysis : Worst-Case, Average- Case; Matrix ADT Implementation in C; Classes and Objects; Sequential Mapping ; Linked List Implementation; Dynamic Set Operations; The Stack and Queue ADTs ; Hash Tables; Hash Functions; Analysis of Uniform Hashing; The Priority Queue ADT; Graph Problems; Breadth-First Search; Depth- First Search; Shortest Paths; Amortized Analysis : Accounting Method, Potential Method; Splay Trees; Non Amortized Data Structures – Binary Heaps; Amortized Data Structures – Skew Heaps, Lazy Binomial Heaps ; List-Based Data Structures; Quad Trees; The Disjoint-Set ADT.

**MFCO2 : ADVANCED COMPUTER SYSTEM ARCHITECTURE**

1. Introduction
2. Central Processing Unit-CISC Characteristics, RISC Characteristics
3. Pipeline and Vector Processing-Pipelining, Arithmetic Pipeline, Vector Processing, Array Processors, SIMD Array Processor

4. Multiplication algorithms: Introduction, addition & subtraction, multiplication algorithms, hardware implementation for signed-magnitude data, hardware algorithm, Booth multiplication algorithm, array multiplier, divide overflow, floating-point arithmetic operation, multiplication, division, floating-point operations
5. Asynchronous Data Transfer-Strobe Control, Handshaking, Direct Memory Access (DMA)- DMA Controller, DMA Transfer
6. Memory Organization-Memory Hierarchy, Cache Memory-Associative Mapping, Direct Mapping, Set Associative Mapping, Virtual Mapping, Memory Management Hardware
7. Multiprocessors-Interconnection structures- Time Shared Common Bus; Multiport Memory; Crossbar Switch; Multistage Switching Network; Hypercube Interconnection, Dynamic Arbitration Algorithms, Cache Coherence-Conditions for Incoherence, Solutions to the Cache Coherence Problem, problems

### **MFCO3 : DESIGN AND ANALYSIS OF ALGORITHM**

#### **1. INTRODUCTION**

#### **2. THE BASIC STEPS IN THE DEVELOPMENT OF AN ALGORITHM**

The Problem-Solving Aspect, Implementation Of Algorithms, Program Verification, The Efficiency Of Algorithms, The Order Notation

#### **3. SOME DATA STRUCTURE**

Stacks and queues, trees, binary trees, heaps and heapsort, graphs, hashing.

#### **4. ELEMENTARY NOTIONS FROM PROBABILITY AND STATISTICS**

Probability, Axioms Of Probability, Discrete Probability Distributions, Bayes's Theorem, District Random Variables, Statistics, Linearity, Arithmetic Series

#### **5. HEURISTICS: TRAVELING SALESPERSON PROBLEM**

Traveling Salesperson Problem, Efficiency Considerations

#### **6. BRANCH AND BOUND PROBLEM**

The Method, Lc-Search, Control Abstractions For Lc-Search, Properties Of Lc-Search, Bounding, Lc Branch-And-Bound

#### **7. RECURSION AND BACKTRACK PROGRAMMING**

Introduction, When Not To Use Recursion, Two Examples Of Recursive Programs, Backtrack Programming, The Eight Queens Problem, The Stable Marriage Problem, The Optimal Selection Problem

#### **8. SHORTEST PATHS PROBLEM**

Unweighted Shortest Paths, Dijkstra's Algorithm, Acyclic Graphs, Prim's Algorithm, Kruskal's Algorithm

#### **9. SORTING**

General Background, Efficiency Consideration, Efficiency Of Sorting, Exchange Sorts, Quicksort, Efficiency Of Quick Sort, Binary Tree Sorts, Heapsort, Insertion Sorts, Shell Sort

#### **10. SEARCHING**

Basic Search Techniques, Algorithmic Notation, Sequential Searching, Efficiency Of Sequential Searching, Reordering A List For Maximum Search Efficiency, Indexed Sequential Search, Binary Search, Interpolation Search

**11. ARITHMETIC AND LOGICAL EXPRESSIONS**

The General Method, Evaluation And Interpolation, Interpolation

**12. SETS AND SOME BASIC SET ALGORITHMS**

Sets, Relations, Functions, Sets And Disjoint Set Union

**MFCO4 : PATTERN RECOGNITION & APPLICATION**

Applications of Pattern Recognition; Statistical Decision Theory; Image Processing and Analysis; Statistical Decision Making : Decision Boundaries , Estimation of Error rates, Estimating the Composition of Populations; Nearest Neighbor Classification Techniques; Choosing a Decision Making Technique; Clustering : Hierarchical, Partitional ; Geometric Image Scaling and Interpolation; Smoothing Transformations; Logarithmic Gray Level Scaling ; The Statistical Significance of Image Features ; Image Analysis : Hough Transforms, Shapes of Regions, Morphological Operations , Texture, System Design, Image Sequences, Image Compression.

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**Course Structure**

**First Year**

**Second Semester**

<b>Paper Code</b>	<b>Subject</b>
MFCO5	Advanced Operating System
MFCO6	Computer Communications Network
MFCO7	Neural Network and applications
MFCO8	Parallel Processing

**Syllabus**

**MFCO5 ADVANCED OPERATING SYSTEM**

**1. COMPUTER ARCHITECTURE:**

4 GL Program , 3GL (HLL)Program,

**2. OPERATING SYSTEM FUNCTIONS:**

What is an Operating Systems ? , Different Services of the Operating System, Uses of System Calls, The Issue of Protability, The Kernel

**3. INFORMATION MANAGEMENT:**

The file System, Device Driver (DD), Terminal I/O.

**4. PROCESS MANAGEMENT:**

What is Process , Evolution of Multiprogramme, Process States, Process Control Block (PCB), Create, Kill, Dispatch a Process,

**5. INTER- PROCESS COMMUNICATION:**

The Producer –Consumer Problems.

**6. DEADLOCKS:**

Deadlock Prerequisites, Deadlock Strategies,

**7. MEMORY MANAGEMENT (MM):**

Paging, Segmentation, Virtual Memory Management Systems,

**8. OPERATING SYSTEMS: SECURITY AND PROTECTION:**

Security Threats, Security Design Principles, Protection Mechanisms, Encryption, Security in Distributed Environment.

**9. PARALLEL PROCESSING:**

Operating Systems for Parallel Processes, Case Study: Mach

**10. OPERATING SYSTEMS IN DISTRIBUTED PROCESSING:**

Lan Environment and Protocols,

**11. UNIX: A CASE STUDY:**

Overview of UNIX, UNIX File System, Data Structure for Process / Memory Management, Executing and Terminating a Program in UNIX, Using the System (Booting and Login), Memory Management, Terms and Concepts Introduced, Test Questions.

**MFCO6 COMPUTER COMMUNICATIONS NETWORKS**

**1. BASIC ORIENTATION**

**2. PROTOCOLS AND FACILITIES:**

Properties of Data Traffic, Protocols, Data Transmission, Data Networks.

**3. PURE BIRTH AND BIRTH –DEATH PROCESS: APPLICATION TO QUEUING:**

Bernouli Trials- Markov Chains, The Poisson Process, Pure Birth Processes, Birth – Death Processes, Queuing Models, Burke's Theorem, Communications Example

**4. IMBEDDED MARKOV CHAIN: THE M/G/I/ QUEUE**

**5. IMBEDDED MARKOV CHAIN ANALYSIS OF TIME- DIVISION MULTIPLEXING.**

Asynchronous Time- Division Multiplexing, Synchronous Time- Division Multiplexing, Message Delay, Alternate Derivation Average Delay in STDN.

**6. INTERMITTENTLY AVAILABLE SERVER, PRIORITY QUEUES : APPLICATION TO RING SYSTEMS:**

Interrupted Service, Priority Queues, Preemptive Resume Discipline, Non- preemptive Priorities

**7. POLLING:**

Basic Model: Applications.

**8. RANDOM ACCESS SYSTEMS:**

ALOHA and Slotted ALOHA, Carrier Sense Multiple Access. Delay Calculations CSMA/CD.

## **9. PROBING AND TREE SEARCH TECHNIQUES:**

Cycle Time in Probing

## **10. NETWORKS OF QUEUES:**

Jackson Networks, Multidimensional Birth- Death Processes; Queues in Tandem.

## **11. CONGESTION AND FLOW CONTROL:**

HDLC, Computation Techniques – Closed Networks.

## **12. ROUTING –FLOW ALLOCATION:**

Shortest – Path Algorithms, Flow Control and Routing.

## **MFC07 NEURAL NETWORKS AND APPLICATIONS**

### **1. BIOLOGICAL NEURAL NETWORKS:**

Neuron Physiology: Factors Affecting Potassium- Ion Flow, Neuronal Diversity, Specification of the Brain; The Eye's Neural Network: Retina Structure , Image Processing in the Retina.

### **2. ARTIFICIAL NEURAL NETWORKS: CONCEPTS:**

Neural Attributes: Artificial Neural Networks, Learning in Artificial Neural Networks: The Delta Rule , Artificial Neural Network Topologies, Algorithms; ANN Adaptability.

### **3. FUZZY LOGIC:**

Propositional Logic , Fuzzy Logic , Time- Dependent Fuzzy Logic: Crisp Logics , Temporal Fuzzy Logic (TFL) , Applying Temporal Fuzzy Operators, Defuzzification of Temporal Fuzzy Logic, Example: Applicability of TFL in Communication Systems.

### **4. FUZZY NEURAL NETWORKS:**

Fuzzy Artificial Neural Network ( FANN) , Fuzzy Neural Example, Neuro – Fuzzy Control: Traditional Control; Neural Control,; Fuzzy Control; Fuzzy- Neural Control

### **5. APPLICATIONS:**

Signal Processing; Image Data Processing: Handwritten Character Recognition; Visual Image Recognition , Communications Systems: Call Processing ; Switching Traffic Control ; Packet Radio Network Routing , Intelligent Control , Tools and Companies

## **MFC08 PARALLEL PROCESSING**

### **1. INTRODUCTION:**

Why Parallel Processing ? Shared Memory Multiprocessing, Distributed Memory

### **2. PARALLEL PROCESSING ARCHITECTURES:**

Parallelism In Sequential Machines, Abstract Model Of Parallel Computer, Multiprocessor Architecture, Pipelining, Array Processors.

**3. PROGRAMMABILITY ISSUES:**

An Overview, Software Tools.

**4. DATA DEPENDENCY ANALYSIS:**

Types Of Dependence, Loop And Array Dependence, Loop Dependence Analysis, Solving Diophantine Equations, Program Transformations

**5. THREAD –BASED IMPLEMENTATION:**

Thread Management , Example With Threads, Attributes Of Threads, Mutual Exclusion With Threads, Mutex Usage Of Threads, Thread Implementation, Java Threads.

**6. DISTRIBUTED COMPUTING –II: REMOTE PROCEDURE CALL:**

Parameter Passing, Locating The Server

**7. ALGORITHMS FOR PARALLEL MACHINES:**

Speedup, Complexity And Cost, Parallel Reduction, Quadrature Problem, Matrix Multiplication, Parallel Sorting Algorithms, Solving Linear Systems, Probabilistic Algorithms.

**8. DISTRIBUTED DATA BASES:**

Objectives, Distribution Options, Database Integrity, Concurrency Control , DBMS Structure.

**9. DISTRIBUTED OPERATING SYSTEMS:**

Network Operating Systems.

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**Course Structure**

**Second Year**

**Third Semester**

<b>Paper Code</b>	<b>Subject</b>
MSCO1	Automation Engineering
MSCO2	Mobile Computing
MSCO3	Fuzzy Set Theory & Application
MSCO4	Design Principles of Language Translator

**SECOND YEAR**

**IIIrd Semester**

**MSCO1 AUTOMATION ENGINEERING**

**1 ROBOTICS: HISTORY, PRESENT STATUS AND FUTURE /TRENDS**

- 1.1 Philosophical Considerations
- 1.2 Robotics and Programmable Automation
- 1.3 Historical Background
- 1.4 Laws of Robotics
- 1.5 Robot Definitions
- 1.6 Robotics Systems and Robot Anatomy
- 1.7 Human Systems and Robotics
- 1.8 Specifications of Robots
- 1.9 Present Application Status
- 1.10 Machine Intelligence, Computer and Robotics-Future Trends
- 1.11 Safety Measures in Robotics

**2 ROBOT KINEMATICS**

- 2.1 Introduction
- 2.2 Forward and Reverse Kinematics (Transformation) of Three Degrees of Freedom Robot Arm
- 2.3 Forward and Reverse Transformation of a Four Degrees of Freedom Manipulator in 3-D
- 2.4 Homogeneous Transformations
- 2.5 Kinematic Equations Using Homogeneous Transformations

### **3 ROBOT DRIVES, ACTUATORS AND CONTROL**

- 3.1 "Functions of Drive Systems
- 3.2 General Types of Fluids
- 3.3 Pump Classification
- 3.4 Introduction to Pneumatic Systems
- 3.5 Electrical Drives
- 3.6 DC Motors and Transfer Functions
- 3.7 Stepper Motor
- 3.8 Drive Mechanisms

### **4 ROBOT END-EFFECTORS**

- 4.1 Introduction
- 4.2 Classification of End-effectors
- 4.3 Drive System for Grippers
- 4.4 Mechanical Grippers
- 4.5 Magnetic Grippers
- 4.6 Vacuum Grippers
- 4.7 Adhesive Grippers
- 4.8 Hooks, Scoops and Other Miscellaneous Devices
- 4.9 Gripper Force Analysis and Gripper Design
- 4.10 Active and Passive Grippers

### **5 SENSORS AND INTELLIGENT ROBOTS**

- 5.1 Artificial Intelligence and Automated Manufacturing
- 5.2 AI and Robotics
- 5.3 Need for Sensing Systems
- 5.4 Sensory Devices
- 5.5 Types of Sensors
- 5.6 Robot Vision Systems

### **6 ROBOT LANGUAGES AND PROGRAMMING**

- 6.1 Robot Languages
- 6.2 Classification of Robot Languages
- 6.3 Computer Control and Robot Software
- 6.4 VAL System and Language

### **7 BASIC ELECTRONICS AND COMPUTER INTERFACING**

- 7.1 Introduction
- 7.2 Basic Electronic Components
- 7.3 Digital Circuits and Devices
- 7.3 Computers and Microprocessors
- 7.4 Common Input-Output Devices and Standard Interfaces

### **8 FLEXIBLE AUTOMATION TECHNOLOGY**

- 8.1 Introduction to Flexible Automation
- 8.2 Flexible Automation-A New Tool

## **9 QUANTITATIVE TECHNIQUES FOR ECONOMIC PERFORMANCE**

- 9.1 Feasibility of the Robotization Plan
- 9.2 Data Acquisition
- 9.3 Investment and Evaluation Strategies
- 9.4 Planning for Robot Installation

## **10 APPLICATIONS OF ROBOTS**

- 10.1 Introduction
- 10.2 Capabilities of Robots
- 10.3 Robotics Applications
- 10.4 Obstacle Avoidance
- 10.5 Other Uses of Robots
- 10.6 Robotics in India
- 10.7 The Future of Robotics

## **MSCO2 MOBILE COMPUTING**

### **1. Introduction**

Applications, Replacement of wired networks, Location dependent services, Mobile and wireless devices, A short history of wireless communication, A market for mobile communications, Some open research topics, A simplified reference model

### **2. Mobile channel characterization**

Fading and shadowing, communication issues , antennas, signal propagation, path loss of radio signals, multipath propagation, multiplexing, space division multiplexing, frequency division multiplexing, time division multiplexing, code division multiplexing, modulation, advanced frequency shift keying, multicarrier modulation , direct sequence spread spectrum,

### **3. Review of cellular schemes**

Model and methodology, mobile computing topologies, networks and protocols, GSM, system architecture, network and switching subsystem, operation subsystem, radio interface, logical channels and frame hierarchy, handover, authentication, encryption , hscsd, umts and imt-2000, umts basic architecture, ultra fod mode, ultra tdd mode, SDMA, FDMA, TDMA.

### **4. Mobility management**

Mobile ip, entities and terminology, ip packet delivery, agent advertisement and discovery, optimizations, dynamic host configuration protocol, fast retransmit/fast recovery, transaction oriented TCP.

### **5. Wireless LAN and data PCS, wiring the campus**

Infrared vs. Radio transmission, infrastructure and ad hoc networks , direct sequence spread spectrum, medium access control layer, basic DFWMAC-DCF using CSMA/CA, user scenarios, mac layer, packet format, link management,

## **6. Application frameworks**

Architectures now and in the future, today's application architectures, architecture overview, service enablers, *service capability servers*, *application support servers*, personal service environment, personal service environment, service management,

## **7. Exploiting mobility commercially**

Location-based services, positioning methods, terminal-based positioning: gps and a-gps, enhanced observed time difference (e-otd), network-based positioning: ul-toa, which solutions will we use, and what are the consequences?,

## **8. File system, Accessing the World Wide Web**

File systems, little work, ficus, mio-nfs, accessing the world wide web , hypertext markup language, some approaches that might help wireless access, system architectures, wireless application protocol, wireless data gram protocol, wireless transaction protocol, wsp/b over wtp, wsp/b as connectionless session service, wireless markup language, **WTP class 0, WMLScript**

## **9. Privacy and anonymity**

How secure does it have to be?, securing the transmission, authentication, encryption, protecting the message integrity, gsm/gprs/3g network security, algorithm decision, security protocols and their wireless usage, redundant security, making decisions and security perspectives.

# **MSC03 FUZZY SET THEORY AND APPLICATION**

## **1. FUZZY SET THEORY**

Introduction, Background, Uncertainty and Imprecision, Statistics and Random Processes, Uncertainty in Information, Fuzzy Sets and Membership, Chance Versus Ambiguity

## **2. FUZZY SETS-BASIC DEFINITIONS AND EXTENSIONS**

Crisp Versus Fuzzy Sets, Example 1 Fuzzy Sets Versus Crisp Sets, Form Fuzzy Sets To Fuzzy Events, Fuzzy Set Operations, Properties Of Fuzzy Sets, Fuzzification Techniques, Alpha Cuts

## **3. MEASURE OF FUZZYNESS**

Fuzzy Measures, Belief And Plausibility, Evidence Theory, Probability Measures

#### **4. THE EXTENSION PRINCIPLE AND APPLICATIONS, FUZZY NUMBERS**

Principle, Fuzzy Transform (Mapping), Fuzzy Numbers, Interval Analysis In Arithmetic, Approximate Methods Of Extension, DSW Algorithm

#### **5. FUZZY RELATIONS AND FUZZY GRAPHS**

Fuzzy Relations On Sets And Fuzzy Sets, Compositions Of Fuzzy Relations, Properties Of The Min-Max Composition, Reflexivity, Symmetry, Transitivity, Fuzzy Graphs, Special Fuzzy Relations

#### **6. FUZZY ANALYSIS**

Fuzzy Functions On Fuzzy Sets, Extrema Of Fuzzy Functions, Integration Of Fuzzy Functions, Integration Of A (Crisp) Real-Valued Function Over A Fuzzy Interval, Fuzzy Differentiation

#### **7. POSSIBILITY THEORY, FUZZY POSITIONING**

Possibility Distributions as Fuzzy Sets, Fuzzy Positioning, Image Stabilization For Camcorders, Television Sets

#### **8. FUZZY APPROXIMATE REASONING**

Fuzzy Logic, Approximate Reasoning, Fuzzy Tautologies, Contradictions, Equivalence, and Logical Proofs, Other Forms of the Implication Operation, Other Forms of The Composition Operation

#### **9. EXPERT SYSTEMS**

Fuzzy Set and Expert Systems, Introduction to Expert Systems

#### **10. FUZZY CONTROL**

Review Of Control System Theory, Simple Fuzzy Logic Controllers, General Fuzzy Logic Controllers, Special Forms Of Fuzzy Logic Control System Models, Examples Of Fuzzy Control System Design, Classical Fuzzy Control Problem: Inverted Pendulum

#### **11. PATTERN RECOGNITION, FUZZY SCENE ANALYSIS, FUZZY GRAMMARS AND AUTOMATA**

Analysis, Partitions of The Feature Space, Single Sample Identification, Multifeature Pattern Recognition, Fuzzy Scene Analysis, Syntactic Recognition

## **12. DECISION MAKING IN FUZZY ENVIRONMENT, FUZZY LINEAR AND GOAL PROGRAMMING**

Fuzzy Decisions, Fuzzy Linear Programming, Symmetric Fuzzy LP, Fuzzy Dynamic Programming, Fuzzy Multi Criteria Analysis.

## **MSCO4 DESIGN PRINCIPLES OF LANGUAGE TRANSLATORS**

### **1. INTRODUCTION**

Systems Programs And Translators, The Relationship Between High-Level Languages And Translators

### **2. OVERVIEW OF COMPILER STRUCTURE**

Compilers, the analysis-synthesis model of compilation, analysis of the source program, lexical analysis, semantic analysis, analysis in text formatters, the phases of a compiler, symbol-table management, error detection and reporting, the analysis phases, intermediate code generation, code optimization, code generation, code generation, assemblers, two-pass assembly, loaders and link-editors, the grouping of phases, compiler-construction tools

### **3. BASICS OF GRAMMAR THEORY**

Equivalent grammars , some simple restrictions on grammars , useless productions and reduced grammars , cycle-free grammars , ambiguous grammars , context sensitivity , the chomsky hierarchy , bnf description of clang , ebnf description of clang , a sample program .

### **FINITE STATE AUTOMATA AND LEXICAL ANALYSIS**

Abstract machines, the role of the lexical analyzer, issues in lexical analysis, tokens, patterns, lexemes, attributes for tokens, input buffering, buffer pairs, specification of tokens.

### **5. SPECIFICATION AND RECOGNITION OF CONTEXT FREE GRAMMARS**

Context-free grammars, generating strings from a cfg, cfgs with epsilon productions, finding all the strings generated by a cfg, cfgs vs regular expressions, simulating a regular expression with a cfg, a cfg with no corresponding re

### **6. PARSING TECHNIQUES**

Top-down parsing, recursive-descent parsing, predictive parsers, translation diagrams for predictive parsers, nonrecursive predictive parsing, first and follow, bottom-up parsing, handles, handle pruning, stack implementation of shift-reduce parsing, viable prefixes, operator-precedence parsing, using operator-precedence relations, operator-precedence relations from associativity and precedence, precedence functions, lr parsers, constructing slr parsing tables

## **7. SYNTAX DIRECTED TRANSLATION**

Embedding semantic actions into syntax rules , attribute grammars, synthesized and inherited attributes , classes of attribute grammars

## **8. SEMANTIC ACTIONS AND INTERMEDIATE CODES**

Intermediate languages, graphical representations, three-address code, types of three-address statements, syntax-directed translation into three-address code, implementations of three-address statements

## **9. STATIC AND DYNAMIC STORAGE MANAGEMENT**

Static and dynamic memory allocation, array allocation and access, a simple static array allocation scheme

## **10. ERROR DETECTION AND RECOVERY**

Classification of errors , lexical and syntax errors, duplicate messages , recovery from syntax errors, regarding a safe parser state , semantic errors, the error print routine, desirable place for printing error messages , invalid number of dimensions for 'h' in statements, object modules and compilation errors , detection of run time errors, indication of run time errors, overflow in statement number 0052 of procedure xyz., programmer recovery options, debugging aids and options, combining different language routines

## **11. CODE GENERATION AND OPTIMIZATION**

Issues in the design of a code generator, the target machine , peephole optimization, code optimization, introduction, criteria for code-improving transformation , the principal sources of optimization, dead-code elimination, induction variables and reduction in strength, optimization of basic blocks

## **12. INTRODUCTION TO NATURAL LANGUAGE TRANSLATION**

Introduction, what is understanding?, what makes understanding hard?, complexity of the target representation, type of mapping, level of interaction among components, conclusion: English is hard, understanding single sentences, understanding words, understanding sentences-syntax, semantics, pragmatics, keyword matching, syntactic analysis, classes of grammars and languages, semantic analysis, semantic grammars, conceptual dependency.

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**Course Structure**

**Second Year**

**Fourth Semester**

**SPECIALIZATION – 2**

<b>Specialization 2</b>	<b>MULTIMEDIA</b>
<b>Paper Code</b>	<b>Subject</b>
MSMM 01	Interactive Multimedia
MSMM 02	Web Programming
MSMM 03	Programming Microsoft ASP.NET
MS 04	Project

**SPECIALIZATION -2 : MULTIMEDIA**

***MSMM 01 : Interactive Multimedia***

Introduction of Multimedia: What is Multimedia? , Introduction to making multimedia, Multimedia skills, Multimedia Building Blocks: Text, Sound, Images, Animation, Video  
Multimedia hardware and software: Macintosh and windows Production platforms, Basic software Tools, Multimedia Authoring tools, Multimedia and the Internet: The Internet and How it Works, Tools for the World Wide Web, Designing for the World Wide Web Assembling and delivering a project: Planning and Costing, Designing and producing, Content and Talent

**MSMM 02: Web Programming**

Introduction to the Internet, creating a WebPages, cascading style sheets, Attributes, lists and tables, images, links and multimedia, WebPages design and layout , Introduction to programming and java script, objects and variables, functions and parameters, forms and interactive server, performing calculations, increasing the interactivity , Loops and Arrays, Strings, Dates and cookies , Custom objects: creating and searching a database, JavaScript with frames and windows.

### **MSMM 03 : Programming Microsoft ASP.NET**

Introduction: Getting started with ASP.NET, Building ASP.NET pages, Using Visual Basic.Net and c#, Using ASP.NET Objects with C# and VB.NET, Beginning web forms, validating ASP.NET pages, Beginning to build databases, reading and writing files on the web server, using ASP. Net's improved caching capabilities, Using Business objects Creating XML Web Services, consuming and securing XML web services, Configuring and deploying ASP.NET Applications, Separating code from content, Debugging ASP.NET pages, securing ASP.NET Applications, Building a complete application, creating mobile web forms.

### **MS 04 : PROJECT**

#### **Project Guidelines :**

#### **Thinking up a Project**

You are expected to come up with your own idea for a project. A wide range of topics is acceptable so long as there is substantial computing content and project is predominantly of a practical, problem-solving nature. You might take up an interest which you already have in your stream of engineering. You may do your project in any reputed organization or a department. Every student is to take up a project individually. The project is a vehicle for you to demonstrate the required level of competence in your chosen field of Masters.

Start thinking about your project right in the beginning. If you want to do the project in industrial environment start your correspondence fairly early to find an organization, which is ready to accept you You must submit an outline of your project (two or three pages) to your guide within one month of start of the project work. This must include the Title, Objective, Methodology (main steps to carry out a project), expected output and organization where you intend to carry out the project.

#### **Arranging a Guide**

When you have an idea of your project, even a tentative one, approach a suitable person who has interest and expertise in that area. The Guide may be a person with M.E. / M.Tech with a five-year working experience or a B.E./ B.Tech having a working experience of fifteen years in relevant field.

#### **Working with the Guide**

The Guide's role is to provide support and encouragement to direct the student's attention to relevant literature, to provide technical assistance occasionally, to read and comment on the draft

report and to give guidance on the standard and amount of work required. The Guide is not responsible to teach any new skills and language required for project work or for arranging any literature or equipment. You are expected to meet at least once a month to your Guide. Rest you can workout your own arrangement. The students, who are content to carry out their work largely without supervision, should keep their Guide in touch with what they are doing. A student should not remain silent for months and then appear with a complete project work unknown to supervisor. In such circumstances, the Guide cannot be counted on to give an automatic seal of his approval. If a project produces a piece of software, the Guide would normally expect to see a demonstration of the software in action.

The main purpose of the report is to explain what you did in your project. The reader should be able to see clearly what you set out to do and what you achieved. It should describe the problem addresses and explain why you tackled it in the way you did. It should include your own assessment of how successful the project was.

Resist temptation to include pages of padding. If the project consists of developing an application in area with which a computer scientist would not be familiar – such as chemical testing, stock & shares – it might be necessary to include some explanatory company/ organization profile for whom you have done the work must not appear in chapters and must go to appendix part.

The work that is presented for examiners should be your own. The presentation of another person's work, design or program as though they are your own is a serious examination offence. Direct quotation form the work of others (published or un published) must always be clearly identified as such by being placed in quotation marks, it is essential that reader should be able to see where the other work ends and your begins.

Sometimes a project containing good work is marred by a report, which is turgid, obscure and simply ungrammatical. In such cases, it is very difficult to find out the work done during the project. An examiner cannot be kind enough to look properly on a project that is almost unreadable.

#### **Important points for carrying out a project**

- The organizations or companies offer you a placement for project work out of good will or to get some useful work done. Usually the companies do not provide you everything required by you. You must settle this right in the beginning of the project with the business that what will you get from them and what you have to arrange yourself.
- Some times a complication arises due to the fact that some aspect of your project work is considered confidential by the company. If this is so, it is your responsibility to get whatever clearance is necessary from the organization right in the beginning as essential parts like system analysis and design, flow charts etc. can not be missing from a project report.
- Make sure you allow enough time for writing report. It is strongly recommended that do some writing work as you carry out the project rather than leaving write up until the end. You must allow at least a month to finally write the report. There has to be enough time for the supervisor to read and comment on it and for student to make changes (sometimes extensive) on the basis of the comments. You may have to prepare two or three drafts

before the final submission. Remember that it is mainly the project reports that get examined. An external supervisor receives a pile of project reports written by people who he does not know. If a project produced some software he even may not get time to see it running. In most cases he forms his judgment purely on the basis of the report. Please make your report as readable as possible content wise as well as presentation wise.

1. **Introduction:** This must contain background, any previous work done in the area of your project, your objective and other relevant material that may be helpful to further explain your project work.
2. **The existing system:** The study of the present system; problems in existing system.
3. **System design:** The proposed system; Any specific problem encountered at how you handled them.
4. **Implementation of the system:** Implementation issues and their justification.
5. **Conclusions:** Any shortcoming; your assessment of your work; comparison of your work with similar works; silent features of your work any feature modification. Real times applications of your project work.

References must be given at the end following any standard way of giving references.

For example:

Langdrof, "Theory of Alternating Current Machinery" Tata McGraw Hill, July 2003.

Finally, your project work is your brainchild and nobody knows about it more than you. Be confident to explain your work at the time of viva and be honest to accept any short falls.

### **The Project Report Details**

The report should be prepared with the Word Processing software. They should be printed on A4 size (Executive Bond) paper. A margin of 1.5 inches must be allowed on left hand side for binding. The pages should be numbered. The report should be typed in the 12-font size with vertical spacing of 1.5. **You must submit three copies of your Project Report in between the dates designated by the University positively alongwith a brief Bio –Data of the Supervisor.**

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**COURSE STRUCTURE & SYLLABUS OF  
MASTER OF TECHNOLOGY (M.TECH)**

*In*

**Computer**

**Course Structure**

**Second Year**

**Fourth Semester**

**SPECIALIZATION – 1**

<b>Specialization 1</b>	<b>OBJECT ORIENTED SOFTWARE DEVELOPMENT &amp; DATABASE SYSTEM</b>
<b>Paper Code</b>	<b>Subject</b>
MSDB 01	Java 2 Programming
MSDB 02	Oracle 9i Database
MSDB 03	Database : Design Development and Deployment
MS 04	Project

**SPECIALIZATION 1 : OBJECT ORIENTED SOFTWARE DEVELOPMENT & DATABASE SYSTEM**

***MSDB 01 : JAVA 2 PROGRAMMING***

***Introduction to computers and programming languages, Introduction to object-Oriented Programming and Software development, Java programming basics, Numerical Data, Defining Instantiable classes, Selection statements, repetition statements, Event driven Programming and GUI, Exception Handling, Characters and Strings, Arrays, Sorting and searching, File Input and Output, Inheritance and polymorphism, Swing Classes, Recursive algorithms, JAVA AWT, JFC, Networking, java bean components, java RMI, and security and cryptography, Multitier Enterprise Applications, JDBC & SQL, JAVA serve lets, JSB and EJP.***

**MSDB02-Oracle 10G Database**

- **Installation, Server Configuration and Database Upgrades.**  
Installation new features support, Performance enhancements to the installation process, simplified instance configuration, Viewing Database feature usage statistics, supported upgrade paths to Oracle Database 10gm, using a new mode when upgrading
- **Loading and unloading Data**  
Introduction to the data pump architecture, using data pump export and import, monitoring a data pump job, creating external tables for data population, Defining external table properties, transporting table spaces across different platforms.
- **Automatic Database Management**  
Using the automatic database diagnostic monitor (ADDM), Using Automatic shared memory management, using automatic optimizer statistics collection, Using Automatic undo retention tuning.
- **Manageability infrastructure**  
Types of Oracle Statistics, The automatic workload repository(AWR), active session History, Server – Generated Alerts, Server Generated Alerts, The automated tasks feature, The management advisory framework
- **Application tuning**  
Using the new optimizer statistics, using the SQL tuning advisor, using the SQL Access Advisor, Using the performance pages of the database control.
- **Space and storage management enhancements**  
Proactive Table space management, claiming unused space, using the undo and redo log file size advisors, table space enhancements, using sorted hash clusters, copying files using the database server.
- **The oracle scheduler and the database resource manager**  
Simplifying management tasks using the scheduler, Managing the basic scheduler components, managing advanced scheduler components, viewing information about the scheduler, database resource manager enhancements.
- **Backup and recovery enhancements**  
Using the flash recovery area, using incremental backups, enhanced RMAN Commands, Miscellaneous Backup and recovery enhancements.
- **Flashback Technology Enhancements**

General flashback technology considerations, flashback database, flashback Drop, Flashback Table, Row Level Flashback Features.

- **Automatic storage management**

Introduction to Automatic storage Management, managing the ASM instance, Managing ASM Disk Groups, Managing ASM Files, Migrating a Database to ASM.

- **Enhancements in Analytical SQL and materialized views.**

Enhancements in the MERGE statements, Enhancements in managing multitude environments, SQL and PL/SQL Enhancements, Miscellaneous Enhancements.

### **MSDB 03 : Databases: Design Development and Deployment**

Database vocabulary, concepts and design tools, normalizing the database table structures, The POS Database design process, implementing the database design, queries, form development, reports and labels, macros and macro groups, Implementing the POS invoice process, Database Security, Access and the Internet .

### **MS 04 : PROJECT**

#### **Project Guidelines :**

#### **Thinking up a Project**

You are expected to come up with your own idea for a project. A wide range of topics is acceptable so long as there is substantial computing content and project is predominantly of a practical, problem-solving nature. You might take up an interest which you already have in your stream of engineering. You may do your project in any reputed organization or a department. Every student is to take up a project individually. The project is a vehicle for you to demonstrate the required level of competence in your chosen field of Masters.

Start thinking about your project right in the beginning. If you want to do the project in industrial environment start your correspondence fairly early to find an organization, which is ready to accept you You must submit an outline of your project (two or three pages) to your guide within one month of start of the project work. This must include the Title, Objective, Methodology (main steps to carry out a project), expected output and organization where you intend to carry out the project.

#### **Arranging a Guide**

When you have an idea of your project, even a tentative one, approach a suitable person who has interest and expertise in that area. The Guide may be a person with M.E. / M.Tech with a five-year working experience or a B.E./ B.Tech having a working experience of fifteen years in relevant field.

### **with the Guide**

The Guide's role is to provide support and encouragement to direct the student's attention to relevant literature, to provide technical assistance occasionally, to read and comment on the draft report and to give guidance on the standard and amount of work required. The Guide is not responsible to teach any new skills and language required for project work or for arranging any literature or equipment. You are expected to meet at least once a month to your Guide. Rest you can workout your own arrangement. The students, who are content to carry out their work largely without supervision, should keep their Guide in touch with what they are doing. A student should not remain silent for months and then appear with a complete project work unknown to supervisor. In such circumstances, the Guide cannot be counted on to give an automatic seal of his approval. If a project produces a piece of software, the Guide would normally expect to see a demonstration of the software in action.

The main purpose of the report is to explain what you did in your project. The reader should be able to see clearly what you set out to do and what you achieved. It should describe the problem addresses and explain why you tackled it in the way you did. It should include your own assessment of how successful the project was.

Resist temptation to include pages of padding. If the project consists of developing an application in area with which a computer scientist would not be familiar – such as chemical testing, stock & shares – it might be necessary to include some explanatory company/ organization profile for whom you have done the work must not appear in chapters and must go to appendix part.

The work that is presented for examiners should be your own. The presentation of another person's work, design or program as though they are your own is a serious examination offence. Direct quotation from the work of others (published or un published) must always be clearly identified as such by being placed in quotation marks, it is essential that reader should be able to see where the other work ends and your begins.

Sometimes a project containing good work is marred by a report, which is turgid, obscure and simply ungrammatical. In such cases, it is very difficult to find out the work done during the project. An examiner cannot be kind enough to look properly on a project that is almost unreadable.

### **Some important points for carrying out a project**

- The organizations or companies offer you a placement for project work out of good will or to get some useful work done. Usually the companies do not provide you everything required by you. You must settle this right in the beginning of the project with the business that what will you get from them and what you have to arrange yourself.

- Some times a complication arises due to the fact that some aspect of your project work is considered confidential by the company. If this is so, it is your responsibility to get whatever clearance is necessary from the organization right in the beginning as essential parts like system analysis and design, flow charts etc. can not be missing from a project report.
- Make sure you allow enough time for writing report. It is strongly recommended that do some writing work as you carry out the project rather than leaving write up until the end. You must allow at least a month to finally write the report. There has to be enough time for the supervisor to read and comment on it and for student to make changes (sometimes extensive) on the basis of the comments. You may have to prepare two or three drafts before the final submission. Remember that it is mainly the project reports that get examined. An external supervisor receives a pile of project reports written by people who he does not know. If a project produced some software he even may not get time to see it running. In most cases he forms his judgment purely on the basis of the report. Please make your report as readable as possible content wise as well as presentation wise.

6. **Introduction:** This must contain background, any previous work done in the area of your project, your objective and other relevant material that may be helpful to further explain your project work.
7. **The existing system:** The study of the present system; problems in existing system.
8. **System design:** The proposed system; Any specific problem encountered at how you handled them.
9. **Implementation of the system:** Implementation issues and their justification.
10. **Conclusions:** Any shortcoming; your assessment of your work; comparison of your work with similar works; silent features of your work any feature modification. Real times applications of your project work.

References must be given at the end following any standard way of giving references.

For example:

Langdrof, "Theory of Alternating Current Machinery" Tata McGraw Hill, July 2003.

Finally, your project work is your brainchild and nobody knows about it more than you. Be confident to explain your work at the time of viva and be honest to accept any short falls.

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