**AFFILIATED INSTITUTIONS**

**ANNA UNIVERSITY, CHENNAI**

**REGULATIONS - 2009**

**CURRICULUM I SEMESTER (FULL TIME)**

# M.Tech. MULTIMEDIA TECHNOLOGY

**SEMESTER I**

| SL. NO | COURSE CODE | COURSE TITLE | L | T | P | C |
|---|---|---|---|---|---|---|
| **THEORY** | | | | | | |
| 1 | MA9327 | Optimization Techniques | 3 | 1 | 0 | 4 |
| 2 | MU9311 | Data Structures and Algorithms | 3 | 0 | 0 | 3 |
| 3 | MU9312 | Principles of Multimedia | 3 | 0 | 0 | 3 |
| 4 | MU9313 | Advanced Computer Architecture | 3 | 0 | 0 | 3 |
| 5 | MU9314 | Multimedia Communication and Networks | 3 | 0 | 0 | 3 |
| **PRACTICAL** | | | | | | |
| 6 | MU9315 | Multimedia Tools Laboratory | 0 | 0 | 3 | 2 |
| | | **TOTAL** | **15** | **1** | **3** | **18** |

**MA9327 OPTIMIZATION TECHNIQUES L T P C**
**3 1 0 4**

**1. 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.

**2. NON LINEAR PROGRAMMING (12)**

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

**3. INTEGER PROGRAMMING (12)**

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

**4. DYNAMIC PROGRAMMING (12)**

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

**5. 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**

**REFERNCES:**


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.

**MU9311 DATA STRUCTURE AND ALGORITHM L T P C**
**3 0 0 3**

**1. INTRODUCTION** (8)

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

**2. 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

**3. 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

**4. 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

**5. 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.

**MU9312 PRINCIPLES OF MULTIMEDIA L T P C**
**3 0 0 3**

**I INTRODUCTION 7**

Introduction to Multimedia – Characteristics – Utilities – Creation -Uses – Promotion – Digital Representation – Media and Data streams – Multimedia Architecture – Multimedia Documents

**2 ELEMENTS OF MULTIMEDIA 11**

Text : types – font - Unicode standard - text compression - file formats. – Image: types - image processing – standards - specification - device independent color models - gamma correction - file formats – Video :video signal transmission - signal formats - broadcasting standards - digital video standards - PC video - video file formats – Audio : acoustics - characteristics of sound - elements of audio system – microphone – amplifier – loudspeaker - audio mixer - digital audio - MIDI – Graphics – components of graphics system, co-ordinate system – plotter - Intro to 2D & 3D Graphics -surface characteristics and texture - lights – Animation :key frames & Tweening, techniques, principles of animation, 3D animation, file formats.

**3 MULTIMEDIA SYSTEMS 9**

Visual Display Systems – CRT - video adapter card - video adapter cable – LCD – PDP - optical storage media - CD technology - DVD Technology - Compression Types and Techniques – CODEC - GIF coding standards - lossy and lossless – JPEG - MPEG-1 - MPEG-2 - MP3 - Fractals – MMDBS

**4 MULTIMEDIA TOOLS 9**

Authoring tools – features and types - card and page based tools - icon and object based tools - time based tools - cross platform authoring tools - Editing tools - text editing and word processing tools - OCR software - painting and drawing tools - 3D modeling and animation tools - image editing tools -sound editing tools - digital movie tools – plug -ins and delivery vehicles for www

**5 MULTIMEDIA APPLICATION DEVELOPMENT 9**

Software life cycle – ADDIE Model – conceptualization – content collection and processing – story – flowline – script - storyboard - implementation - multiplatform issues – authoring – metaphors – testing – report writing - documentation - case study: -Web Application – Console Application – Distributed Application – Mobile Application - games consoles – iTV – kiosks – education

**TOTAL = 45**

**TEXT BOOKS**

1. Parekh R “Principles Of Multimedia” Tata McGraw-Hill, 2006.
2. Ralf Steinmetz, Klara Nahrstedt, “Multimedia: Computing, Communications and Applications” Prentice Hall, 1995.

**REFERENCES**

1. Tay Vaughan, “Multimedia: Making It Work” McGraw-Hill Professional, 2006
2. Deitel & Deitel “Internet & World Wide Web How to Program”, Fourth Edition – Prentice Hall, 2008.

**MU9313 ADVANCED COMPUTER ARCHITECTURE**

| L | T | P | C |
|---|---|---|---|
| 3 | 0 | 0 | 3 |

**1 PIPELINING AND ILP** **9**

Fundamentals of Computer Design - Measuring and Reporting Performance - Instruction Level Parallelism and Its Exploitation - Concepts and Challenges - Overcoming Data Hazards with Dynamic Scheduling – Dynamic Branch Prediction - Speculation - Multiple Issue Processors – Case Studies.

**2 ADVANCED TECHNIQUES FOR EXPLOITING ILP** **9**

Compiler Techniques for Exposing ILP - Limitations on ILP for Realizable Processors - Hardware versus Software Speculation - Multithreading: Using ILP Support to Exploit Thread-level Parallelism - Performance and Efficiency in Advanced Multiple Issue Processors - Case Studies.

**3 MULTIPROCESSORS** **9**

Symmetric and distributed shared memory architectures – Cache coherence issues - Performance Issues – Synchronization issues – Models of Memory Consistency - Interconnection networks – Buses, crossbar and multi-stage switches.

**4 MULTI-CORE ARCHITECTURES** **9**

Software and hardware multithreading – SMT and CMP architectures – Design issues – Case studies – Intel Multi-core architecture – SUN CMP architecture – IBM cell architecture.- hp architecture.

**5 MEMORY HIERARCHY DESIGN** **9**

Introduction - Optimizations of Cache Performance - Memory Technology and Optimizations - Protection: Virtual Memory and Virtual Machines - Design of Memory Hierarchies - Case Studies.

**TOTAL - 45**

**REFERENCES**


1. John L. Hennessey and David A. Patterson, " Computer Architecture – A quantitative approach", Morgan Kaufmann / Elsevier, 4th. edition, 2007.
2. David E. Culler, Jaswinder Pal Singh, "Parallel Computing Architecture : A hardware/ software approach" , Morgan Kaufmann / Elsevier, 1997.
3. William Stallings, " Computer Organization and Architecture – Designing for Performance", Pearson Education, Seventh Edition, 2006.

**MU9314 MULTIMEDIA COMMUNICATION AND NETWORKS**

**L T P C**
**3 0 0 3**

**1` IP NETWORKS 9**

Open Data Network Model – Narrow Waist Model of the Internet - Success and Limitations of the Internet – Suggested Improvements for IP and TCP – Significance of UDP in modern Communication – Network level Solutions – End to End Solutions - Best Effort service model – Scheduling and Dropping policies for Best Effort Service model

**2 ADVANCED ROUTING 9**

Intra AS routing – Inter AS routing – Router Architecture – Switch Fabric – Active Queue Management – Head of Line blocking – Transition from IPv4 to IPv6 – Multicasting – Abstraction of Multicast groups – Group Management – IGMP – Group Shared Multicast Tree – Source based Multicast Tree – Multicast routing in Internet – DVMRP and MOSPF – PIM – Sparse mode and Dense mode

**3 GUARANTEED SERVICE MODEL 9**

Best Effort service model – Scheduling and Dropping policies – Network Performance Parameters – Quality of Service and metrics – WFQ and its variants – Random Early Detection – QoS aware Routing – Admission Control – Resource Reservation – RSVP -Traffic Shaping Algorithms – Caching – Laissez Faire Approach - Possible Architectures – An Overview of QoS Architectures

**4 MULTIMEDIA COMMUNICATION 9**

Stream characteristics for Continuous media – Temporal Relationship – Object Stream Interactions, Media Levity, Media Synchronization – Models for Temporal Specifications – Streaming of Audio and Video – Jitter – Fixed playout and Adaptive playout – Recovering from packet loss – RTSP –– Multimedia Communication Standards – RTP/RTCP – SIP and H.263

**5 WIRELESS MULTIMEDIA COMMUNICATION 9**

End to End QoS provisioning in Wireless Multimedia Networks – Adaptive Framework – MAC layer QoS enhancements in Wireless Networks – A Hybrid MAC protocol for Multimedia Traffic – Call Admission Control in Wireless Multimedia Networks – A Global QoS Management for Wireless Networks

**REFERENCES**


1. Jean Warland and Pravin Vareya, ‘High Performance Networks’, Morgan Kauffman Publishers, 2002
2. Mahbub Hassan and Raj Jain, ‘High Performance TCP/IP Networking’, Pearson Education, 2004.
3. William Stallings, ‘High Speed Networks: Performance and Quality of Service’, 2nd Edition, Pearson Education, 2002.
4. Kurose and Ross, ‘Computer Networks : A top down Approach’, Pearson Education, 2002
5. Nalin K Sharda, ‘Multimedia Information Networking’, Prentice Hall of India, 1999
6. Aura Ganz, Zvi Ganz and Kitti Wongthawaravat, ‘Multimedia Wireless Networks: Technologies, Standards and QoS’, Prentice Hall, 2003.
7. Ellen Kayata Wesel, ‘Wireless Multimedia Communications: Networking Video, Voice and Data’, Addision Wesley, 1998

**MU9315 MULTIMEDIA TOOLS LABORATORY**

| L | T | P | C |
|---|---|---|---|
| 0 | 0 | 3 | 2 |

1. Video editing
2. Audio editing
3. Image editing
4. 2D animation
5. 3D animation
6. HTML/Frontpage/Dreamweaver