

**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
<b>THEORY</b>						
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
<b>PRACTICAL</b>						
6	MU9315	Multimedia Tools Laboratory	0	0	3	2
<b>TOTAL</b>			<b>15</b>	<b>1</b>	<b>3</b>	<b>18</b>

- 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.

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 ", 2<sup>nd</sup> 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.

<b>I</b>	<b>INTRODUCTION</b>	<b>7</b>
	Introduction to Multimedia – Characteristics – Utilities – Creation -Uses – Promotion – Digital Representation – Media and Data streams – Multimedia Architecture – Multimedia Documents	
<b>2</b>	<b>ELEMENTS OF MULTIMEDIA</b>	<b>11</b>
	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.	
<b>3</b>	<b>MULTIMEDIA SYSTEMS</b>	<b>9</b>
	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	
<b>4</b>	<b>MULTIMEDIA TOOLS</b>	<b>9</b>
	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	
<b>5</b>	<b>MULTIMEDIA APPLICATION DEVELOPMENT</b>	<b>9</b>
	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.

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|----------|--|----------|
| <b>1</b> | <b>PIPELINING AND ILP</b>  | <b>9</b> |
|          | 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. |          |
| <b>2</b> | <b>ADVANCED TECHNIQUES FOR EXPLOITING ILP</b>  | <b>9</b> |
|          | 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.        |          |
| <b>3</b> | <b>MULTIPROCESSORS</b>   | <b>9</b> |
|          | 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.   |          |
| <b>4</b> | <b>MULTI-CORE ARCHITECTURES</b>  | <b>9</b> |
|          | Software and hardware multithreading – SMT and CMP architectures – Design issues – Case studies – Intel Multi-core architecture – SUN CMP architecture – IBM cell architecture.- hp architecture.  |          |
| <b>5</b> | <b>MEMORY HIERARCHY DESIGN</b>   | <b>9</b> |
|          | 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, 4<sup>th</sup>. 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.

- 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', 2<sup>nd</sup> 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', Addison Wesley, 1998

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