NIMS UNIVERSITY, JAIPUR

SYLLABUS

M. TECH.
# (COMPUTER SCIENCE)

## SEMESTER - I

**Teaching and Examination Scheme**

<table>
<thead>
<tr>
<th>Sr. NO.</th>
<th>Course No.</th>
<th>Title</th>
<th>L</th>
<th>T</th>
<th>P</th>
<th>CW*</th>
<th>Exam.</th>
<th>Total</th>
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<tbody>
<tr>
<td>1</td>
<td>1MTCS1</td>
<td>Advanced Data Structure</td>
<td>2</td>
<td>1</td>
<td></td>
<td>25</td>
<td>100</td>
<td>100</td>
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<tr>
<td>2.</td>
<td>1MTCS2</td>
<td>Information System Security</td>
<td>2</td>
<td>1</td>
<td></td>
<td>25</td>
<td>100</td>
<td>100</td>
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<tr>
<td>3.</td>
<td>1MTCS3</td>
<td>Advanced Computer Networks</td>
<td>2</td>
<td>1</td>
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<td>4.</td>
<td>1MTCS4</td>
<td>Modern Compiler Design</td>
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<td>1</td>
<td></td>
<td>25</td>
<td>100</td>
<td>100</td>
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<td><strong>TOTAL</strong></td>
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<td>8</td>
<td>4</td>
<td></td>
<td>100</td>
<td>400</td>
<td>500</td>
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CW*->Course Work
1MTCS1: Advanced Data Structures

Course No.: 1MTCS1  
Course Title: Advanced Data Structure  
L-T-P Structure: 2-1-0  
Maximum Marks Theory: 100


Reference:

1. Motwani and Raghavan "Randomized Algorithms", Cambridge University Press  
2. Preparata and Shamos "Computational Geometry", Springer Verlag  
3. Mehlhorn "Data Structures and Algorithms: 1, Searching and Sorting", Springer Verlag EATCP  
4. Monograph on Theoretical Computer Science  
5. Papadimitrou and Steiglitz "Combinatorial Optimization", Princeton University  
6. PHI, Cormen

1MTCS2 Information System Security

Course No.: 1MTCS2  
Course Title: Information System Security  
L-T-P Structure: 2-1-0  
Maximum Marks Theory: 100

Multi level model of security, Cryptography, Secret Key Cryptography, Modes of Operation, Hashes and Message Digest, Public Key Algorithm, Security Handshake Pitfall, Strong Password Protocol; Case study of real time communication security; Introduction to the Concepts of Security, Security Approaches, Principles of security, Types of attacks; Cryptographic Techniques: Plain text and Cipher text, Substitution Techniques, Transposition Techniques Encryption and Decryption, Symmetric and Asymmetric Key Cryptography, Computer-based symmetric Key Cryptographic; Algorithms: Algorithm Types and Modes, An Overview of Symmetric Key Cryptography, Data Encryption Standard

Reference:

2. Charlie Kaufman, Radia Perlman, Mike Speciner "Network Security" Pearson,
3. J. A. Coopeer "Computer Communication Securities"TMH,
4. D.W. Davies W. L. Price "Securities For computer Networks"

1MTCS 3: Advanced Computer Networks

Course No.: 1MTCS 3 Course Title: Advanced Computer Networks
L-T-P Structure: 2-1-0 Maximum Marks Theory: 100

OSI Application Layer Service Elements-e.g. FTAM, virtual terminal protocol, X.400 message handling. Network Services and Applications-X.500 directory services, information retrieval, online transaction processing, electronic mail, conferencing and EDI. Protocols-Routing and switching protocols functions, design, implementation and testing. RIP version 1 & 2, VLAN, STP, Architectures, Standards and Protocols-TCP OSI/IP, connectionless and connection-oriented protocols, protocol stacks. Network Design, Performance, Operation and

Reference:


1MTCS4: Modern Compiler Design

Course No.: 1MTCS 4  
Course Title: Software System Design  
L-T-P Structure: 2-1-0  
Maximum Marks Theory: 100

Introduction to Advanced Topics of Informal Compiler Algorithm Notation (ICAN), Control-Flow Analysis ,Data-Flow Analysis, Dependence Analysis and Dependence Graphs, Alias Analysis, Introduction to Optimization, Redundancy Elimination, Loop Optimizations, Procedure Optimizations, Case Studies of Compilers and Future Trends.

Suggested reference materials:  
2. Holob "Compiler Designing" TMH

### SEMESTER - II

<table>
<thead>
<tr>
<th>Sr. NO.</th>
<th>Course No.</th>
<th>Title</th>
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<tbody>
<tr>
<td>1</td>
<td>2MTCS1</td>
<td>Advanced Database Management Systems</td>
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<tr>
<td>2</td>
<td>2MTCS2</td>
<td>Design of Embedded Systems</td>
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<tr>
<td>3</td>
<td>2MTCS3</td>
<td>Distributed Algorithms</td>
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<td>4</td>
<td>2MTCS5</td>
<td>Advanced Real-Time System Design</td>
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### SEMESTER – III

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<tr>
<td>1</td>
<td>3MTCS1</td>
<td>Parallel and Distributed Computing</td>
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<tr>
<td>2</td>
<td>3MTCS2</td>
<td>Artificial Intelligence &amp; Fuzzy Systems</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Course Work / Presentation/ Dissertation Part-1</td>
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### SEMESTER – IV

<table>
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<th>Title</th>
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<tbody>
<tr>
<td>1</td>
<td>4MTCS1</td>
<td>Dissertation Part-II</td>
</tr>
<tr>
<td>2</td>
<td>4MTCS2</td>
<td>Project / Presentation</td>
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</tbody>
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