

**Syllabi & Scheme of Examination**  
**Under Choice Based Credit System**

**MASTER OF TECHNOLOGY (Week-End )**  
**COMPUTER SCIENCE AND ENGINEERING**


Department of Computer Science and Applications  
**Chaudhary Devi Lal University, Sirsa**

Department of Computer Science & Engineering  
 Chaudhary Devi Lal University, Sirsa (Haryana)  
 Scheme & Syllabi of Examination for  
 Master of Technology in Computer Science & Engineering  
 (M. Tech. CSE Week End)  
 under Choice Based Credit System

SEMESTER-I	L/T	P	Credit	Int	Ext
MT-PT-11 Advanced Computer Architecture	4	-	4	30	70
MT-PT-12 Advanced Database Systems	4	-	4	30	70
MT-PT-13 Lab-I (Based on MT-PT-12)	-	4	2	20	30
MT-PT-14 Seminar	2	-	2	50	-
<b>Total</b>			<b>12</b>	<b>130</b>	<b>170</b>

SEMESTER-II	L/T	P	Credit	Int	Ext
MT-PT-21 Big Data Analytics	4	-	4	30	70
MT-PT-22 Advanced Operating System	4	-	4	30	70
MT-PT-23 Lab-II (Based on MT-PT-22)	-	4	2	20	30
MT-PT-24 Seminar	2	-	2	50	-
<b>Total</b>			<b>12</b>	<b>130</b>	<b>170</b>

  
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# MT-PT-11 Advanced Computer Architecture

L/T	P	Credit	Int	Ext
4	-	4	30	70

Note:- Total 09 Questions are to be set by the examiner. First question will be compulsory consisting of 5 short (each 2 marks) questions covering entire syllabus uniformly. In addition 8 more questions will be set unit wise comprising 2 questions from each unit of the given syllabus. A candidate is required to attempt five questions in all selecting one question from each unit including the compulsory question.

**Unit-I**  
Computational model, The concept of Computer Architecture, Introduction to Parallel Processing

**Unit-II**  
Introduction to LLP Processors, Pipelined Processors, VLIW Architecture, Super Scalar Processors

**Unit-III**  
Processing of Control transfer instruction, Code Scheduling for LLP-processors, Introduction to Data Parallel Architecture, SIMD Architecture, MIMD Architecture

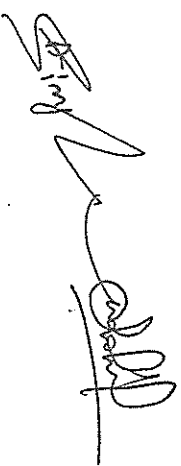
**Unit-IV**  
Vector Architecture, Multi threaded Architecture, Distributed Memory MIMD Architecture Shared memory MIMD Architecture.

### Reference:

1. Dezsosima, Terence Fountani, Peter Kacsuie, "Advanced Computer Architectures: A Design Space Approach, 1/e, Pearson Education."
2. Computer Architecture by Stone

  
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#### Unit-I

Introduction of DBMS, types of DBMS and their advantages and disadvantages  
 Introduction of RDBMS, types of relational query language, Normalization, Query optimization  
 Database protection in RDBMS – Integrity, Concurrency control, Recovery

#### Unit-II

Distributed Databases: concepts, structure, trade-offs  
 Methods of data distribution – fragmentation, replication, design & advance concepts of DDBMS  
 Introduction to object oriented databases .Deductive databases

#### Unit-III





Data warehousing Concepts: Architecture, Dataflows, Tools & Technologies, Data Marts, Data Mining & Online Analytical Processing

#### Unit-IV

Spatial & Multimedia databases. Mobile Computing & Mobile Databases

#### References:

- 1) Elmasri, Navathe, "Fundamentals of Database Systems", Pearson Education.
- 2) Henry F. Korth, A Silberschatz, "Database Concepts", Tata McGraw Hill.
- 3) Thomas Connolly, Carolyn Begg, "Database Systems", Pearson Education.
- 4) Alexis Leon, Mathews Leon, "Database Management Systems".
- 5) C.J.Date, "An Introduction to DBMS", Narosa Publishing House.

  
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#### UNIT I

Introduction to Big Data, Introduction – distributed file system – Big Data and its importance, Four Vs, Drivers for Big data, Big data analytics, Big data applications. Algorithms using map reduce, Matrix-Vector Multiplication by Map Reduce. Introduction of HADOOP, Big Data – Apache Hadoop & Hadoop Ecosystem – Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce - Data Serialization.

#### UNIT- II

HADOOP ARCHITECTURE - Hadoop Architecture, Hadoop Storage: HDFS, Common Hadoop Shell commands , Anatomy of File Write and Read, NameNode, Secondary NameNode, and DataNode, Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Task trackers - Cluster Setup – SSH & Hadoop Configuration – HDFS Administering – Monitoring & Maintenance.

#### UNIT III

BIG DATA PRIVACY, ETHICS AND SECURITY - Privacy – Reidentification of Anonymous People – Why Big Data Privacy is self regulating?, Ethics – Ownership – Ethical Guidelines – Big Data Security – Organizational Security

#### UNIT IV

SECURITY, COMPLIANCE, AUDITING, AND PROTECTION- Steps to secure big data – Classifying Data – Protecting – Big Data Compliance – Intellectual Property Challenge – Research Questions in Cloud Security – Open Problems, HADOOP SECURITY DESIGN Kerberos – Default Hadoop Model without security - Hadoop Kerberos Security Implementation & Configuration, DATA SECURITY & EVENT LOGGING Integrating Hadoop with Enterprise Security Systems - Securing Sensitive Data in Hadoop – SIEM system – Setting up audit logging in hadoop cluster.

#### REFERENCES:

1. Mark Van Rijmenam, "Think Bigger: Developing a Successful Big Data Strategy for Your Business", Amazon, 1 edition, 2014.
2. Frank Ohlhorst John Wiley & Sons, "Big Data Analytics: Turning Big Data into Big Money", John Wiley & Sons, 2013.
3. SherifSakr, "Large Scale and Big Data: Processing and Management", CRC Press, 2014.
4. Sudeesh Narayanan, "Securing Hadoop", Packt Publishing, 2013.
5. Ben Spivey, Joey Echeverria, "Hadoop Security Protecting Your Big Data Problem", O'Reilly Media, 2015.
6. Boris Lublinsky, Kevin I. Smith, Alexey Yakubovich, "Professional Hadoop Solutions", Wiley, ISBN: 9788126551071, 2015.
7. Chris Eaton, Dirk deeros et al., "Understanding Big data ", McGraw Hill, 2012. 3. Tom White, "HADOOP: The definitive Guide", O Reilly 2012

  
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**Unit-I**

Security and Protection: Security Threats, Attacks on Security, Security Violation through Parameters, Computer Worms, Computer Viruses, Security Design Principles, Authentication, Protection Mechanism, Encryption, Security in Distributed Environment. Graphical User Interface and the Operating System: Windowing Technology, Graphical User Interface, relationship between Operating System and the Windows, Components of GUI, requirement of a Windows based GUI

**Unit-II**

**Distributed and Parallel Processing:** Parallel Processing, Distributed Processing, Difference between Distributed and Parallel Processing, Advantages of Parallel Processing, Writing Programs for Parallel Processing, Machine Architecture supporting Parallel Processing, Operating System for Parallel Processors, Issues in Operating System in Parallel Processing.

**Unit-III**


**Distributed Operating Systems:** Architecture of Distributed Systems, Networking, Interprocess Communication Protocols, Distributed Computation Paradigm, Network Operating System, Design issues in Distributed Operating System, Theoretical issues in Distributed Systems, Distributed Control Algorithms, Distributed Mutual Exclusion, Distributed Deadlock Handling, Distributed Scheduling Algorithms, Recovery and Fault Tolerance, Distributed File System, Distributed system Security.

**Unit-IV**

**Disk Performance Optimization:** Moving Head Disk Storage, Disk Scheduling, Seek Optimization, Rotational Optimization, Disk Caching. **Processes:** Process Model, Implementation of Processes, Threads, Inter-process Communication, Race Condition, Critical Section, Mutual Exclusion with Busy waiting, Sleep and Wakeup, Semaphores, Monitors, Message Passing. **Classical IPC Problems,** Process Scheduling, Round Robin, Priority, Multiple Queues, Shortest Job First, Guaranteed, Lottery, Real Time and Two-Level Scheduling.

**References:**

1. Operating Systems; Achyut S Godbole; Tata McGraw Hill Publishing Company Limited, New Delhi.
2. Operating Systems; A Concept based Approach; D. M. Dhamdhare; Tata McGraw Hill Publishing Company Limited, New Delhi.
3. Operating Systems-2<sup>nd</sup> Edition; H. M. Deitel; Pearson Education.
4. Operating Systems-Design and Implementation; Andrew S. Tanenbaum, Albert S. Woodhull; Prentice-Hall of India Private Limited, New Delhi.

  
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