M.Sc.-IT-19-I-1016

GAUHATI UNIVERSITY
Institute of Distance and Open Learning

First Semester

(under CBCS)

M.Sc.IT

Paper: INF 1016
ADVANCED CONCEPTS IN OBJECT ORIENTED PROGRAMMING

Contents:

BLOCK I: OBJECT ORIENTED PROGRAMMING

Unit 1 : Introduction to Object Oriented Programming
Unit 2 : Introduction to C++
Unit 3 : Control Statements in C++
Unit 4 : Array and Strings in C++
Unit 5 : Pointers and Reference Variables in C++
Unit 6 : Concept of Function in C++
Unit 7 : Data Abstraction
Unit 8 : Inheritance
Unit 9 : Polymorphism
Unit 10 : Exception Handling
Unit 11 : File Handling

BLOCK II: OBJECT ORIENTED DESIGN

Unit 1 : Introduction to OO Design
Unit 2 : Object Modeling Techniques (OMT) tools
Unit 3 : Phases of Object-Oriented Development

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ISBN:

May, 2022

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Published on behalf of Institute of Distance and Open Learning, Gauhati University by the Director, and printed at Gauhati University Press, Guwahati-781014.

M.Sc.-IT-19-I-1026

GAUHATI UNIVERSITY
Institute of Distance and Open Learning

Semester- I

M.Sc.IT

Paper: INF 1026
ADVANCED COMPUTER ORGANIZATION AND ARCHITECTURE

Contents:

BLOCK I: INSTRUCTION SET ARCHITECTURE AND PROCESSOR DESIGN

Unit 1 : Instruction Set Architecture and Design
Unit 2 : Combinational Circuits and Adders
Unit 3 : Computer Arithmetic
Unit 4 : Register Transfer and Processor Logic Design

BLOCK II: MEMORY AND INPUT OUTPUT ORGANIZATIONS

Unit 1 : Memory Organization
Unit 2 : Cache Memory
Unit 3 : Virtual Memory and Paging
Unit 4 : Basic Input Output System-I
Unit 5 : Basic Input Output System-II

BLOCK III: ADVANCED CONCEPTS OF PARALLEL ARCHITECTURES

Unit 1 : Basic Parallel Architecture and Instruction Pipeline
Unit 2 : Vector Processing
Unit 3 : Advanced Concepts of Computer Architecture Implicit Parallelism
Unit 4 : Advanced Concepts of Pipeline scheduling
Unit 5 : Advanced CPU Architecture

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Published on behalf of Institute of Distance and Open Learning, Gauhati University by the Director, and printed at Gauhati University Press, Guwahati-781014.

M.Sc.-IT-19-I-1036

GAUHATI UNIVERSITY
Institute of Distance and Open Learning

First Semester

(under CBCS)

M.Sc.IT

Paper: INF 1036
OPERATING SYSTEM

Contents:

BLOCK I: REVIEW OF COMPUTER ORGANIZATION, MEMORY ARCHITECTURE, CONCURRENT PROCESS AND SCHEDULING

Unit 1 : Computer System Review
Unit 2 : Operating System(OS) Overview
Unit 3 : Introduction to Linux
Unit 4 : Process Management
Unit 5 : System Calls
Unit 6 : Process Scheduling Algorithms I
Unit 7 : Process Scheduling Algorithms II
Unit 8 : Concurrent Process Management

BLOCK II: MEMORY AND I/O MANAGEMENT, SYSTEM DEADLOCK AND MULTIPROGRAMMING SYSTEM

Unit 1 : Memory Management
Unit 2 : I/O Organization
Unit 3 : Introduction to System Deadlock
Unit 4 : Deadlock Prevention, Detection and Avoidance
Unit 5 : Multiprogramming System
Unit 6 : Secondary Storage Management
Unit 7 : Security
Unit 8 : Distributed Operating Systems

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Published on behalf of Institute of Distance and Open Learning, Gauhati University by the Director, and printed at Gauhati University Press, Guwahati-781014.

M.Sc.-IT-19-I-1046

GAUHATI UNIVERSITY
Institute of Distance and Open Learning

First Semester

M.Sc.IT

(under CBCS)

Paper: INF 1046

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Contents:

BLOCK I: DISCRETE MATHEMATICAL STRUCTURES AND MATHEMATICAL LOGIC

Unit 1 : Combinatorics
Unit 2 : Sets
Unit 3 : Relations
Unit 4 : Boolean Algebra
Unit 5 : Algebraic Structures
Unit 6 : Propositional Calculus I
Unit 7 : Propositional Calculus II
Unit 8 : Predicate Calculus

BLOCK II: GRAPH THEORY

Unit 1 : Introduction to Graph
Unit 2 : Paths and Circuits I
Unit 3 : Paths and Circuits II
Unit 4 : Trees
Unit 5 : Graph Representation

BLOCK III: AUTOMATA THEORY

Unit 1 : Introduction to Language and Grammar
Unit 2 : Introduction to Finite Automata
Unit 3 : Regular Sets and Regular Expressions
Unit 4 : Context Free Language
Unit 5 : Normal Forms of CFLs

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ISBN:

May, 2022

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Published on behalf of Institute of Distance and Open Learning, Gauhati University by the Director, and printed at Gauhati University Press, Guwahati-781014.

M.Sc.-IT-19-I-1056

GAUHATI UNIVERSITY
Institute of Distance and Open Learning

First Semester

(under CBCS)

M.Sc.IT

Paper: INF 1056

ADVANCED DATABASE MANAGEMENT SYSTEM

Contents:

BLOCK I: RELATIONAL MODEL CONCEPTS, LANGUAGES, DESIGN THEORY AND METHODOLOGY

Unit 1 : Relational Data Model and Relational Database Constraints
Unit 2 : Relational Algebra and Relational Calculus
Unit 3 : Structured Query Language I
Unit 4 : Structured Query Language II
Unit 5 : Semantic Modelling
Unit 6 : Normalization and Functional Dependencies

BLOCK II: DATABASE QUERY, TRANSACTION PROCESSING AND SECURITY CONCEPTS

Unit 1 : Query Processing and Optimization
Unit 2 : Transaction Processing
Unit 3 : Concurrency Control and Recovery Techniques
Unit 4 : Database Security

BLOCK III: INTRODUCTION TO OBJECT ORIENTED, DISTRIBUTED, MULTIMEDIA AND SPATIAL DATABASES

Unit 1 : Object Oriented Database System
Unit 2 : Distributed Databases
Unit 3 : Image and Multimedia Database
Unit 4 : Spatial Database

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May, 2022

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Published on behalf of Institute of Distance and Open Learning, Gauhati University by the Director, and printed at Gauhati University Press, Guwahati-781014.

M.Sc.-IT-19-II-2016

GAUHATI UNIVERSITY
Institute of Distance and Open Learning

SECOND SEMESTER

(under CBCS)

M.Sc.- IT

Paper: INF 2016

DATA COMMUNICATION AND COMPUTER NETWORKS

Contents:

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Unit 2 : Types of Computer Networks
Unit 3 : Network Standards
Unit 4 : The Physical Layer: Introduction to Data Communication
Unit 5 : The Physical Layer: Transmission Media
Unit 6 : The Physical Layer: Transmission Modes

BLOCK II: THE DATA LINK LAYER, LAN, WIRELESS LAN

Unit 1 : The Data Link Layer: Design Issues
Unit 2 : The Data Link Layer: The Protocols
Unit 3 : The MAC Sub Layer
Unit 4 : The Local Area Network (LAN)
Unit 5 : The Wireless LAN

BLOCK III: THE NETWORK, TRANSPORT AND APPLICATION LAYERS

Unit 1 : The Network Layer: Design Issues
Unit 2 : The Network Layer: Routing
Unit 3 : The Network Layer: The Internet
Unit 4 : The Transport Layer: The Service
Unit 5 : The Transport Layer: The Protocols
Unit 6 : The Application Layer
Unit 7 : Network Management and Security

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ISBN:

May, 2022

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Published on behalf of Institute of Distance and Open Learning, Gauhati University by the Director, and printed at Gauhati University Press, Guwahati-781014.

M.Sc.-IT-19-II-2026

GAUHATI UNIVERSITY
Institute of Distance and Open Learning

SECOND SEMESTER

(under CBCS)

M.Sc.- IT

Paper: INF 2026
ALGORITHMS AND COMPLEXITY THEORY

Contents:

BLOCK I: ANALYSIS OF ALGORITHMS
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Unit 2 : Asymptotic notations I
Unit 3 : Asymptotic notations II
Unit 4 : Recurrences
Unit 5 : Amortized Analysis

BLOCK II: ALGORITHM DESIGN TECHNIQUES
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Unit 2 : Algorithm Design Techniques II
Unit 3 : Overview of More Algorithm Design Techniques

BLOCK III: GRAPH ALGORITHMS
Unit 1 : Introduction to Graph
Unit 2 : Minimum Spanning Tree
Unit 3 : Single Source Shortest Path Problem

BLOCK IV: THEORY OF NP COMPLETENESS AND LOWER BOUND THEORY
Unit 1 : Theory of NP Completeness I
Unit 2 : Theory of NP Completeness II
Unit 3 : Lower Bound Theory

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May, 2022

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M.Sc.-IT-19-II-2036

GAUHATI UNIVERSITY
Institute of Distance and Open Learning

SECOND SEMESTER

(under CBCS)

M.Sc.- IT

Paper: INF 2036

SOFTWARE ENGINEERING

Contents:

BLOCK I: FUNDAMENTALS OF SOFTWARE ENGINEERING AND SOFTWARE DESIGN

Unit 1 : Introduction to Software Engineering
Unit 2 : Software Process Models
Unit 3 : Software Requirements and Analysis
Unit 4 : Software Project Planning
Unit 5 : Software Decomposition and Cost Estimation Techniques
Unit 6 : Software Design I
Unit 7 : Software Design II
Unit 8 : Software Design III

BLOCK II: SOFTWARE CODING, TESTING AND MAINTENANCE

Unit 1 : Software Coding
Unit 2 : Software Testing I
Unit 3 : Software Testing II
Unit 4 : Software Maintenance
Unit 5 : Software Maintenance Models

BLOCK III: SOFTWARE RELIABILITY AND SOFTWARE MANAGEMENT

Unit 1 : Software Reliability
Unit 2 : Software Quality Management
Unit 3 : Software Configuration Management

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ISBN:

May, 2022

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Published on behalf of Institute of Distance and Open Learning, Gauhati University by the Director, and printed at Gauhati University Press, Guwahati-781014.

M.Sc.-IT-19-II-2046

GAUHATI UNIVERSITY
Institute of Distance and Open Learning

SECOND SEMESTER

(under CBCS)

M.Sc.- IT

Paper: INF 2046
COMPUTER GRAPHICS AND MULTIMEDIA

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BLOCK IV: MULTIMEDIA SYSTEMS AND COMPUTER ANIMATION

Unit 1 : Multimedia Systems
Unit 2 : Computer Animation
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May, 2022

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Published on behalf of Institute of Distance and Open Learning, Gauhati University by the Director, and printed at Gauhati University Press, Guwahati-781014.

M.Sc.-IT-19-II-2056

GAUHATI UNIVERSITY
Institute of Distance and Open Learning

SECOND SEMESTER

(under CBCS)

M.Sc.- IT

Paper: INF 2056

ADVANCED DATA STRUCTURE

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Unit 2 : Priority Queue ADT II
Unit 3 : Partition ADT
Unit 4 : B Tree and B+ Tree

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ISBN:

May, 2022

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Published on behalf of Institute of Distance and Open Learning, Gauhati University by the Director, and printed at Gauhati University Press, Guwahati-781014.