ख़्वाजा मुईनुद्दीन चिश्ती भाषा विश्वविद्यालय, लखनऊ, उत्तर प्रदेश (भारत)
Khwaja Moinuddin Chishti Language University, Lucknow, Uttar Pradesh (India)
U.P. State Government University
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BCA Semester IV
BCA 401: Database Management System

Credit: 04, IA Marks: 25, ESE Marks: 75
Lectures: 45 Hours, Tutorial: 15 Hours

OBJECTIVES OF THE COURSE:

1. To define the fundamental concepts of database management system.
2. To execute manually a given (simple) database design & transaction over it.
3. To implement (simple) algorithms and data structures as database transaction.
4. To introduce the concept of DBMS and provide a general introduction to relational model.
5. To understand & learn SQL.
6. To understand the concept of normalization.

UNIT- I   **Lectures: 11**

Introduction: An overview of database management system, Database System Vs File System, Database system concepts and architecture, data models schema and instances, data independence and data base language and interfaces, Data definitions language, DML, Overall Database Structure. Concepts of keys.

UNIT- II   **Lectures: 12**

Data Modelling using the Entity Relationship Model: ER model concepts, notation for ER diagram, mapping constraints, relationships of higher degree. Relational data Model and Language: Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra, Generalization, aggregation.

UNIT-III   **Lectures: 12**

Introduction to SQL: Characteristics of SQL, Advantages of SQL, SQL data types and literals, Types of SQL commands, SQL operators and their procedure, Tables, views and indexes, Queries and sub queries, Aggregate functions, Insert, update and delete operations, Joins, Unions, Intersection, Minus.

UNIT-IV   **Lectures: 10**

Data Base Design & Normalization: Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependencies, alternative approaches to database design. Transaction Processing Concepts: Transaction system, Database Concurrency, Database Recovery.
Distributed Database and Object Database Concepts: Scope, issues, applications and challenges of Distributed Database and Object Database

Course Outcome: After successful completion of this course students will be able to:

S. No.	Course Outcome	Bloom's Taxonomy
1	For a given query write relational algebra expressions for that query and optimize the developed expressions	K1, K2
2	For a given specification of the requirement design the databases using ER method and normalization	K2, K3
3	For a given specification create the SQL queries for Open source and Commercial DBMS -MYSQL	K2, K3, K4

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4	For a given evaluation of transaction-processing system, determine the transaction atomicity, consistency, isolation, and durability	K2, K3, K4

Suggested Readings:

1. Date C J, "An Introduction To Database System", Addision Wesley
2. Korth, Silbertz, Sudarshan, "Database Concepts", Tata Mcgraw-hill Education (India) Pvt. Ltd.
3. Elmasri, Navathe, "Fundamentals Of Database Systems", Pearson Education New Delhi India.
4. Bipin C. Desai, "An introduction to Database Systems", Galgotia Publication Pvt. Ltd. New Delhi.
5. Majumdar & Bhattacharya, "Database Management System", Tata Mcgraw-hill Education (India) Pvt. Ltd.

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BCA Semester IV
BCA 402 – Operating Systems

Credit: 06, IA Marks: 25, ESE Marks: 75
Lectures: 75 Hours, Tutorial: 15 Hours

OBJECTIVES OF THE COURSE:

1. To develop the understanding of the structure and functioning of Operating System.
2. To learn about Processes, Threads and Scheduling algorithms.
3. To understand the principles of concurrency and Deadlock.
4. To learn various memory management schemes.
5. To study I/O management and File systems.

UNIT-I **Lectures: 19**

Operating Systems Overview: Evolution of Operating System, Operating System structure, Types of Operating System: Batch Processing, Multiprogramming, Timesharing, Distributed System, Real Time System, Kernels, System calls.
Process Management: Process concepts, Process states, Process control blocks, Process Scheduling, Scheduling Criteria, Types of scheduling, CPU Scheduling Algorithms.

UNIT-II **Lectures: 19**

Concurrency Control: Principles of Concurrency, Inter-process Communication, Process Synchronization, Mutual Exclusion, Semaphores, Classical Problems of Synchronization: Readers-Writers, Producer Consumer, and Dining Philosopher problem.
Threads: Overview, Multithreading models, Threading issues
Deadlocks: Principles of Deadlock, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection.

UNIT-III **Lectures: 18**

Memory Management: Contiguous and Non-Contiguous memory allocation, Static and Dynamic Partitioning, Memory Allocation Strategies (First Fit, Best Fit, and Worst Fit), Fragmentation; Paging, Segmentations, Segmentation with Paging.
Virtual Memory: Concepts, management of virtual memory, Page Replacement Policies (FIFO, LRU, Optimal, Other Strategies), Thrashing.

UNIT-IV **Lectures: 19**

I/O Management: Disk Organization, Disk Parameters, Disk scheduling algorithms.
File Management: Concept of files, Files types and operations, File access and security, File storage Management, File Organization, Operating System security
Overview of Linux System: Design Principles, Kernel Modules, etc.

Course Outcome: After successful completion of this course students will be able to:

S. No.	Course Outcome	Bloom's Taxonomy
1	Understand the role of operating system, their types, System calls. Apply the process management policies and scheduling of processes by CPU.	K1, K2, K3
2	Understand the concept of process synchronization, concurrency, semaphores. Analyze a system model for deadlock and methods for handling deadlocks.	K1, K2, K3

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3	Understand the memory management, memory allocation, paging and segmentation and apply these concepts for mapping between primary memory and secondary memory.	K2, K3, K4
4	Understand the concept of Disk and various disk scheduling algorithms, File Management and basic concepts of Linux Operating System.	K2, K3, K4

Suggested Readings:

1. Silbersachatz and Galvin, "Operating System Concepts", Pearson.
2. Madnick E., Donovan J., "Operating Systems: Tata McGraw Hill.
3. H.M. Deitel, Operating Systems, Prentice-Hall.
4. Tannenbaum, "Operating Systems", PHI.
5. D.M. Dhamdhere, Operating Systems A Concept Based Approach, TMH.

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BCA Semester IV
BCA 403 – E-Commerce

Credit: 06, IA Marks: 25, ESE Marks: 75
Lectures: 75 Hours, Tutorial: 15 Hours

OBJECTIVES OF THE COURSE:

1. To introduce the concepts of E-Commerce infrastructure.
2. To understand security concerns in E-Commerce.
3. To gain technical understanding of Electronic Payment Systems.

UNIT-I **Lectures: 19**

Introduction to E-Commerce: Fundamental of e-commerce, Brief history of e-commerce, Impact of e-commerce, Benefits and limitations of e-commerce, Classification of ecommerce: Inter organizational e-commerce, Intra organizational e-commerce, Business to Business electronic commerce, Business to Customer electronic commerce and Collaborative commerce, Mobile Commerce etc., Applications of e-commerce technologies, E-Commerce Business models.

UNIT-II **Lectures: 19**

E-Commerce Infrastructure: Framework of e-commerce, I-Way Concept, EC Enablers, Review of the Internet structure, the TCP/IP Protocol Suite, The client/server model, Review of the architectural components of World-Wide Web, Proxy servers, Internet call centers, cookies, Agents in e-commerce and their role, Network infrastructure for ecommerce: Intranets and their applications, Extranets and their applications, Virtual Private Networks (VPNs), Internet-based VPNs, Firewalls, and their types.

UNIT-III **Lectures: 19**

Security in E-Commerce: Issues in Network and Transaction Security, Cryptography and Cryptanalysis, Symmetric and Public Key Cryptographic systems, Authentication protocols, Public Key Infrastructure (PKI), Integrity and Non-repudiation, Digital Certificates, Digital Signatures, Electronic mail security, Security protocols for web commerce: SSL, SET etc.

UNIT-IV **Lectures: 18**

Electronic Payments: Introduction to Money, The nature of money, Overview of electronic payment systems, Limitations of traditional payment instruments, Electronic payment requirements, Micro payments, Online payment systems, Card-based payment systems.

Course Outcome: Upon successful completion of this course students should acquire the following course outcomes.

COs	CO Statement	Bloom's Taxonomy
CO1	Illustrate the major categories and trends of ecommerce applications and Examine the essential processes of an e-commerce system.	**K1, K2**
CO2	To Understand E-Commerce Architecture.	**K2**
CO3	Analyze the basic concepts of cryptography and network security and classify attacks on a network. .	**K2, K3**
CO4	Define various electronic payment types and associated security	**K1, K2**

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	risks and the ways to protect against them.	

Suggested Readings:

1. David Whiteley, "E-Commerce", Tata McGraw Hill.
2. Ravi Kalakota, Electronic Commerce, Pearson.
3. Goel Ritendra, E-Commerce, New Age.
4. K. C. Laudon and C. G. Traver, "E-commerce: business, technology, society", Addison Wesley
5. Eframi Turban, Jae Lee, David King, K. Michale Chung, "Electronic Commerce", Pearson.

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BCA Semester IV (Minor Elective)
BCA 404 – Advanced Office Automation

Credit: 04, IA Marks: 25, ESE Marks: 75
Lectures: 45 Hours, Lab: 30 Hours

OBJECTIVES OF THE COURSE:
1. To explore various features of MS-Word and its applications.
2. To explore various features of MS-Excel and its applications.
3. To design the presentation using MS-Power Point.

UNIT-I   Lectures: 10

MS-Word: Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Using Tool bars, Ruler, using help. Setting Font styles, Font selection- style, size, colour, etc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Alignments, Indents, Line Space, Margins, Bullets & Numbering, Formatting Page, Page tab, Margins, Layout settings, Header & footer, Shortcut Keys; Page Numbering, Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Inserting Clip Arts, Pictures/Files etc.

UNIT-II   Lectures: 10

MS-Excel: Spread Sheet & its Applications, Opening Spreadsheet, **Menus**- main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. **Working with Spreadsheets**- opening, Saving files, setting Margins, Converting files to different formats, Rows, Columns & Cells, Referring Cells & Selecting Cells, Shortcut Keys.
Entering & Deleting Data: Entering data, Cut, Copy, Paste, Undo, Redo, highlighting values, Find, Search & replace, Inserting Clipart, Pictures, Files etc.

UNIT-III   Lectures: 13

MS-Excel: Setting Formula- finding total in a column or row, Mathematical operations (Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae.
Formatting Spreadsheets: Formatting- Cell, row, column & Sheet, Alignment, Font, Border & Shading, Hiding/ Locking Cells, Sheet Name, Row height & Column width, Security, Borders & Shading, Shortcut keys. Sorting, Filtering, Validation, Creating various Charts, Printing, Error checking, Spell Checks.

UNIT-IV   Lectures: 12

MS-Power Point: Introduction to Presentation, Opening New Presentation, Different Presentation Templates, Setting Backgrounds, Selecting Presentation Layouts. Creating a Presentation: Setting Presentation style, Adding text to the Presentation, Creating, Saving and Printing a presentation, Adding a slide to presentation, Slide-show, **Formatting a Presentation-** Adding style, Colour, Adding Header & Footer, Slide Background, Adding Graphics to the Presentation, Inserting pictures, tables etc into presentation, Adding Effects to the Presentation: Setting Animation.

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Course Outcome: Upon successful completion of this course students should acquire the following course outcomes.

S. No.	Course Outcome	Bloom's Taxonomy
1	CO1. Acquire knowledge about MS-Word, Starting MS-Word, Creating and Formatting a document, setting up a different formatting styles, creating tables and learning related operations.	K1, K2
2	CO2.To understand MS-Excel: spreadsheets and various operations on them, working on data in spreadsheets	K2, K3
3	CO3. To understand MS-Excel: setting formula, formatting spreadsheets, creating various charts.	K2, K3
4	CO4. Acquire knowledge about MS-Power Point, new presentation, adding slides, working with presentation templates, setting styles, slide-show functionalities, different formatting styles used, working with and animation.	K2, K3

Suggested Readings:

1. MS-Office 2000(For Windows) – By Steve Sagman.
2. Office 2007 – By Shelly, Cengage Publication.
3. MS-Office 2007 – Michael Price
4. Comdex windows 7 with Office 2010 – By Vikas Gupta, Dreamtech Press
5. MS-Office 2000 – No Experience Required, Courter G. and Marquis A., BPB Publications.
6. Working in Microsoft Office, Mansfield R., Tata McGraw Hill Edition.
7. Teach Yourself Microsoft Office 2000, Perry G., Techmedia

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BCA 405: Lab: DBMS

Credit: 02, IA Marks: 25, ESE Marks: 75
Lab: 60 Hours

OBJECTIVES OF THE COURSE:

1. To understand the fundamental concepts of database management system.
2. To understand the concept of entity-relationship.
3. To create and manage database/tables.
4. To create and query database tables for various cases.
5. To retrieve data from multiple tables.
6. To handle the aggregate functions.
7. To understand the concept of normalization and dependencies.
8. Creation and querying & managing database tables.
9. Writing SQL statements.
10. Restricting and sorting data.
11. Displaying data from multiple tables.
12. Aggregating data using group function.
13. Manipulating data.
14. Design of tables by normalization and dependency analysis.

Note: The Instructor may add/delete/modify experiments, wherever he/she feels in a justified manner.

Course Outcome: Upon successful completion of this course students should acquire the following course outcomes.

S. No.	Course Outcome	Bloom's Taxonomy
1	To understand the creation and managing database/tables.	K1, K2
2	Querying of database tables for various cases. To retrieve data from multiple tables.	K2, K3
3	To handle the aggregate functions.	K2, K3
4	To understand the concept of normalization and dependencies.	K1, K2, K3, K4

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BCA Semester IV
BCA 406-Introduction to Database and MySQL

Credit: 03, IA Marks: 25, ESE Marks: 75
Lectures: 30 Hours, Lab: 30 Hours

OBJECTIVES OF THE COURSE:

1. To understand basic concepts of Database System
2. To understand Relational Data Model & design the databases using ER method and normalization.
3. To acquire knowledge of Database Languages.
4. To learn various SQL queries and implement the SQL queries using Open source DBMS - MYSQL.

Unit-I   **Lectures: 07**

Introduction to Database: Fundamentals of Database, Data, Information, Knowledge, Database System Vs File System, Database system concepts and architecture, Data Independence, Database Users, Application of Database, Concepts of keys.

Unit-II   **Lectures: 07**

Relational data model concepts, Relation, Tuples, Attributes, Entity & Entity Set, ER model concepts, notation for ER diagram, integrity constraints: entity integrity, referential integrity, Normalization.

Unit-III   **Lectures: 08**

Introduction to MySql, Introduction to SQL: Database Languages- DDL, DML, DCL, SQL data types, Types of SQL, Tables, views and indexes, Integrity Constraints.

Unit-IV   **Lectures: 08**

Queries and sub queries, Aggregate functions, JOINs, clauses: group by, having, order by, Set Operations: Unions, Intersection, Difference, Cartesian Product.

Course Outcome: After successful completion of this course the student will be able to:

S. No.	Course Outcome	Bloom's Taxonomy
1	To understand Database system concepts and architecture Concepts of keys.	K2
2	To acquire knowledge of Database Languages &For a given specification of the requirement design the databases using ER method and normalization.	K2, K3
3	For a given specification create the SQL queries for Open-source DBMS -MYSQL.	K6
4	For a given specification create the advance SQL queries for Open-source DBMS -MYSQL.	K6

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Suggested Readings:

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2. Korth, Silbertz, Sudarshan, "Database Concepts", Tata Mcgraw-hill Education (India) Pvt. Ltd.
3. Elmasri, Navathe, "Fundamentals Of Database Systems", Pearson Education New Delhi India.
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5. Majumdar & Bhattacharya, "Database Management System", Tata Mcgraw-hill Education (India) Pvt. Ltd.