

### Semester-III

Course Code: BCAC07T	<b>Course Title:</b> Database Management Systems (DBMS)
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 02 Hours

#### **Course Outcomes (COs):**

- Explain the various database concepts and the need for database systems.
- Identify and define database objects, enforce integrity constraints on a database using DBMS.
- Demonstrate a Data model and Schemas in RDBMS.
- Identify entities and relationships and draw ER diagram for a given real-world problem.
- Convert an ER diagram to a database schema and deduce it to the desired normal form.
- Formulate queries in Relational Algebra, Structured Query Language (SQL) for database manipulation.
- Explain the transaction processing and concurrency control techniques.

Content	Hours
<b>Unit-1</b>	
<b>Database Architecture:</b> Introduction to Database system applications. Characteristics and Purpose of database approach. People associated with Database system. Data models. Database schema. Database architecture. Data independence. Database languages, interfaces, and classification of DBMS.	10
<b>Unit2</b>	
<b>E-R Model:</b> Entity-Relationship modeling: E – R Model Concepts: Entity, Entity types, Entity sets, Attributes, Types of attributes, key attribute, and domain of an attribute. Relationships between the entities. Relationship types, roles and structural constraints, degree and cardinality ratio of a relationship. Weak entity types, E -R diagram.	08



### Unit-3

<b>Relational Data Model:</b> Relational model concepts. Characteristics of relations. Relational model constraints: Domain constraints, key constraints, primary & foreign key constraints, integrity constraints and null values. Relational Algebra: Basic Relational Algebra operations. Set theoretical operations on relations. JOIN operations Aggregate Functions and Grouping. Nested Sub Queries-Views. Introduction to PL/SQL & programming of above operations in PL/SQL.	08
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### Unit-4

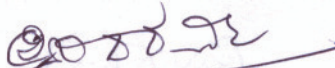
<b>Data Normalization:</b> Anomalies in relational database design. Decomposition. Functional dependencies. Normalization. First normal form, Second normal form, Third normal form. Boyce-Codd normal form.	08
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### Unit-5

<b>Query Processing Transaction Management:</b> Introduction Transaction Processing. Single user & multiuser systems. Transactions: read & write operations. Need of concurrency control: The lost update problem, Dirty read problem. Types of failures. Transaction states. Desirable properties (ACID properties) of Transactions. Concurrency Control Techniques: Locks and Time stamp Ordering. Deadlock & Starvation.	08
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### References:

1. Fundamentals of Database Systems, Ramez Elamassri, Shankant B. Navathe, 7th Edition, Pearson, 2015
2. An Introduction to Database Systems, Bipin Desai, Galgotia Publications, 2010.
3. Introduction to Database System, C J Date, Pearson, 1999.
4. Database Systems Concepts, Abraham Silberschatz, Henry Korth, S.Sudarshan, 6<sup>th</sup> Edition, McGraw Hill, 2010.
5. Database Management Systems, Raghu Rama Krishnan and Johannes Gehrke, 3<sup>rd</sup> Edition, McGraw Hill, 2002

  
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Course Code: BCAC07P	Course Title: DBMS Lab
Course Credits: 02	Hours/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 02 Hours

### Programming Lab

**Course Outcomes (COs):** Student would be able to create tables, execute queries and PL/SQL programs.

#### PART-A

1. Execute a single line query
2. Execute group functions.
3. Execute DDL Commands.
4. Execute DML Commands
5. Execute DCL Commands
6. Execute TCL Commands.
7. Implement the Nested Queries.
8. Implement Join operations in SQL
9. Create views for a particular table
10. Implement Locks for a particular table

  
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### **PART-B**

- 1) Write PL/SQL program to display square and cube of a given number.
- 2) Write PL/SQL program to find area of rectangle.
- 3) Write PL/SQL program to find simple interest.
- 4) Write PL/SQL program to check whether a number is even or odd.
- 5) Write PL/SQL program to do reverse of given number.
- 6) Write PL/SQL program to find factorial of a given number.
- 7) Write PL/SQL procedure to accept EMPNO as input and display EMPLOYEE NAME. Raise an EXCEPTION if EMPNO is not in the EMPLOYEE Table.
- 8) Write PL/SQL procedure to display the contents of EMPLOYEE table using CURSORS
- 9) Write PL/SQL procedure to create a FUNCTION to count the number of employees in the EMPLOYEE table
- 10) Write PL/SQL procedure to demonstrate PACKAGES.

### **Evaluation Scheme for Lab Examination**

Assessment Criteria		Marks
Program - 1 from Part A	Flowchart / Algorithm	03
	Writing the Program	05
Program -2 from Part B	Flowchart/Algorithm	03
	Writing the Program	05
Execute any one program of Examiner choice		06
Viva Voce		03
Total		<b>25</b>

  
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Course Code: BCAC08T	<b>Course Title:</b> C# and Dot Net Framework
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 02 Hours

### Course Outcomes (COs):

- Describe Object Oriented Programming concepts like Inheritance and Polymorphism in C# programming language.
- Interpret and Develop Interfaces for real-time applications.
- Build custom collections and generics in C#.

Content		Hours
<b>Unit-1</b>		
	<b>Introduction to .Net Technologies:</b> Introduction to Web Technologies. HTML Basics, Scripts. Sample Programs. Advantages and Disadvantages of Client-side and Server-side Scripts. Overview of Client-side Technologies and Server-side Technologies.	10
<b>Unit-2</b>		
	<b>Introduction to C#:</b> Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Control Structures-Methods, Arrays, Strings, Structures, Enumerations. <b>OOPS with C#:</b> Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading Delegates, Events, Errors and Exceptions.	08
<b>Unit-3</b>		
	<b>Introduction to VB.NET:</b> Introduction VB.NET -IDE – Creating a shortcut to start VB.NET. Maneuverings the Toolbar Auto-hide, Docking and Undocking, Placing and Resizing the Windows, Forms, Properties Window and Solution Explorer. Writing and Event Procedure. Execution Basic Keywords. Data Types. VB.NET statements. Conditional statements: If Else, Select Case, Switch and Choose Loops: Do, For Next, For Each Next, While loop. Arrays.	08
<b>Unit-4</b>		
	<b>Application Development on .NET:</b> C#.NET: Building Windows Applications, VB.NET: Windows Forms. Working with Controls, Timer, Picture-box, Group-box, Combo-box, Horizontal and Vertical Scrollbar, Numeric-up-down, Track-bar, and Progress-bar. Subroutines and Functions in VB.NET. Database applications.	08

  
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Unit-5	
<b>ADO .NET Connectivity:</b> Introduction to ADO.NET, ADO vs ADO.NET. Architecture: Data reader, Data adapter, Accessing Data with ADO.NET. Programming Web Applications with Web Forms. ASP .NET applications with ADO.NET.	08

#### References:

1. "Programming in C#", E. Balagurusamy, 4<sup>th</sup> Edition, Tata McGraw-Hill, 2017.
2. "Visual Basic.NET", Shirish Chavan, 3<sup>rd</sup> Edition, Pearson Education, 2009.
3. "ASP.NET and VB.NET Web Programming", Matt J. Crouch, Edition 2012.
4. "Computing with C# and the .NET Framework", Arthur Gittleman, 2<sup>nd</sup> Edition, Jones & Bartlett Publishers, 2011.



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Course Code: BCAC08P	<b>Course Title:</b> C# and Dot Net Framework Lab
Course Credits: 02	Hours/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks: 25	Exam Duration: 02 Hours

## Programming Lab

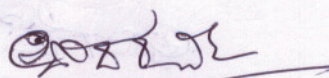
### Part-A

1. Develop a C# .NET console application to demonstrate the conditional statements.
2. Develop a C# .NET console application to demonstrate the control statements.
3. Develop an application in C#.NET that demonstrates the windows controls
4. Demonstrate Multithreaded Programming in C#.NET
5. Demonstrate subroutines and functions in C#.NET

### Part-B

1. Develop an application for deploying various built-in functions in VB.NET
2. Develop an MDI application for Employee Pay-roll transactions in VB.NET
3. Construct a console application to demonstrate the OOP Concepts
4. Develop a web application in VB.NET for dynamic Login Processing
5. Develop a Windows application with database connectivity for core-banking transactions

Assessment Criteria		Marks
Program - 1 from Part A	Flowchart / Algorithm	03
	Writing the Program	05
Program -2 from Part B	Flowchart/Algorithm	03
	Writing the Program	05
Execute any one program of Examiner choice		06
Viva Voce		03
Total		<b>25</b>



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Course Code: BCAC09T	<b>Course Title:</b> Data Communication and Networks
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 02 Hours

### Course Outcomes (COs):

- Explain the transmission technique of digital data between two or more computers and a computer network that allows computers to exchange data.
- Apply the basics of data communication and various types of computer networks in real world applications.
- Compare the different layers of protocols.
- Compare the key networking protocols and their hierarchical relationship in the conceptual model like TCP/IP and OSI.

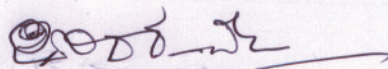
Content	Hours
<b>Unit-1</b>	
<b>Introduction:</b> Computer Networks and its applications, Network structure, network architecture, Topologies, LAN, WAN, MAN, The OSI reference model, The TCP/IP reference model.	10
<b>Unit-2</b>	
<b>The Physical Layer:</b> Transmission Media - Twisted pair, coaxial cable, optical fiber, radio transmission, microwaves and infrared transmission, Switching - message switching, Multiplexing.	08
<b>Unit-3</b>	
<b>The Data Link Layer:</b> Data Link Layer design issues, Error detection - Single parity checking, Checksum, polynomial codes - CRC, Error correction- Hamming code, Elementary data link protocols, sliding window protocols.	08
<b>Unit-4</b>	
<b>The Network Layer:</b> Network layer design issues, Routing algorithms - Flooding, Distance vector routing, Hierarchical routing, Link state routing, Congestion, control algorithms - Leaky bucket, token bucket algorithm, admission control, Hop by Hop choke packets.	08
<b>Unit-5</b>	
<b>The Transport Layer and Application Layer:</b> Elements of Transport service, Elements of Transport, protocols, Internet transport protocols (TCP & UDP), DNS, Electronic Mailing, and World Wide Web.	08



## References:

1. Computer Networks, Andrew S. Tanenbaum, 5<sup>th</sup> Edition, Pearson Education, 2010.
2. Data Communication & Networking, Behrouza A Forouzan, 3<sup>rd</sup> Edition, Tata McGraw Hill, 2001.
3. Data and Computer Communications, William Stallings, 10<sup>th</sup> Edition, Pearson Education, 2017.
4. Data Communication and Computer Networks, Brijendra Singh, 3<sup>rd</sup> Edition, PHI, 2012.
5. Data Communication & Network, Dr. Prasad, Wiley Dreamtech.

<http://highereducation.com/sites/0072967757/index.htmls>



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### Open Elective-3

Course Code: CSOET3	Course Title: C Programming Concepts
Course Credits: 03	Hours/Week: 03
Total Contact Hours: 42	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 02 Hours

Course Outcomes (COs):

After completing this course satisfactorily, a student will be able to:

- Confidently operate Desktop Computers to carry out computational tasks
- Understand working of Hardware and Software and the importance of operating systems
- Understand programming languages, number systems, peripheral devices, networking, multimedia and internet concepts
- Read, understand and trace the execution of programs written in C language
- Write the C code for a given problem
- Perform input and output operations using programs in C
- Write programs that perform operations on arrays

Content	Hours
<b>Unit - 1</b>	
<b>Fundamentals of Computers:</b> Introduction to Computers - Computer Definition, Characteristics of Computers, Types of Computers, Basic Organization of a Digital Computer; Number Systems – different types; Computer Codes – BCD, Gray Code, ASCII and Unicode; Boolean Algebra – Boolean Operators with Truth Tables; Types of Software – System Software and Utility Software; Computer Languages - Machine Level, Assembly Level & High Level Languages, Translator Programs – Assembler, Interpreter and Compiler; Planning a Computer Program - Algorithm, Flowchart and Pseudo code with Examples.	10
<b>Unit - 2</b>	
<b>Introduction to C Programming:</b> Over View of C; History and Features of C; Structure of a C Program with Examples; Creating and Executing a C Program; Compilation process in C.  <b>C Programming Basic Concepts:</b> C Character Set; C tokens - keywords, identifiers, constants, and variables; Data types; Declaration & initialization of variables; Symbolic constants.  <b>Input and output with C:</b> Formatted I/O functions - <i>printf</i> and <i>scanf</i> , control strings and escape sequences, output specifications with <i>printf</i> functions;	8



Unformatted I/O functions to read and display single character and a string - <i>getchar, putchar, gets</i> and <i>puts</i> functions.	
<b>Unit - 3</b>	
<b>C Operators &amp; Expressions:</b> Arithmetic operators; Relational operators; Logical operators; Assignment operators; Increment & Decrement operators; Bitwise operators; Conditional operator; Special operators; Operator Precedence and Associativity; Evaluation of arithmetic expressions; Type conversion. <b>Control Structures:</b> Decision making Statements - <i>Simple if, if_else, nested if_else, else_if ladder, Switch-case, goto, break &amp; continue</i> statements; Looping Statements - Entry controlled and Exit controlled statements, <i>while, do-while, for</i> loops, Nested loops.	8
<b>Unit - 4</b>	
<b>Arrays:</b> One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays - Declaration, Initialization and Memory representation. <b>Strings:</b> Declaring & Initializing string variables; String handling functions - <i>strlen, strcmp, strcpy and strcat</i> ; Character handling functions - <i>toascii, toupper, tolower, isalpha, isnumeric</i> etc.	8
<b>Unit 5</b>	
<b>User Defined Functions:</b> Need for user defined functions; Format of C user defined functions; Components of user defined functions - return type, name, parameter list, function body, return statement and function call; Categories of user defined functions - With and without parameters and return type.	8

#### Text Books:

1. Pradeep K. Sinha and Priti Sinha: Computer Fundamentals(Sixth Edition), BPB Publication
2. E. Balgurusamy: Programming in ANSI C (TMH)

#### References:

1. Kamthane: Programming with ANSI and TURBO C (Pearson Education)
2. V. Rajaraman: Programming in C (PHI -EEE)
3. S. ByronGottfried: Programming with C (TMH)
4. Kernighan & Ritchie: The C Programming Language (PHI)
5. Yashwant Kanitkar: Let us C
6. P.B. Kottur: Programming in C (Sapna Book House)