

SEMESTER -III

Course Name: Introduction to Database Systems

Course Code: BCA017A

L (Hr.)	T (Hr.)	P (Hr.)	C
4	0	0	4

Objectives: Students would be able to:

1. Understand the role of database management system in an organization, basic database concepts, including the structure and operation of the relational data model.
2. Construct simple and moderately advanced database queries using, Structured Query Language (SQL).
3. Understand and successfully apply logical database design principles, including E-R diagrams and database normalization.

UNIT-I

Basic Concepts - Purpose of database systems-Components of DBMS – DBMS Architecture and Data Independence- Data modeling - Entity Relationship Model, Relational – Network-Hierarchical and object oriented models-Data Modeling using the Entity Relationship Model.

UNIT-II

Structure of relational databases – relational databases – relational algebra- tuple relational calculus. Data definition with SQL, insert, delete and update statements in SQL – views – data manipulation with SQL

UNIT-III

Introduction to Transaction Processing- Transaction and System Concepts- Desirable properties of Transactions- Schedules and Recoverability- Serializability of Schedules-Query processing and Optimization-Concurrency Control- -assertions – triggers. Oracle case study: The basic structure of the oracle system – database structure and its manipulation in oracle-storage organization in oracle - Programming in PL/SQL- Cursor in PL/SQL

UNIT-IV

Database Design– Design guidelines– Relational database design – Integrity Constraints – Domain Constraints- Referential integrity – Functional Dependency- Normalization using Functional Dependencies, Normal forms based on primary keys- general definitions of Second and Third Normal Forms. Boyce Codd Normal Form– Multivalued Dependencies and Forth Normal Form – Join Dependencies and Fifth Normal Form – Pitfalls in Relational Database Design.

UNIT-V

Distributed databases: Distributed Database Concepts- Data Fragmentation, Replication and Allocation Techniques- Different Types- Query Processing – semijoin - Concurrency Control and Recovery.

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Install, configure, and interact with a relational database management system.
2. Describe, define and apply the major components of the relational database model to database design.
3. Learn and apply the Structured Query Language (SQL) for database definition and manipulation; Utilize a database modeling technique for a single entity class, a one-to-one (1:1) relationship between entity classes, a one-to-many (1:M) relationship between entity classes, a many-to-many (M:M) relationship between entity classes, and recursive relationships.

Text Books

1. Fundamentals of Database System Elmasri and Navathe (4rd Edition), Pearson Education Asia (2008)
2. Database System Concepts - Henry F Korth, Abraham Silbershatz, McGraw Hill 2nd edition. (2005)
3. R. Elmasri, S.B. Navathe, Fundamentals of Database Systems, 6th edition, Pearson Education, 2010.

Reference Books

1. An Introduction to Database Systems - C.J.Date (7th Edition) Pearson Education Asia (2006)
2. A.Silberschatz, H. Korth and S. Sudarshan, *Database System Concepts*, 5th Edition, McGraw Hill, 2010.
3. R. Ramakrishnan, J. Gehrke, *Database Management Systems*, 3rd edition, McGraw Hill International Edition, 2007.

BCA Syllabus at JECRC University

Course Name: Data Communications and Computer Networks

Course Code: BCA018A

L (Hr.)	T (Hr.)	P (Hr.)	C
4	0	0	4

Objectives: Students would be able to:

1. Explain the importance of data communications and the Internet in supporting business communications and daily activities; explain how communication works in data networks and the Internet.
2. Recognize the different internetworking devices and their functions.
3. Explain the role of protocols in networking and analyze the services and features of the various layers of data networks.

UNIT-I

Introduction: Network definition, Network topologies, Network classifications, Layered network architecture, protocol and interface, Overview of ISO-OSI reference model, Overview of TCP/IP protocol suite. Data Communication Fundamentals and Techniques: Analog and digital signal, Data-rate limits, Digital to digital line encoding schemes, Pulse code modulation, Digital to analog modulation- ASK, FSK, PSK, QAM, multiplexing techniques- FDM, TDM, WDM, transmission media.

UNIT-II

Networks Switching Techniques and Access mechanisms: Circuit switching; Packet switching- Connectionless datagram switching, Connection-oriented virtual circuit switching. Data Link Layer Functions and Protocol: Error detection and error correction techniques, Data-link control- framing and flow control, Error recovery protocols- Stop and wait ARQ, Go-back-n ARQ, Selective repeat ARQ, Point to Point Protocol on Internet.

UNIT-III

Multiple Access Protocol and Networks: ALOHA, CSMA/CD protocols, Ethernet LANs, connecting LAN and back-bone networks- Repeaters, Hubs, Switches, Bridges, Router and Gateways.

UNIT-IV

Networks Layer Functions and Protocols: Routing, Routing algorithms, Network layer protocol of Internet- IP protocol, Internet control protocols.

UNIT-V

Transport Layer Functions and Protocols:

Transport services, Berkeley socket interface overview, Transport layer protocol of Internet- UDP and TCP. Overview of Application layer protocol: Overview of DNS protocol, Overview of WWW & HTTP protocol.

Learning Outcomes

Upon successful completion of this subject students should be able to:

1. Independently understand basic computer network technology.
2. Understand and explain Data Communications System and its components.
3. Identify the different types of network topologies and protocols.

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4. Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
5. Identify the different types of network devices and their functions within a network
6. Understand and building the skills of sub netting and routing mechanisms.

Text Books

1. B. A. Forouzan: Data Communications and Networking, 4th edition, Tata McGraw Hill Education Private Ltd., 2007.
2. A. S. Tanenbaum: Computer Networks, 4th edition, PEARSON, 2003.

Reference Books

3. D. E. Comer, M.S.Narayanan, Computer Networks and Internets with applications, Fourth Edition, PEARSON ,2008.

BCA Syllabus at JECRC University

Course Name: Operating Systems

Course Code: BCA019A

L (Hr.)	T (Hr.)	P (Hr.)	C
3	1	0	4

Objectives: Students would be able to:

1. Understand the services provided by and the design of an operating system.
2. Understand the structure and organization of the file system, understand what a process is and how processes are synchronized and scheduled.
3. Understand different approaches to memory management. Students should be able to use system calls for managing processes, memory and the file system. Students should understand the data structures and algorithms used to implement an OS.

UNIT-I

Introduction: Operating Systems functions, Types of operating systems, Multiprogramming systems, Batch systems, Time-sharing systems, Operating system operations, Special purpose operating systems, Distributed systems, Different computing environments.

Operating System Organization: Processor and user modes, user operating system interface, Kernels, System calls and its types, System programs, Operating system structures, Virtual machines.

UNIT-II

Process Management: Process states, Process Scheduling, Process hierarchy, Threads, Threading issues, Multithreading models, Non-pre-emptive and pre-emptive scheduling algorithms, Concurrent processes, Critical section, Semaphores, methods for inter-process communication, Deadlocks.

UNIT-III

Memory Management: Physical and virtual address space, Memory allocation strategies, Paging, Segmentation, Virtual memory and Demand paging, Page replacement algorithms.

UNIT-IV

File and I/O Management: Directory structure, File operations, Files system mounting, File allocation methods, Device management, Disk scheduling algorithms.

UNIT-V

Protection and Security: Policy mechanism, Program, Security problem, user authentication, program and system threats, Cryptography. Case study of UNIX operating system

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Understand what is an operating system and the role it plays.
2. Understand the structure of operating systems, applications, and the relationship between them.
3. Have some knowledge of the services provided by operating systems. Also have some exposure to some details of major OS concepts.

Text Books

1. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th edition, John Wiley Publications, 2008.

Reference Books

1. G. Nutt, Operating Systems: A Modern Perspective, 2nd edition Pearson Education, 1997.
2. A.S. Tanenbaum, Modern Operating Systems, 3rd edition, Pearson Education, 2007.
3. W. Stallings, Operating Systems, Internals & Design Principles, 5th edition, Prentice Hall of India, 2008.

BCA Syllabus at JECRC University

Course Name: Data Structures Using C

Course Code: BCA020A

L (Hr.)	T (Hr.)	P (Hr.)	C
3	1	0	4

Objectives: Students would be able to:

1. Learn efficient storage mechanisms of data for an easy access, design and implementation of various basic and advanced data structures, introduce various techniques for representation of the data in the real world.
2. Develop application using data structures, learn the concept of protection and management of data and improve the logical ability.
3. Choose appropriate data structure as applied to specified problem definition, handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.

UNIT-I

Single and Multidimensional arrays, Sequential Allocation, Address Calculations, Sparse Matrices and their efficient representation. Recursion, application of stacks to recursion problems.

UNIT-II

Singly and Double Linked Lists Operations on all these structures and applications of these structures. Circular Linked Lists, Self Organizing Lists , Stacks, Applications of stacks eg.: Infix to Postfix

UNIT-III

Queues, Overview of priority queue, Trees, Binary Trees, Complete Binary trees and almost complete Binary trees, BST, Tree traversal algorithms, Searching in Binary Search Tree

UNIT –IV

Introduction to Threaded Trees. BST Insertion & Deletion, Sorting Techniques (without efficiency): Bubble Sort, Selection Sort, Insertion Sort

UNIT-V

Searching Techniques (without efficiency): Linear search, Binary search, Hashing with Collision handling methods. Multiway trees – B-Tree, B+ Tree.

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Learn good principles of algorithm design.
2. Learn how to analyze algorithms and estimate their worst-case and average-case behavior (in easy cases).
3. Become familiar with fundamental data structures and with the manner in which these data structures can best be implemented; become accustomed to the description of algorithms in both functional and procedural styles.
4. Learn how to apply their theoretical knowledge in practice (via the practical component of the course).

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Text Books

1. Adam Drozdek, *Data Structures and algorithm in C++*, Third Edition, Cengage Learning, 2012.
2. SartajSahni, *Data Structures, Algorithms and applications in C++*, Second Edition, Universities Press, 2011.
3. Aaron M. Tenenbaum, Moshe J. Augenstein, YedidyahLangsam, *Data Structures Using C and C++*, Second edition, PHI, 2009.

Reference Books

4. D.S Malik, *Data Structure using C++*, Second edition, Cengage Learning, 2010.

BCA Syllabus at JECRC University

Course Name: Programming in C++ - I

Course Code: BCA021A

L (Hr.)	T (Hr.)	P (Hr.)	C
4	0	0	4

Objectives: Students would be able to:

1. Learn to design software using abstract data and control structures.
2. Learn structures including lists, stacks, queues, trees, and graphs.
3. Choose appropriate data structures and algorithms for problem solving.

Unit -I

Introduction and Features : Fundamentals of object oriented programming – procedure oriented programming, object oriented programming (OOP) Object oriented programming concepts – Classes, reusability, encapsulation, inheritance, polymorphism, dynamic binding, message passing.

Unit-II

Language Constructs Review of constructs of C used in C++ : variables, types and type declarations, userdefined data types; increment and decrement operators, relational and logical operators; ifthen else clause; conditional expressions, input and output statement, loops, switch case, arrays, functions, ; preprocessor directives

Unit-III

Classes and Objects Creation, accessing class members Private Vs Public Constructor and Destructor Objects. Member Functions Method definition Inline Implementation Constant member functions

Unit-IV

Overloading Member Functions Need of operator overloading, prefix and postfix, overloading binary operators, operator overloading, instream/outstream operator overloading.

Unit-V

Inheritance Definition of inheritance, protected data, private data, public data, inheriting constructors and destructors, constructor for virtual base classes, constructors and destructors of derived classes, and virtual functions, size of a derived class, order of invocation, types of inheritance, single inheritance, hierarchical inheritance, multiple inheritance, hybrid inheritance Polymorphism and Virtual Functions Importance of virtual function, function call binding, virtual functions, implementing late binding, need for virtual functions, abstract base classes and pure virtual functions, virtual destructors.

Learning Outcome

Upon successful completion of this subject students should be able to:

1. Understand object-oriented programming features in C++.
2. Apply these features to program design and implementation.
3. Understand object-oriented concepts and how they are supported by C++.
4. Gain some practical experience of C++.

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Text Books

1. C++: An introduction to programming by Jense Liberty Tim Keogh: BPB Publications, NewDelhi
2. OO Programming in C++ by Robert Lafore: ,Galgotia Publications Pvt. Ltd., Daryaganj, New Delhi

Reference Books

1. Object Oriented Programming Using C++, SanjeevSofat, Cyber Tech. Publication, NewDelhi
2. Object Oriented Programming in C++ by E. Balaguruswamy, TMH Publishing Co. Ltd.,

BCA Syllabus at JECRC University

Course Name: Database Systems Lab

Course Code: BCA022A

L (Hr.)	T (Hr.)	P (Hr.)	C
0	0	2	2

Objective: Students would be able to:

1. Be able to design, and implement Database management system with the help of an organization example.
2. Run different queries on the created database and show how they are working and get the required results.
3. Learn the different constructs of SQL, PL/SQL and implement them.

1. Create and use the following database scheme to answer the given queries.

EMPLOYEE Scheme

Field	Type	NULL	KEY	DEFAULT
Eno	Char(3)	NO	PRI	NIL
Ename	Varchar(50)	NO		NIL
Job_type	Varchar(50)	NO		NIL
Manager	Char(3)	Yes	FK	NIL
Hire_date	Date	NO		NIL
Dno	Integer	YES	FK	NIL
Commission	Decimal(10,2)	YES		NIL
Salary	Decimal(7,2)	NO		NIL

EMPLOYEE State

Eno	Ename	Job_type	Manager	Hire_date	Dno	Commission	Salary
765	Martin	Sales_man	198	1981-04-22	30	1400.00	1250.00
756	Jones	Manager	783	1981-04-02	20	0.00	2300.00
752	Ward	Sales_man	769	1981-02-22	30	500.00	1300.00
749	Allan	Sales_man	769	1981-02-20	30	300.00	2000.00
736	Smith	Clerk	790	1980-12-17	20	0.00	1000.00
793	Miller	Clerk	788	1982-01-23	4	0.00	1300.00
792	Ford	Analyst	756	1981-12-03	20	0.00	2600.00
790	James	Clerk	769	1981-12-03	30	0.00	950.00
787	Adams	Clerk	778	1983-01-12	20	0.00	1150.00
784	Turner	Sales_man	769	1981-09-08	30	0.00	1450.00
783	King	President	NULL	1981-11-17	10	0.00	2950.00
788	Scott	Analyst	756	1982-12-09	20	0.00	2850.00
778	Clark	Manager	783	1981-06-09	10	0.00	2900.00
769	Blake	Manager	783	1981-05-01	30	0.00	2870.00

DEPARTMENT Scheme

Field	Type	NULL	KEY	DEFAULT
Dno	Integer	No	PR	NULL
Dname	Varchar(50)	Yes		NULL
Location	Varchar(50)	Yes		New Delhi

DEPARTMENT State

Dno	Dname	Location
10	Accounting	New York
20	Research	Dallas
30	Sales	Chicago
40	Operation	Boston
50	Marketing	New Delhi

Query List

1. Query to display Employee Name, Job, Hire Date, Employee Number; for each employee with the Employee Number appearing first.
2. Query to display unique Jobs from the Employee Table.
3. Query to display the Employee Name concatenated by a Job separated by a comma.
4. Query to display all the data from the Employee Table. Separate each Column by a comma and name the said column as THE_OUTPUT.
5. Query to display the Employee Name and Salary of all the employees earning more than \$2850.
6. Query to display Employee Name and Department Number for the Employee No= 7900.
7. Query to display Employee Name and Salary for all employees whose salary is not in the range of \$1500 and \$2850.
8. Query to display Employee Name and Department No. Of all the employees in Dept 10 and Dept 30 in the alphabetical order by name.
9. Query to display Name and Hire Date of every Employee who was hired in 1981.
10. Query to display Name and Job of all employees who don't have a current Manager.
11. Query to display the Name, Salary and Commission for all the employees who earn commission. Sort the data in descending order of Salary and Commission.
12. Query to display Name of all the employees where the third letter of their name is A.
13. Query to display Name of all employees either have two R's or have two A's in their name and are either in Dept No = 30 or their Manger's Employee No = 7788.
14. Query to display Name, Salary and Commission for all employees whose Commission Amount is greater than their Salary increased by 5%.
15. Query to display the Current Date.
16. Query to display Name, Hire Date and Salary Review Date which is the 1st Monday after six months of employment.
17. Query to display Name and calculate the number of months between today and the date each employee was hired.
18. Query to display the following for each employee:-
<E-Name> earns < Salary> monthly but wants < 3 * Current Salary >. Label the Column as Dream Salary.

19. Query to display Name with the 1st letter capitalized and all other letter lower case and length of their name of all the employees whose name starts with `_J`, `'A'` and `_M`.
20. Query to display Name, Hire Date and Day of the week on which the employee started.
21. Query to display Name, Department Name and Department No for all the employees.
22. Query to display Unique Listing of all Jobs that are in Department # 30.
23. Query to display Name, Dept Name of all employees who have an `_A` in their name.
24. Query to display Name, Job, Department No. And Department Name for all the employees working at the Dallas location.
25. Query to display Name and Employee no. Along with their Manger's Name and the Manager's employee no; along with the Employees' Name who do not have a Manager.
26. Query to display Name, Dept No. And Salary of any employee whose department No. And salary matches both the department no. And the salary of any employee who earns a commission.
27. Query to display Name and Salaries represented by asterisks, where each asterisk (*) signifies \$100.
28. Query to display the Highest, Lowest, Sum and Average Salaries of all the employees
29. Query to display the number of employees performing the same Job type functions.
30. Query to display the no. Of managers without listing their names.
31. Query to display the Department Name, Location Name, No. Of Employees and the average salary for all employees in that department.
32. Query to display Name and Hire Date for all employees in the same dept. As Blake.
33. Query to display the Employee No. And Name for all employees who earn more than the average salary.

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Have knowledge how database is created and are able to implement the different query structures.
2. Run different constructs of SQL queries, also they are able to execute variations of queries.
3. Understand how query are being processed and executed.

BCA Syllabus at JECRC University

Course Name: Data Structures Using C Lab

Course Code: BCA023A

L (Hr.)	T (Hr.)	P (Hr.)	C
0	0	2	2

Objectives: Students would be able to:

1. Implement storage mechanisms of various basic and advanced data structures.
 2. Introduce various techniques for representation of the data in the real world, and develop application using data structures.
 3. Choose appropriate data structure as applied to specified problem definition, handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
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1. Write a menu driven program to implement the following sparse matrices using one-dimensional array:
 - i) Diagonal Matrix
 - ii) Lower Triangular Matrix
 - iii) Upper Triangular Matrix
 - iv) Symmetric Matrix
 2. Write a program to compute b^r using recursion where b represent base and r represents power.
 3. Write a program to reverse a user entered string using recursion.
 4. Write a program to perform the following Queue operations using Circular Array implementation (Use Templates):
 - i) Enqueue
 - ii) Dequeue
 5. Write a program to add two large integers using stack.
 6. Write a program to evaluate postfix expression using stack.
 7. Write a program to implement Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list and concatenate two linked lists (include a function and also overload operator +).
 8. Write a program to perform the following Stack operations using linked list.
 - i) Push
 - ii) Pop
 - iii) Clear
 9. Write a program to create and perform the following operations on Queues using linked list:
 - i) Enqueue
 - ii) Dequeue
 10. Write a program to implement Doubly Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
 11. Write a program to implement Circular Linked List using templates. Include functions for insertion, deletion and search of a number, reverse the list.
 12. Write a program to add two polynomials using linked list representation.
 13. Write a menu driven program to implement the following operations in an ordered linked list:
 - i) Insertion
 - ii) Deletion

- iii) Merging
- 14. Write a Program to reverse elements of a Stack using an additional Stack.
- 15. Write a Program to reverse elements of a Stack using an additional Queue.
- 16. Write a Program to implement the following operations in a Binary Search Tree
 - i) Insertion.
 - ii) Deletion by copying or by merging.
 - iii) Search a number in BST.
 - iv) Display the contents in one of preorder, postorder and inorder traversals using recursion.
 - v) Display the contents by level-by-level traversal.
 - vi) Count the leaf and non-leaf nodes of the tree.
 - vii) Display the height of the tree.
 - viii) Create the mirror image of the tree.
- 17. Write a menu driven program to implement the following sorting and searching algorithms
 - i) Selection Sort,
 - ii) Insertion Sort
 - iii) Binary Search
 - iv) Bubble Sort

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Learn good principles of algorithm design.
2. Differentiate in use of various types of data structures like stack, queue, and linked list. With the implementation of these structures they can see practical approach.
3. Use various data structures effectively in application programs.

Course Name: Operating System Lab

Course Code: BCA024A

L (Hr.)	T (Hr.)	P (Hr.)	C
0	0	2	2

Objectives: Students would be able to:

1. Learn UNIX architecture.
2. Learn different commands to operate this system, file structure of UNIX.
3. Know the introduction to Shell Programming and control structure.

BASIC UNIX COMMANDS

1. File Manipulation functions
 - Create,
 - open,
 - read,
 - write,
 - close,
 - mv,
 - cp,
 - rm.
2. Directory Manipulation functions such as mkdir, rmdir, cd, pwd.
3. ls with options such as -l, -s, etc
4. wc
5. diff
6. cmp
7. chmod
8. who
9. who am i
10. passwd
11. du
12. date
13. cal
14. grep
15. cat
16. sort and tail

Learning Outcomes: Upon successful completion of this subject students should be able to:

1. Learn Basic UNIX Commands.
2. Work on UNIX architecture.
3. Operate it with the help of commands, have knowledge of file structure.

BCA Syllabus at JECRC University

Course Name: Programming in C++-Lab

Course Code: BCA025A

L (Hr.)	T (Hr.)	P (Hr.)	C
0	0	2	2

Objective: Students would be able to:

1. Understand the role of inheritance, polymorphism, dynamic binding and generic structures in building reusable code.
 2. Write small/medium scale C++ programs with simple graphical user interface.
 3. Do object modeling in C++.
-
1. Write a function using variables as arguments to swap the values of a pair of integers.
 2. An election is contested by five candidates. The candidates are numbered 1 to 5 & voting is done by marking the candidate number on the ballot paper. Write a program to read the ballot & count the votes cast for each candidate using an array, variable count. In case, a number read is outside the range 1 to 5, the ballot should be considered as a 'spoilt ballot' and the program should also count the number of spoilt ballot.
 3. Write a program to read a matrix of size m*n from the keyboard and display the same on the screen.
 4. Define a class to represent a bank account including the following members: - Data members
 - a. Name of the depositors
 - b. Account number
 - c. Type of account
 - d. Balance amount in the accountMember function
 - To assign initial values
 - To deposit an amount
 - To withdraw an amount after checking the balance
 - To display the name and balance.
 5. Modify the class and the program of practical 4 for handling 10 customers.
 6. Create 2 classes OM and DB which store the value of distance. DM store distances in meters and cm and DB in feet and inches. Write a program that can read values for the class objects and add 1 object OM with another object of DB. Use a friend function to carry out the addition operation the object that stores the results may be a DM object or a DB object, depending upon the units in which the results are required. The display should be in the format of feet and inches or meters and cms depending on the object on display.
 7. A book shop maintains the inventory of books that are being sold at the shop the list includes details such as author, title and publisher and stock position. Whenever a customer wants the book, the sales person inputs the title and author and the system searches the list and displays whether it is available or not. If it is not, an appropriate message is displayed, if it is, then the system displays the book details and requests for the number of copies required. If the requested are available, the total cost of the required copies is displayed: otherwise the message "Required copies not in stock" is displayed. Design a system using a class called books with suitable member functions and constructors. Use new operator in constructor to allocate memory space required.

8. Define a class string that could work as a user defined string type include constructors that will enable us to create an .un-initialized string. String s1; :/ string with length 0 And also to initialize an object with string constant at the time of creation like String s2("well done"); . Include a function that adds two strings to make a third string.
9. Create a class float that contains 2 float data member. Over load all the 4 arithmetic operators so that do operate on the objects of float.
10. Create a class MAT of size m*o. Define all possible matrix operation for MAT type objects.
11. Create a base class called shape use this class to store two double type values that could be used to compute the area of fig. Derive the specific class called TRIANGLE and RECTANGLE from the data shape. Add to base class, a member function get - data () to initialize base class data members and another member and another member function display – area() to compute and display the area of the fig. Make display – area () as a virtual function and redefine function in the derived classes to suit their requirements,Using these 3 classes design a program that will accept dimension of RECTANGLE orTRIANGLE interactivity and display the area.Remember the 2 values given as input will be treated as length of 2 sides in the case ofrectangle and as base and height in the case of triangles and used as follows:

Area of rectangle = x*y

Area of triangle = 1/2 *x*y

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Implement the concepts of C++ like inheritance, polymorphism, dynamic binding also they can use generic structures in building reusable code.
2. Write small/medium scale C++ programs with simple graphical user interface.
3. Do Data manipulation through file in C++

Course Name: Seminar-III
Course Code: BCA026A

L	T	P	C
(Hr.)	(Hr.)	(Hr.)	
4	0	0	4

BCA Syllabus at JECRC University

Course Name: Value Education

Course Code: BMC109A

L (Hr.)	T (Hr.)	P (Hr.)	C
3	0	0	3

UNIT-I

Values and Self Development-Social values and individual attitudes, Work ethics, Indian vision of humanism, Moral and non-moral valuation, Standards and principles, Value judgments. Importance of cultivation of values, Sense of duty, Devotion, Self-reliance, Confidence, Concentration, Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National unity, Patriotism, Love for nature, Discipline.

UNIT –II

Personality and Behavior Development- Soul and scientific attitude, God and scientific attitude, Positive thinking, Integrity and discipline, Punctuality, Love and kindness, Avoiding fault finding, Free from anger, Dignity of labor, Universal brotherhood and religious tolerance, True friendship, Happiness vs. suffering love for truth, Aware of self-destructive habits, Association and cooperation, Doing best, Saving nature.

UNIT-III

Character and Competence- Science vs. God, Holy books vs. blind faith, Self-management and good health, Science of reincarnation, Equality, Nonviolence, Humility, Role of women, All religions and same message, Mind your mind, Self-control, Honesty, Studying effectively.

UNIT IV

Human Rights- Jurisprudence of human rights nature and definition, Universal protection of human rights, Regional protection of human rights, National level protection of human rights, Human rights and vulnerable groups.

UNIT-V

Legislative Procedures- Indian constitution, Philosophy, fundamental rights and duties, Legislature, Executive and Judiciary, Constitution and function of parliament, Composition of council of states and house of people, Speaker, Passing of bills, Vigilance, Lokpal and functionaries.

Text Books

1. Chakraborty, S.K., Values and Ethics for Organizations Theory and Practice, Oxford University Press, New Delhi, 2001.
2. Kapoor, S.K., Human rights under International Law and Indian Law, Prentice Hall of India, New Delhi, 2002.
3. Basu, D.D., Indian Constitution, Oxford University Press, New Delhi, 2002.

Reference Books

1. Frankena, W.K., Ethics, Prentice Hall of India, New Delhi, 1990.
2. Meron Theodor, Human Rights and International Law Legal Policy Issues, Vol. 1 and 2, Oxford University Press, New Delhi, 2000.

Semester – IV

Course Name: Computer Graphics

Course Code: BCA027A

L (Hr.)	T (Hr.)	P (Hr.)	C
3	1	0	4

Objective: Students would be able to:

1. Understand contemporary graphics principles and graphics hardware.
2. Have a comprehensive introduction to computer graphics leading to the ability to understand contemporary terminology, progress, issues, and trends.
3. Have thorough introduction to computer graphics techniques, focusing on 3D modeling, image synthesis, and rendering.

UNIT-I

Introduction: Basic elements of Computer graphics, Applications of computer graphics. Graphics Hardware, Architecture of Raster and Random scan display devices, input/output devices.

UNIT-II

Drawing Primitives: Raster scan line, circle and ellipse drawing algorithms, Polygon filling, line clipping and polygon clipping algorithms

UNIT-III

Transformation and Viewing: 2D and 3D Geometric Transformations, 2D and 3D Viewing Transformations, Vanishing points.

UNIT-IV

Geometric Modeling: Representing curves (Hermite and Bezier). Visible Surface determination: (5 L) Z-buffer algorithm, List-priority algorithm and area subdivision algorithm.

UNIT-V

Surface Rendering: Color Models, Illumination and shading models, Computer Animation

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Understand graphics, how to capture basic primitives, transformation between them.
2. Understand and demonstrate computer graphics animation.
3. Understand and demonstrate geometrical transformations.

Text Books

1. Computer Graphics: Principles and Practice in C (2nd Edition) James D. Foley, Andries van Dam, Steven K. Feiner, John F. Hughes, Addison-Wesley Professional, 1995.
2. D. Hearn, Baker: Computer Graphics, (2nd Edition) Prentice Hall of India, 2008.

BCA Syllabus at JECRC University

Course Name: Multimedia Technology

Course Code: BCA028A

L (Hr.)	T (Hr.)	P (Hr.)	C
4		0	4

Objective: Students would be able to:

1. Present a step-by-step approach to multimedia systems design.
2. Introduce multimedia standards and compression and decompression technologies.
3. Provide a detailed analysis of the various storage technologies.

Unit I

Introduction to Multimedia: Hardware for Multimedia computer, Software for multimedia, ; Sound/Audio, Images and Graphics, Video and Animation.

Unit II

Data Compression, Optical Storage Media; Computer Technology, Multimedia Operating Systems

Unit III

Networking Systems, OSI network layer, TCP/IP protocol, Basics of Multiplexing, Local Area Network, Wide Area Networks, Multimedia Communication Systems; wireless networks, Database Systems;

Unit IV

Multimedia Architecture; Multimedia Documents, Hypertext and MHEG; Hypertext and Hypermedia, World Wide Web, Hypertext markup Language

Unit V

User Interfaces, Synchronization, Abstractions for Programming; Multimedia Application Development, Virtual Reality; Future Directions;

Learning Outcome:

Upon successful completion of this subject students should be able to:

1. Understand different realizations of multimedia tools and their usage.
2. Implement various multimedia standards and compression technologies.
3. Be capable of analyzing various storage technologies.

Text Books

1. —Multimedia Computing Communications & Applications || by Ralf Steinmetz, KlaraNahrstedt, Pearson Education (2004)
2. Principles of Multimedia by Parekh Ranjan, Tata McGraw-Hill(2007)

Reference Books

1. Multimedia Systems, By John E Koegal, Buford, IIBK. (1994)

BCA Syllabus at JECRC University

Course Name: Software Engineering

Course Code: BCA029A

L (Hr.)	T (Hr.)	P (Hr.)	C
4	0	0	4

Objective: Students would be able to:

1. Introduce software engineering and to explain its importance in building large programs.
2. Understand the process of developing new technology and the role of experimentation set out the answers to key questions about software engineering.
3. Introduce ethical and professional issues and to explain why they are of concern to software engineers

UNIT-I

Introduction: The Evolving Role of Software, Software Characteristics, Changing Nature of Software, Software Engineering as a Layered Technology, Software Process Framework, Framework and Umbrella Activities, Process Models, Capability Maturity Model Integration (CMMI)

UNIT-II

Requirement Analysis: Software Requirement Analysis, Initiating Requirement Engineering Process, Requirement Analysis and Modeling Techniques. Design Engineering: Design Concepts, Architectural Design Elements, Software Architecture, Data Design at the Architectural Level and Component Level, Mapping of Data Flow into Software Architecture.

UNIT-III

Quality Management: Quality Concepts, Software Quality Assurance, Software Reviews, Metrics for Process and Projects. Software Metrics: Product Metrics, Measures, Metrics and Indicators, Function Based Metrics, Process and Project ,Metrics, Software Measurements, and Metrics for software quality.

UNIT-IV

Estimations and Scheduling: Estimations for Software Projects, Empirical Estimation Models, Project Scheduling. Testing Strategies & Tactics: Software Testing Fundamentals, Strategic Approach to Software Testing, Test Strategies for Conventional Software, Black-Box Testing, White-Box Testing, Basis Path Testing.

UNIT-V

Risk Management: Software Risks, Risk Identification, Risk Projection and Risk Refinement, Risk Mitigation, Monitoring and Management.

Learning Outcome

Upon successful completion of this subject students should be able to:

1. Design and conduct experiments, as well as to analyze and interpret data.
2. Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
3. Identify, formulates, and solves engineering problems.

BCA Syllabus at JECRC University

4. Have an understanding of professional and ethical responsibility.
5. Understand the impact of engineering solutions in a global, economic, environmental, and societal context.

Text Books

1. R.S. Pressman, Software Engineering: A Practitioner's Approach, McGraw-Hill, Ed 7, 2010.
2. P. Jalote, An Integrated Approach to Software Engineering, Narosa Publishing House, Edition 3, 2011.

Reference Books

3. R. Mall, Fundamentals of Software Engineering, Prentice-Hall of India, 3rd Edition, 2009. 4.I. Sommerville, Software Engineering (9th edition), Addison Wesley, 2010

BCA Syllabus at JECRC University

Course Name: E-Commerce Banking and Security Transaction
Course Code: BCA030A

L (Hr.)	T (Hr.)	P (Hr.)	C
4	0	0	4

Objective: Students would be able to:

1. Define e-commerce and compare and contrast it from e-business.
2. Identify some business applications of e-commerce, identify, define and differentiate the various forms of e-commerce.
3. Recognize the business impact and potential of e-Commerce.

UNIT-I

Introduction: Definition of Electronic Commerce, The scope of Electronic Commerce, The value chain, Competitive advantage, Business strategy. Business to Business Electronic Commerce: Electronic markets, Electronic data interchange (EDI), EDI: the nuts and bolts, EDI and Business Inter-organizational E-Commerce.

UNIT-II

E-banking: Definition, Transaction websites components, E-banking Support Services, Wireless Banking. E-Banking Risk: Transaction/Operation Risk, Credit Risk. Risk Management of E-Banking Activities.

UNIT-III

Board Management Oversight, Managing outstanding relationship, Information Security Program, Administrative controls, Legal and compliance Issue.

UNIT-IV

Electronic Payment System, Need of E-Payment System, Online Payment Mechanism, Payment Gateway, Digital Currencies, Plastic Money: Debit Card, Credit Card, NEFT, RTGS

UNIT-V

E-Security: Security Issues in E-banking, Increasing concerns on security, Threats and Security Measures in E-banking, Secure Electronic Transitions, Role of RBI and Legal issues, Government Policies and Agenda.

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Have knowledge of e-commerce, its components, structure of e-banking, rules and regulations on e-commerce.
2. Discuss the trends in e-Commerce and the use of the Internet.
3. Explain the economic consequences of e-Commerce.

Text Books

1. Ravi Kalakota, Andrew Winston, —Frontiers of Electronic Commerce, Addison Wesley.
2. Bajaj and Nag, —E-Commerce the cutting edge of Business, TMH
3. P. Loshin, John Vacca, —Electronic commerce, Firewall Media, New Delhi

BCA Syllabus at JECRC University

Course Name: Computer Graphics Lab

Course Code: BCA031A

L (Hr.)	T (Hr.)	P (Hr.)	C
0	0	2	2

Objective: Students would be able to:

1. Implement different computer graphics algorithms, these algorithm make them learn about the creation of primitives of graphics, storage and generation.
2. Create interactive graphics applications in C++ using one or more graphics application programming interfaces.
3. Write programs that demonstrate geometrical transformations.

1. Write a program to implement Bresenham's line drawing algorithm,
2. Write a program to implement mid-point circle drawing algorithm
3. Write a program to clip a line using Cohen and Sutherland line clipping algorithm.
4. Write a program to clip a polygon using Sutherland Hodgeman algorithm.
5. Write a program to fill a polygon using Scan line fill algorithm.
6. Write a program to apply various 2D transformations on a 2D object (use homogenous coordinates).
7. Write a program to apply various 3D transformations on a 3D object and then apply parallel and perspective projection on it.
8. Write a program to draw Hermite/Bezier curve.

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Have knowledge how the graphics are stored, created and processed in computer systems, they are able to implement the basic primitives.
2. Write programs that demonstrate computer graphics animation.
3. Write programs that demonstrate 2D image processing techniques.

BCA Syllabus at JECRC University

Course Name: Software Engineering Lab

Course Code: BCA032A

L (Hr.)	T (Hr.)	P (Hr.)	C
0	0	2	2

Objective: Students would be able to:

1. Implement the concepts of software engineering.
2. Introduce software engineering and to explain its importance in building large programs, understand the process of developing new technology and the role of experimentation,
3. Set out the answers to key questions about software engineering, introduce ethical and professional issues and to explain why they are of concern to software engineers.

1. Problem Statement
Process Model
2. Requirement Analysis:
 - i. Creating a Data Flow
 - ii. Data Dictionary, Use Cases
3. Project Management:
 - i. Computing FP
 - ii. Effort
 - iii. Schedule, Risk Table, Timeline chart
4. Design Engineering:
 - i. Architectural Design
 - ii. Data Design, Component Level Design
5. Testing:
 - i. Basis Path Testing

Sample Projects:

1. Criminal Record Management : Implement a criminal record management system for jailers, police officers and CBI officers
2. DTC Route Information Online information about the bus routes and their frequency and fares.
3. Car Pooling: To maintain a web based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
4. Patient Appointment and Prescription Management System
5. Organized Retail Shopping Management Software
6. Online Hotel Reservation Service System
7. Examination and Result computation system
8. Automatic Internal Assessment System
9. Parking Allocation System.

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Implement the concepts of software engineering.
2. Have the understanding of the process of developing new technology and the role of experimentation.
3. Manage a project from beginning to end.

BCA Syllabus at JECRC University

Course Name: Multimedia Technology Lab

Course Code: BCA 033A

L (Hr.)	T/P (Hr .)	Pr (Hr.)	C
0	0	2	2

Objectives: Students would be able to:

1. Have foundation knowledge of multimedia computing, e.g. media characteristics, multimedia representation, data formats, multimedia technology development.
2. Be provided programming training in multimedia computing, multimedia system design and implementations.
3. Understand basics of multimedia tool FLASH. Implement motion and shape animation effect on objects using C language programming.

List of Experiments

1. Write a program to show a bitmap image on your computer screen.
2. Write a program to create a file splitter.
3. Write a program for tossing up a coin.
4. Write a program to produce animation effect of triangle transform into square and then into circle.
5. Write a program to draw a moving airplane using c.
6. Write a program to create motion effect. Using FLASH & Dreamweaver
 - a. Procedure to create an animation to represent the growing Moon.
 - b. Procedure to create an animation to indicate a ball bouncing on steps.
 - c. Procedure to simulate movement of a cloud.
 - d. Procedure to draw the fan blades and to give proper animation.
7. Procedure to create an animation with the following features. Represent the word —Good Morning|| with following effect
 - a. Letters should appear one by one
 - b. The fill color of the text should change to a different colour after the display of the full word.
8. Procedure to simulate a ball hitting another ball.
9. Procedure to display the background given (filename:Tullip.jpg) through your name using mask.
10. Procedure to change a circle into a square using flash.

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Use multimedia tool FLASH to develop applications.
2. Implement motion and shape animation effect on objects using C language programming.
3. Describe different realizations of multimedia tools and the way in which they are used.

BCA Syllabus at JECRC University

Course Name: Probability Theory and Statistical Computing

Course Code: BCA034A

L (Hr.)	T (Hr.)	P (Hr.)	C
3	1	0	4

Objectives: Students would be able to:

1. Know basic concepts of descriptive statistics, probability and their distributions, and inferential statistics and their applications in different areas.
2. Identify existing pattern of data and their applications.
3. Apply statistical tools and techniques in rational ways. Analyze the data scientifically and interpret them meaningfully

UNIT-I

Introduction to the notion of probability, Random experiment, Sample space & Events, Probability defined on events, Algebra of events, Conditional probabilities, Independent events, Bayes' theorem. Random Variables, cumulative distribution functions, probability mass/density functions,

UNIT-II

Discrete Random Variables (Binomial, Poisson and Geometric). Continuous Random Variables (Normal, Exponential, Uniform and Gamma). Expectation of a Random Variable (Discrete & Continuous cases). Expectation of Function of a Random Variable. Variance of a Random Variable. Jointly distributed Random Variables, Joint distribution functions, Independent Random Variables, Co-variance of Random Variables.

UNIT-III

Joint probability Distribution of Function of Random Variables, Moment Generating Functions. Introduction to Conditional Probability – Discrete and Continuous, Conditional Expectation, Matching Rounds Problem, Quicksort, Conditional Variance, Variance in Matching Rounds Problem, Best Prize Problem

UNIT-IV

Some more Applications: List Model, Random Graphs, Left Skip free random walks, Limits and bounds Markov inequality, Chebyshev's inequality, Chernoff's bound, Central Limit Theorem, Strong Law of Large Numbers.

UNIT-V

Markov Chains: Introduction to stochastic processes, Chapman–Kolmogorov equations, classification of states, Limiting and Stationery probabilities. Statistical Analysis: Simple Linear Regression Model, Linear Probabilistic Model, Estimating Model Parameters, Sample Correlation Coefficient, Inferences about the Population Correlation, Coefficient.

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Have knowledge of basic concepts of descriptive statistics, probability and their distributions, and inferential statistics and their applications in different areas.
2. Able to test the hypothesis using suitable statistical test.
3. Able to calculate coefficient of correlation and regression lines.

BCA Syllabus at JECRC University

Text Books

1. Sheldon Ross, Introduction to Probability Models, Tenth Edition, Academic Press/Elsevier, 2012.
2. Jay L. Devore, Probability and Statistics for Engineering and the Sciences, Eighth Edition, Cengage Learning, 2012.

Reference Books

1. K.S. Trivedi, Probability and Statistics with Reliability, Queuing and Computer Science Applications, Second Edition, Wiley, 2013.
2. James L. Johnson, Probability and Statistics for Computer Science, Wiley, 2008.
3. Jane Horgan, Probability with R: An Introduction with Computer Science Applications, Wiley, 2008.

Course Name: Seminar-IV
Course Code: BCA035A

L (Hr.)	T (Hr.)	P (Hr.)	C
3	0	0	3

A seminar on any technical topic.

BCA Syllabus at JECRC University

Course Name: Management Information Systems

Course Code: BCA036A

L (Hr.)	T (Hr.)	P (Hr.)	C
4	0	0	4

Objectives: Students would be able to:

1. Get the knowledge about the important management concepts & their application, to have an insight of various functional departments in an organization.
2. Discuss the importance of security, privacy, and ethical issues as they relate to information systems.
3. Identify some of the strategies employed to lower costs and improve service.

UNIT – I

STRATEGIC VIEW OF MIS: Management Information Systems in a Digital Firm, E-Business Enterprise: A Digital Firm, Strategic Management of Business Performance, Information Security Challenges in E-Enterprises, Information Technology: Impact on Society.

UNIT – II

BASICS OF MANAGEMENT INFORMATION SYSTEMS: Decision – Making Information, Knowledge, Business Intelligence,. Systems Engineering: Analysis and Design, Development Process of MIS, Strategic Design of MIS, Business Process Re-Engineering (BPR)

UNIT-III

APPLICATIONS OF MANAGEMENT INFORMATION SYSTEMS TO E-BUSINESS
Applications in Manufacturing Sector, Applications in Service Sector. Decision Support Systems and Knowledge Management. Enterprise Management Systems

UNIT-IV

INFOTECH INFRASTRUCTURE

Technology of Information Systems, Unified Communication and Networks, Database and Client Server Architecture. Data Warehouse: Architecture to Implementation E-Business Technology

UNIT-V

COMPREHENSIVE CASES ON MANAGEMENT INFORMATION SYSTEMS

Tata Home Finance Ltd. (A Comprehensive Case Study on MIS), Techno-Cases in E-Enterprise Management. Case Digest of SCM, FS Square Infotech Ltd. (FSIT) Home Land Groceries and Stores (HLGS)

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Apply critical thinking skills in decision making in the context of systems development.

BCA Syllabus at JECRC University

2. Compete in ethical reasoning and judgment addressing complexities in life and business.
3. Control costs by giving information about idle time, labor turnover, wastages and losses and surplus capacity.

TEXT BOOKS

1. Management Information Systems: Waman S Jawadekar
2. Dr. C.B Gupta —Management concepts & practices|| S.Chand& Sons, 2009.
3. Stoner,Freeman& Gilbert, —Management|| 6th Edition, Pearson International.

Semester – V

Course Name: Web Designing Techniques

Course Code: BCA037A

L (Hr.)	T (Hr.)	P (Hr.)	C
4	0	0	4

Objective:

1. To gain the skills and project-based experience needed for entry into web design and development careers.
2. To use a variety of strategies and tools to create websites.
3. To develop awareness and appreciation of the myriad ways that people access the web and will be able to create standards-based websites that are accessible and usable by a full spectrum of users.

Unit-I

The Internet – Basic of internet, file transfer, telnet, usenet, gopher, wais, archie and veronica. Basics of World Wide Web (WWW)

Web Servers, Browsers and Security – Web Browser and its architecture, The web server, the proxy server, How does web server work, How does web browser work, the fast ready connections on the web, web browsers, netscape communication suite, Microsoft internet explorer, the virus menace in the internet, firewalls, data security.

Unit-II

The World Wide Web (WWW): HTML History, Hypertext and Hypertext Markup Language.

HTML Documents: Tags, Elements of an HTML Document: Text Elements, Tag Elements, Structural elements of HTML documents, Header tags, Body tags, Paragraphs, Title.

List: Numbered list, Non-Numbered lists, Definition lists

Unit-III

Formatting HTML Documents: Logical styles (source code, text enhancements, variables), Physical Styles (Bold, Italic, underlined, crossed),

Managing images in html: Image format (quality, size, type), Importing images (scanners), Tags used to insert images.

Frames Tables in HTML documents: Tags used in table definition, Tags used for border thickness, Tags used for cell spacing, Tags used for table size, Dividing table with lines, Dividing lines with cells, Cell types: Titles cells, Data cells

Unit-IV

Hypertext and Link in HTML Documents URL/FTP/HTTP, Types of links: Internal Links, External Link, Link Tags, Links with images and buttons, Links that send email messages Special effects in HTML documents.

Unit-V

Web Designing with PHP (Introduction): Introduction to PHP, Installation of PHP and MySQL, PHP configuration in IIS & Apache Web Server and features of PHP, Writing PHP, How PHP code is parsed, Embedding PHP and HTML Executing PHP and viewing in Browser.

Text Books

1. Internet and web technology by Raj Kamal, TMH Publication
2. [Steven Holzner](#), [The Complete Reference PHP](#), Tata McGraw - Hill Education
3. [Steve Suehring](#), [Tim Converse](#), [Joyce Park](#), [PHP6 And My SQL Bible](#), Wiley India Pvt Ltd

Upon successful completion of this subject students should be able to:

1. Develop awareness and appreciation of the myriad ways that people access the web and will be able to create standards-based websites that are accessible and usable by a full spectrum of users.
2. Able to design front end web page and connect to the back end databases.
3. Understand the fundamentals of Web Hosting.

BCA Syllabus at JECRC University

Course Name: Programming in java

Course Code: BCA038A

L (Hr.)	T (Hr.)	P (Hr.)	C
4	0	0	4

Objectives: Students would be able to:

1. Be familiarizing with good design and programming.
2. Create Java programs that leverage the object-oriented features of the Java language, such as encapsulation, inheritance and polymorphism; use data types, arrays and other data collections.
3. Implement error-handling techniques using exception handling.

Unit-I

Java Fundamentals, Features of Java, OOPs concepts, Java virtual machine, Reflection byte codes, Byte code interpretation, Data types, variable, arrays, expressions, operators, and control structures, Objects and classes.

Unit-II

Java Classes: Abstract classes, static classes, Inner classes, Packages, Wrapper classes Interfaces, This, Super, Access control

Unit-III

Exception handling: Exception as objects, Exception hierarchy, Try catch finally, Throw, throws

Unit-IV

IO package: Input streams, Output streams, Object serialization, Deserialization, Sample programs on IO files, Filter and pipe streams.

Unit-V

Multi-threading: Thread Life cycle, Multi-threading advantages and issues, Simple thread program, Thread synchronization .GUI: Introduction to AWT programming, Layout and component managers, Event handling, Applet class, Applet life-cycle, passing parameters embedding in HTML

Learning Outcome:

Upon successful completion of this subject students should be able to:

1. Know the programming concepts and techniques using the Java language in a way appropriate for students without a programming background.
2. Create and event-driven GUI using Swing components; and implement I/O functionality to read from and write to text files.
3. Know the usage of Servlets and JSP.

Text Books

1. Programming with Java A Primer, E. Balaguruswamy Tata McGraw Hill Companies
2. Java Programming John P. Flynt Thomson 2nd
3. The complete reference JAVA2, Herbert schildt. TMH

BCA Syllabus at JECRC University

Course Name: Business Economics

Course Code: BCA039A

L (Hr.)	T (Hr.)	P (Hr.)	C
3	0	0	3

Objectives: Students would be able to:

1. Apply the basic theories of economics in critical thinking and problem solving.
2. Identify and use economics terminologies in oral and written communications.
3. Explain and analyze key principles of management: planning, organizing, leading, and controlling in business organizations.

UNIT I

The Scope and Method of Economics, The Economic Problem: Scarcity & Choice, The Price Mechanism, And Demand & Supply Equilibrium: The concept of Elasticity and its Applications.

UNIT-II

The Production Process: Output decisions – Revenues, Costs and Profit Maximization Laws of Returns & Returns to Scale; Economies and Diseconomies of Scale.

UNIT III

Market Structure: Equilibrium of a Firm and Price, Output Determination under Perfect Competition, Monopoly, Monopolistic Competition & Oligopoly.

UNIT IV

Macro-Economic Concerns: Inflation, Unemployment, Trade-Cycles: Circular Flow upto Four Sector Economy, Government in the Macro Economy: Fiscal Policy, Monetary Policy, Measuring National Income and Output.

UNIT V

The World Economy – WTO, Globalization, MNCs, Outsourcing, Foreign Capital in India, Trips, Groups of Twenty (G-20), Issues of Dumping, Export- Import Policy

Learning outcomes:

Upon successful completion of this subject students should be able to:

1. Demonstrate the ability to recognize when change is appropriate, to adapt to change as it occurs, and to take the lead in creating change as the country's economic environment changes.
2. Explain concepts of Financial Management for good governance of organization.
3. Understand the fundamentals of consumer behavior and analyze different case studies.

TEXT BOOKS:

1. Ahuja H.L., —Business Economics, S. Chand & Co., New Delhi, 2001
2. Karl E. Case & Ray C. Fair, —Principles of Economics, Pearson Education, Asia, 2000

BCA Syllabus at JECRC University

Course Name: Programming in Java lab

Course Code: BCA040A

L (Hr.)	T (Hr.)	P (Hr.)	C
0	0	2	2

Objectives: Students would be able to:

1. Implement the concepts of JAVA.
 2. Understand the concept of byte code, also they implement the programs and find the difference in C++, JAVA programming.
 3. Implement, compile, test and run Java programs.
-
1. Write a program that produces the following output:
Hello World!
—It's been nice knowing you —.
Goodbye world!
 2. State the order of evaluation of the operations in each of the following Java statements and implement them to show the value of x after each statement.
 $x = 7 + 3 * 6 / 2 - 1;$
 $x = 2 \% 2 + 2 * 2 - 2 / 2;$
 $x = (3 * 9 * (3 + (9 * 3 / (3))));$
 3. Write an application that declares 5 integers, determines and prints the largest and smallest in the group.
 4. Write an application that takes 3 parameters as sides of triangle and calculate area of triangle.
 5. Write an application that declares two integers, determines whether the first is a multiple of the second and print the result. [Hint: Use the remainder operator.]
 6. Write a program to find all prime numbers between 100 and 1000.
 7. Write a program to check whether the given number is palindrome or not.
 8. Write an application that evaluates the factorial of the integers from 1 to 5.
 9. Write a program that accepts an integer from user and check whether the number is Fibonacci number or not.
 10. Read a positive integer value, and compute the following sequence: If the number is even, halve it; if it's odd, multiply by 3 and add 1. Repeat this process until the value is 1, printing out each value. Finally print out how many of these operations you performed. Typical output might be:
Initial value is 9
Next value is 28
Next value is 14
Next value is 7
Next value is 22
Next value is 11
Next value is 34
Next value is 17
Next value is 52
Next value is 26
Next value is 13
If the input value is less than 1, print a message containing the word Error

Learning Outcome:

Upon successful completion of this subject students should be able to:

1. Know the programming concepts and techniques using the Java language in a way appropriate for students without a programming background.
2. Identify classes, objects, members of a class and the relationships among them needed for a specific problem.
3. Develop programs using the Java Collection API as well as the Java standard class library.

BCA Syllabus at JECRC University

Course Name: Microprocessor

Course Code: BCA041A

L (Hr.)	T (Hr.)	P (Hr.)	C
3	1	0	4

Objectives:

Students would be able to:

1. Learn architecture, addressing modes and programming of a typical 8-bit microprocessor.
2. Learn architecture and programming of typical 16-bit microprocessors.
3. Learn microprocessor interfacing and applications.

UNIT – I

Introduction to Microprocessors , microcontrollers and microcomputers, Study of 8085 8 bit Microprocessor, pin-out, its internal architecture, addressing modes, 8085 Microprocessor complete instruction set and timing. Arithmetic, logic , branch instructions, programming techniques- looping, counting, indexing, stacks and subroutines, code conversion, BCD Arithmetic.

UNIT - II

Counters and time delays using programming, Software development systems and assemblers, writing complete programs for 8085. Basic interfacing concepts, interfacing memory, interfacing keyboards and output displays , memory mapped and isolated I/O. Interrupts and their processing, 8259, Interrupt interface circuits using 8259.

UNIT - III

General purpose programmable peripheral devices-8255,8253 programmable interval timer,8257 DMA controller, serial I/O and data communication,RS-232C standard, Serial I/O lines, 8251A Programmable communications interface.

UNIT – IV

Introduction to 8086/8088 microprocessors, pin-out, architecture, segmented memory, timing diagrams, addressing modes, instruction set. Comparison of 8085, 8086, 8088 microprocessors

Learning Outcome: Upon successful completion of this subject students should be able to:

1. Analyze, specify, design, write and test assembly language programs of moderate complexity.
2. Select an appropriate ‘_architecture’ or program design to apply to a particular situation; e.g. an interrupt-driven I/O handler for a responsive real-time machine. the student will be able to design and build the necessary programs.
3. Identify and explain the operations of peripherals and memories typically interfaced with microprocessors and microcontrollers.

TEXT BOOKS:

1. Microprocessor Architecture, Programming & Application with 8085, Gaonkar, Penram Int. publication 2000.
2. Lyla B. Das,|| The X86 Microprocessors|| ,Pearson 2011

BCA Syllabus at JECRC University

Course Name: Microprocessor Lab

Course Code: BCA 042A

L (Hr.)	T/P (Hr.)	Pr (Hr.)	C
0	0	2	2

Objective : To understand the internal organization of INTEL 8086 Microprocessors, 8051 microcontroller and Assembly Language Programs using the instruction sets of processors and to study the interfacing of the processor with various peripheral devices.

- Write a program using Microprocessor 8086 to add two 8 bits numbers.
 - Write a program using Microprocessor 8086 to subtract two 8 bits numbers.
 - Write a program using Microprocessor 8086 to add two 16 bits numbers.
 - Write a program using Microprocessor 8086 to add ten 16 bits numbers with carry.
- Write an assembly language program to find whether the given number is even or odd.
 - Write an assembly language program to find the number of even and odd numbers from given series of 16 bit numbers.
 - Write an assembly language program to find the number of 1's in a given number.
 - Write an assembly language program to find whether the given number has even parity or odd parity.
- Write an assembly language program to find the largest number from an array of 16 bit numbers.
 - Write an assembly language program to find the smallest number from an array of 16 bit numbers.
 - Write an assembly language program to arrange the given array of 16 bit numbers in ascending order.
 - Write an assembly language program to arrange the given array of 16 bit numbers in descending order.
- Write an assembly language program to find the number of +ve and -ve numbers from given series of 16 bit numbers.
 - Write an assembly language program to perform 1 byte BCD addition
 - Write an assembly language program to perform addition, subtraction, Multiplication and Division of given operands. Perform BCD addition and subtraction.
 - Write an assembly language program to move 16 bytes from the offset 0200H to 0300H.
- Write an assembly language program to find whether the given byte is present in the string or not.
 - Write an assembly language program to compare two given strings.
 - Write an assembly language program to find square of the given number.
 - Write an assembly language program to find square of the given array of 16 bit number.
- Display a message — very large scale integration

- (b) Write an assembly language program to convert BCD number 0 to 9 to their 7 segment codes, using look up table.
- (c) Write an ALP for (i) addition and (ii) Multiplication of two 3x3 Matrices.
- 7. a) Write a program to calculate squares of BCD number 0 to 9 and store them sequentially from 2000H offset onward in the current data segment. The number and their square are in BCD format. Write a subroutine for the calculation of square of number.
- b) Write a program to change a sequence of 16 two byte number from ascending to descending order and store them in same data segment.
- 8. a) Write a program to generate a delay of 100ms using an 8086 system that runs on 10MHz frequency.
- b) Write a program to generate delay of 1Minutes.
- 9. (a) Write a program in 8051
 - (i) to clear the accumulator and add 3 to accumulator 10 times.
 - (ii) to load accumulator with the value 55H and complement the accumulator 700Times.
- b) Write a program to toggle all the bits of port1. put a time delay in between each issuing of data to port 1.
- 10. (a) Write a program to generate a delay of 1µsec. assuming that crystal frequency is 11.05MHz.
- b) Write a program in 8051 to perform the following
 - (i) Keep monitoring the port P2.2 bit until it becomes high
 - (ii) When it becomes high write a value 45H to port 0 send a high to low pulse to P3.3.
- 11. (a) Write a program to get X value from P1 and send X^2 to P2 continuously.
- b) Assume P1 is I/P port and connected to a temperature sensor. Write a program to read the temperature and test it for the value 75. according to test result place the temperature value into the registers indicated by the following
 - If $T = 75$ then $A = 75$
 - If $T < 75$ then $R1 = T$
 - If $T > 75$ then $R2 = T$
- 12. (a) Write a program to find number of 1's in given number.
- b) Write a program for conversion of packed BCD to ASCII
- 13. Write a program to Interface 7-segment LED displays to a microprocessor and displaying a real-time clock.
- 14. Write a program for the implementation of a traffic signal controller.
- 15. Write a program for implementation of a programmable frequency synthesizer using timers.
- 16. Write a program to interfacing ADC & DAC -capturing a waveform from signal generator and CRO display.
- 17. Write a program to interfacing a stepper motor to a 8051 microcontroller.

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Course Name: Software Project Management

Course Code: BCA043A

L (Hr.)	T (Hr.)	P (Hr.)	C
3	1	0	4

Objective: Students would be able to:

1. Do actions related to planning, organizing, leading, and controlling programs and projects and understanding of Strategy, organization and leadership in managing projects.
2. Deliver successful software projects that support organization's strategic goals.
3. Create project plans that address real-world management challenges.

UNIT I

Project Evaluation and Planning - Activities in Software Project Management, Overview of Project Planning, Stepwise planning, contract management, Software processes and process models. Cost Benefit Analysis, Cash Flow Forecasting, Cost-Benefit Evaluation Techniques, Risk Evaluation. Project costing, COCOMO 2, Staffing pattern, Effect of schedule compression, Putnam's equation, Capers Jones estimating rules of thumb.

UNIT II

Project Sequencing and Scheduling Activities, Scheduling resources, Critical path analysis, Network Planning, Risk Management, Nature and Types of Risks, Managing Risks, Hazard Identification, Hazard Analysis, Risk Planning and Control, PERT and Monte Carlo Simulation techniques

UNIT III

Monitoring And Control- Collecting Data, Visualizing Progress, Cost Monitoring, review techniques, project termination review, Earned Value analysis, Change Control, Software Configuration Management (SCM), Managing Contracts, Types Of Contracts, Stages In Contract Placement, Typical Terms of A Contract, Contract Management and Acceptance.

UNIT IV

Quality Management and People Management- Introduction, Understanding Behavior, Organizational Behavior, Selecting The Right Person For The Job, Motivation, The Old man – Hackman Job Characteristics Model, Working in Groups, Organization and team structures, Decision Making, Leadership, Organizational Structures, Stress, Health And Safety. ISO and CMMI models, Testing, and Software reliability, test automation

UNIT V

Overview of project management tools.

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Understand and practice the process of project management and its application in delivering successful IT projects.
2. Evaluate a project to develop the scope of work, provide accurate cost estimates and to plan the various activities.

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3. Understand and use risk management analysis techniques that identify the factors that put a project at risk and to quantify the likely effect of risk on project timescales.

Text Books

1. Bob Hughes, Mike Cotterell, —Software Project Management, Tata McGraw Hill. (2009)

Reference Books

2. Royce, —Software Project Management, Pearson Education. (2005).
3. Robert K. Wysocki, —Effective Software Project Management, Wiley.(2006)

BCA Syllabus at JECRC University

Course Name: Web Designing Techniques Lab

Course Code: BCA 044A

L (Hr.)	T/P (Hr.)	Pr (Hr.)	C
0	0	2	2

Objective: This course demonstrates an in-depth understanding of the tools and Web technologies necessary for business application design and development. The course covers client side scripting like HTML, JavaScript.

1. Create an admission form of your college which includes: College name and its website address that links to the website numbered list of various fields Check boxes,
2. Create form having image for photograph combo box and submit button
3. Design a set of web pages to organize the content on the topic ‘_Web Designing Techniques’ or any other topic of your choice using frames.
4. Create a table with different data in different rows and Head.
5. Create a form using different forms tag.
6. Create a page using different HTML tags with background images.
7. Put validation checks on all possible fields on admission form (Practical 1) using JavaScript.
8. Create an interactive multiple-choice quiz using JavaScript.
9. Create an HTML page for accepting a user ID and password from the user, and check if the user ID and password are correct.
10. Create own domain name and make a web site using different HTML tags.
11. Write a PHP program to store current date-time in a COOKIE and display the ‘_Last visited on’ date-time on the web page upon reopening of the same page.
12. Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on web page.

Upon successful completion of the Lab. course students should be able to:

1. The students will be able to learn & implement the Web Scripting for websites development.
2. The students will be able to learn & implement the XML and Javascipt for their dynamic web pages development.
3. The students will be able to learn & implement the CSS for webpages development.

Course Name: Minor Project

Course Code: BCA046A

L (Hr.)	T (Hr.)	P (Hr.)	C
0	0	8	8

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Course Name: Software Project Management Lab

Course Code: BCA 045A

L (Hr.)	T/P (Hr.)	Pr (Hr.)	C
0	0	2	2

1. Introduction to MS Project 2010
 - i. Understanding Projects
 - ii. Managing Projects & Project Management software
 - iii. Taking a first look at project – Starting Project, Entering information, Changing Views.
2. Creating a new project
 - i. Gathering Information
 - ii. Opening a Project file
 - iii. Establishing Basic Project Information
 - iv. Looking at Project Calendars
 - v. Entering Tasks
 - vi. Adding subtasks
 - vii. Saving Projects files, Working with project outline-Adjusting tasks in an outline, Copying task
3. Building Tasks
 - i. Establishing Timing for Tasks
 - ii. Assigning Task timing
 - iii. Using Recurring Tasks
 - iv. Establishing Constraints and deadline dates
 - v. Manipulating Gantt chart to view timing
 - vi. Entering Task notes
 - vii. Establishing Dependencies among tasks, Viewing Dependencies
4. Creating Resources & Assigning Costs
 - i. Understanding Resources, Creating Resources List, Modifying Resource Information, Using Resources and Tasks, Handling Costs.
 - ii. Understanding Basics of Views, Examine Indicators, Admiring Views ,Calendars, Detail Gantt Chart ,Leveling Gantt, Tracking Gantt, Multiple Baselines,
 - iii. Gantt Resource Allocation, resource Form, Resource Graph, Resource Name Form, Resource Sheet, Resource Usage, Roll up views, Task Details Form, Task Entry ,Task Form
5. Tracking Project progress
 - i. Understanding the principles of tracking, Using baseline, Changing Baseline, Viewing Progress with tracking Gantt Chart
 - ii. View Interpretation, Task Variance Table, Task Cost Table ,ask work Table ,Understanding Tracking Strategies.

SEMESTER-VI

Course Name: Programming in VB.net

Course Code: BCA047A

L (Hr.)	T (Hr.)	P (Hr.)	C
3	1	0	4

Objective: Students would be able to:

1. Get the Knowledge about different Object Oriented Features and to understand disconnected architecture of .Net.
2. To acquire knowledge on the usage of recent platforms in developing web applications.
3. Learn Visual Basic .NET to create graphical user interface applications.

UNIT I

Introduction: Introduction to .Net, Two tier and Three tier client server model, .NetArchitecture, Features of .Net, Advantages of .Net, .Net Framework, CLR, CTS, CLS,Assemblies, Memory management issues – Garbage Collector and collection process, ExceptionHandling, Code Access Security.

UNIT – II

Introduction to Visual Basic.Net IDE: Creating a project, Types of project in .Net, Exploringand coding a project, Solution explorer, toolbox, properties window, Output window, Object Browser.

UNIT-III

VB.Net Programming Language: Similarities and Differences with Visual Basic, Variables,Comments, Data Types, Working with Data Structures – Arrays, Array Lists, Enumerations,Constants, Structures; Introduction to procedures, calling procedures, argument passingmechanisms, scope of variable.Control Flow Statements – conditional statement Loops, Nesting of Loops, MsgBox andInput Box.

UNIT-IV

GUI Programming: Introduction to Window Applications, Using Form – Common Controls,Properties, Methods and Events. Interacting with controls - Textbox, Label, Button, Listbox,Combobox, Checkbox, Picture Box, Radio Button, Panel, scroll bar, Timer, ListView,TreeView, toolbar, Status Bar. Dialog Controls, Creating and Using MDI applications, Toolbar,Status Bar, Creating custom controls, Creating Menus. Object Oriented Features: Classes and Objects, Access Specifies: Private, Public andProtected, Building Classes, Reusability, Constructors, Inheritance, and Overloading, Overriding,Creating and Using Namespaces.

UNIT V

Introduction to ADO: ADO vs ADO.Net, ADO.Net data namespaces, ADO.Net Object Model, Accessing data from Server Explorer, Creating Connection, Command, Data Adapter,Data Reader and Data Set with OLEDB and SQLDB, Data Binding.

Learning Outcomes:

Upon successful completion of this subject students should be able to:

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1. Have knowledge of a new framework .NET, they are able to create application on this platform.
2. Access and manipulate data in a Microsoft Access or Microsoft SQL Server database by using Microsoft ADO.NET.
3. Create a simple Visual Basic .NET-based Web Forms application that uses an XML Web Service.

TEXT BOOKS

1. Visual Basic 2010 programming Black Book, by Kogent Learning Solutions, Wiley India
2. Visual Basic 2010 Step By Step, Michael Halvorson, PHI

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Course Name: Information Security

Course Code: BCA048A

L (Hr.)	T (Hr.)	P (Hr.)	C
4	0	0	4

Objective: Students would be able to:

1. Explain the objectives of information security
2. Analyze the trade-offs inherent in security
3. Describe the enhancements made to IPv4 by IPSec
4. Understand the basic categories of threats to computers and networks
5. Discuss issues for creating security policy for a large organization

UNIT I

Elements of Number Theory: Divisibility and Euclid Algorithm, Primes and the Sieve of Eratosthenes, testing for primes, Prime Number Theorem, Euler's, Fermat's Little theorems, Congruences, Computing Inverse in Congruences, Legendre and Jacobi Symbols, Chinese Remainder Theorem,

Algebraic Structures in Computing (Definitions, properties and Elementary Operations Only): Groups, subgroup, order of group, cyclic group, ring, field, division algorithm, polynomial over a field. Galois Field Elements of Information Theory: Entropy, redundancy of language, Key Equivocation & Unicity Distance, equivocation of a simple cryptographic system

UNIT II

Security Attacks: Active V/S Passive, Security Services, Security Mechanisms. Symmetric Cipher Model, Types of attacks on Encrypted messages. Classical Cipher Techniques: Caesar, Affine, Mono-alphabetic, Transposition, Polyalphabetic Ciphers Private Key Cryptosystems: Block Cipher Principles, Fiestel Cipher, Concept of 'Confusion' and 'Diffusion' in block ciphers, Product Ciphers, Lucifer Algorithm. DES Algorithm, DES modes of operations, IDEA. Differential & Linear Cryptanalysis (Introduction Only). S-box theory: Boolean Function, S-box design criteria, Bent functions, Propagation and nonlinearity, construction of balanced functions, S-box design. Link Vis End-to-End Encryption, Key Distribution in Symmetric Encryption

UNIT III

Public Key Cryptosystems: Principles of Public Key Cryptosystems, Factorization, RSA Algorithm, security analysis of RSA, Exponentiation in Modular Arithmetic. Key Management in Public Key Cryptosystems: Distribution of Public Keys, Distribution of Secret keys using Public Key Cryptosystems. Discrete Logarithms, Diffie-Hellman Key Exchange.

Message Authentication & Hashing: Birthday Paradox and General case of Duplications, Basic functions of Message Authentication and Hashing, Introduction to Hash & MAC algorithms.

UNIT IV

Digital Signatures: RSA Based, ElGamal Signatures, Undeniable Signatures. Authentication: Model of Authentication Systems, Impersonation, Substitution and spoofing games, Authentication schemes for mutual authentication based on shared secret, two-way public key, one-way public key, Mediated Authentication, One way Authentication.

UNIT V

X.509 Authentication Service: Certificates, Authentication Procedure, X.509 Version 3.E-Mail Security: PGP including management of keys in PGP, S/MIME. Network Security: IPSec, AH & ESP in Transport and Tunnel mode with multiple security associations (Key Management not Included). SSL (Protocols Only) Intrusion Detection: Audit Reports, Statistical Anomaly Detection, Rule based detection, honeypots, intrusion detection exchange formats. Password Protection: Lamport Hash, EKE Protocol.

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Understand the concepts of information security.
2. Learn about different attacks and countermeasures of information security.
3. Apply cryptographic algorithms for encrypting and decryption for secure data transmission.
4. Understand the importance of Digital signature for secure e-documents exchange.

Text Books

1. Stallings Williams: Cryptography and Network Security: Principles and Practices, 4th Edition, Pearson Education, 2006.
2. Kaufman Charlie et.al; Network Security: Private Communication in a Public World, 2nd Ed., PHI/Pearson.

Reference Books

1. Pieprzyk Josef and et.al; Fundamentals of Computer Security, Springer-Verlag, 2008.
2. Trappe & Washington, Introduction to Cryptography, 2nd Ed. Pearson.

BCA Syllabus at JECRC University

Course Name: Human Computer Interface

Course Code: BCA049A

L (Hr.)	T (Hr.)	P (Hr.)	C
4	0	0	4

Objectives: Students would be able to:

1. Know what the user-centered design cycle is and how to practice this approach to design your own website or other interactive software systems
2. Critique existing website and other interactive software using guidelines from human factor theories
3. Analyze one after another the main features of a GUI: the use of colors, organization and layout of content, filling the interface with useful and relevant information, and communication techniques; and to critique designs in order to provide better solutions

Unit-I

Introduction0 The human, The computer, The interaction, Paradigms, Usability of Interactive Systems, Guidelines, Principles, and Theories

Unit-II

Design Process- Interaction design basics, HCI in the software process, Design rules, Implementation support, Evaluation techniques, Universal design, User support

Unit-III

Models and Theories0 Cognitive models, Socio-organizational issues and stakeholder requirements, Communication and collaboration models, Task analysis, Dialogue notations and design, Models of the system, Modeling rich interaction

Unit-IV

Interaction Styles- Direct Manipulation and Virtual Environments, Menu Selection, Form Filling and Dialog Boxes, Command and Natural Languages, Interaction Devices, Collaboration and Social Media Participation

Unit-V

Design Issues- Quality of Service, Balancing Function and Fashion, User Documentation and Online Help, Information Search, Information Visualization Module6: Outside the Box- Group ware, Ubiquitous computing and augmented realities, Hypertext, multimedia, and the world wide web

Learning Outcomes: - Upon successful completion of this subject students should be able to:

1. Explain the human components functions regarding interaction with computer
2. Explain Computer components functions regarding interaction with human
3. Demonstrate Understanding of Interaction between the human and computer components.
4. Use Paradigms, implement Interaction design basics, Use HCI in the software process
5. Apply Design rules, Produce Implementation supports, Use Evaluation techniques

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Text Books:

1. —Human Computer Interaction by Alan Dix, Janet Finlay , ISBN :9788131717035, Pearson Education (2004)
2. —Designing the User Interface - Strategies for Effective Human Computer Interaction, by Ben Shneiderman ISBN : 9788131732557, Pearson Education (2010).

Reference Books:

1. Usability Engineering: Scenario-Based Development of Human-Computer Interaction , by Rosson, M. and Carroll, J. (2002)

BCA Syllabus at JECRC University

Course Name: Introduction to Cloud Computing

Course Code: BCA050A

L	T	P	C
(Hr.)	(Hr.)	(Hr.)	
4	0	0	4

Objectives: Get a clear understanding of Cloud Computing fundamentals and its importance to various organizations. Master the concepts of IaaS, PaaS, SaaS, Public and Private clouds. Get hands-on experience in Cloud Programming.

Unit I

Cloud Computing Fundamental: Cloud Computing definition, private, public and hybrid cloud. Cloud types; IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, public vs private clouds, role of virtualization in enabling the cloud; Business Agility: Benefits and challenges to Cloud architecture. Application availability, performance, security and disaster recovery; next generation Cloud Applications.

Unit II

Cloud Applications: Technologies and the processes required when deploying web services; Deploying a web service from inside and outside a cloud architecture, advantages and disadvantages

Unit III

Cloud Services Management: Reliability, availability and security of services deployed from the cloud. Performance and scalability of services, tools and technologies used to manage cloud services deployment; Cloud Economics: Cloud Computing infrastructures available for implementing cloud based services.

Unit IV

Economics of choosing a Cloud platform for an organization, based on application requirements, economic constraints and business needs (e.g Amazon, Microsoft and Google, Salesforce.com, Ubuntu and Redhat) Application Development: Service creation environments to develop cloud based applications. Development environments for service development; Amazon, Azure, Google App.

Unit V

Best Practice Cloud IT Model: Analysis of Case Studies when deciding to adopt cloud computing architecture. How to decide if the cloud is right for your requirements. Cloud based service, applications and development platform deployment so as to improve the total cost of ownership (TCO)

Learning Outcomes

BCA Syllabus at JECRC University

By the end of this course students are able to apply the concepts of cloud, they have the knowledge of cloud computing, have knowledge of cloud applications and services.

Text Books:

1. GautamShroff, Enterprise Cloud Computing Technology Architecture Applications
2. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach

BCA Syllabus at JECRC University

Course Name: PHP Programming
Course Code: BCA051A

L (Hr.)	T (Hr.)	P (Hr.)	C
4	0	0	4

Objective: Students would be able to:

1. Understand the basics of the PHP.
2. Examine how web pages are developed using PHP.
3. Learn certain specific PHP variables and syntax.

Unit-I

Introduction to PHP, Installation of PHP and MySQL, PHP configuration in IIS & Apache Web Server and features of PHP, Writing PHP, How PHP code is parsed, Embedding PHP and HTML Executing PHP and viewing in Browser.

Unit-II

Data types, Operators, PHP variables: static and global variables, Comments in PHP, Control Structures, Condition statements, If...Else, Switch, ? operator, Loops, While, Break Statement Continue. Do... While, For, For each, Exit, Die, Return

Unit-III

Arrays in PHP, Working With Data, FORM element, INPUT elements, Validating the user input, Passing variables between pages,

Passing variables through GET, Passing variables through POST, Passing variables through REQUEST, Working With Data, Built-in functions, String Functions: chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim, substr, strcmp, strcasecmp, strpos, strrpos, strstr, stristr, str_replace, strev, echo, print, Math Functions: abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand.

Unit-IV

Array Functions: count, list, in_array, current, next, previous, end, each, sort, rsort, asort, array_merge, array_reverse User Defined Functions. Sessions and cookies, Concept of Session Starting session, Modifying session variables, Un registering and deleting session variable Concept of Cookies.

Unit-V

Introduction of MySQL, Types of tables in MySQL, Query in MySQL: Select, Insert, Update, and Delete. Truncate Alias, Order By. Database connectivity of PHP with MySQL

Learning Outcomes: Upon successful completion of this subject students should be able to:

1. Use the basics of the PHP for developing applications.
2. Understand how PHP, HTML and MYSQL work together to produce dynamic pages.
3. Learn validation and I/O of forms using PHP.

References Books:

1. Core PHP Programming Leon Atkinson Pearson publishers
2. The Complete Reference PHP Stever Holzner McGraw Hill
3. Beginning PHP 5.0 Database Christopher Scollo, Harish, Rawat, Deepak Thomas, Wrox Press

BCA Syllabus at JECRC University

Course Name: PHP Programming Lab

Course Code: BCA052A

L (Hr.)	T (Hr.)	P (Hr.)	C
0	0	2	2

Objective: Students would be able to:

1. Learn the Web Designing.
 2. Examine how web pages are developed using PHP.
 3. Understand the basics of Perl programming.
-
1. Write a Perl program to display various Server Information like ServerName, Server Software, Server protocol, CGI Revision etc.
 2. Write a Perl program to accept UNIX command from a HTML form and to display the output of the command executed.
 3. Write a Perl program to accept the User Name and display a greeting message randomly chosen from a list of 4 greeting messages.
 4. Write a Perl program to keep track of the number of visitors visiting the web page and to display this count of visitors, with proper headings.
 5. Write a Perl program to display a digital clock which displays the current time of the server.
 6. Write a Perl program to insert name and age information entered by the user into a table created using MySQL and to display the current contents of this table.
 7. Write a PHP program to store current date-time in a COOKIE and display the `_Last visited on` date-time on the web page upon reopening of the same page.
 8. Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on web page.

Learning Outcomes:

Upon successful completion of this subject students should be able to:

1. Use the basics of the PHP for developing applications.
2. Understand how PHP, HTML and MYSQL work together to produce dynamic pages.
3. Learn validation and I/O of forms using PHP.
4. Get a job in software industry as web developer.

BCA Syllabus at JECRC University

Course Name: Programming in VB.Net Lab

Course Code: BCA053A

L (Hr.)	T (Hr.)	P (Hr.)	C
0	0	2	2

Objective: Students would be able to:

1. Learn the concepts of GUI.
 2. Implement the concepts of GUI in VB.Net
 3. Code the application in a new environment of GUI.
-
1. Create an application to accept a character from console and check the case of the character.
 2. Write a VB.Net program to accept any character from keyboard and display whether it is vowel or not.
 3. Write a VB .NET program to accept a string and convert the case of the characters.
 4. Develop a menu based VB .NET application to implement a text editor with cut, copy, paste, save and close operations.
 5. Write a program to implement the calculator with memory and recall operations.
 6. Develop a form in VB .NET to pick a date from calendar control and display the day, month, year in separate textboxes.
 7. Develop a VB .NET application to perform timer based quiz of 10 questions.
 8. Develop a VB .NET application using the File and Directory controls to implement a common dialog box.
 9. Develop a Database application to store the details of students using ADO.NET.
 10. Develop a Database application using ADO.NET to insert, modify, update and delete operations.
 11. Develop a VB.NET application using Datagrid to display record.
 12. Develop a VB.NET application using Datagrid to add, edit, and modify records.

Course Name: Major Project

Course Code: BCA054A

L (Hr.)	T (Hr.)	P (Hr.)	C
0	0	10	1 0

BCA Syllabus at JECRC University

Course Name: Accounting Principles and Practices
Course Code: BCA055A

L (Hr.)	T (Hr.)	P (Hr.)	C
3	0	0	3

Objectives: Students would be able to:

1. Know about the important concepts and characteristics of accounting.
2. Study the application of accounting in the general business environment.
3. To prepare the estimate for various business activities such as purchase, sale, production and cash budgets.

UNIT I

Meaning and nature of accounting, Scope of financial accounting, Interrelationship of Accounting with other disciplines, Branches of Accounting, Accounting concepts and convention, accounting standards in India.

UNIT – II

Journal, Rules of Debit and Credit, Sub Division of Journal: Cash Journal, Petty Cash Book, Purchase Journal, Purchase Return, Sales Journal, Sales Return Journal, Ledger, Trial Balance.

UNIT-III

Preparation of Final Accounts, Profit & Loss Account, Balance Sheet-Without adjustments and with adjustments.

UNIT – IV

Meaning of Inventory, Objectives of Inventory Valuation, Inventory Systems, Methods of Valuation of Inventories-FIFO, LIFO and Weighted Average Method, Concept of Depreciation

UNIT-V

Causes of Depreciation, Meaning of Depreciation Accounting, Method of Recording depreciation, Methods of Providing Depreciation.

Learning Outcome:

Upon successful completion of this subject students should be able to:

1. Get the Knowledge about the important concepts and characteristics of accounting.
2. Able to understand the budget preparation and control of a company.
3. Be prepared of fiscal policies of the organization.
4. Decide about the state of affairs of a particular firm/company.

TEXT BOOKS

1. Maheshwari, S.N. and Maheshwari, S. K., (2009) An Introduction to Accountancy, Eighth Edition, Vikas Publishing House.
2. Tulsian, P.C., (2009) Financial Accountancy, 2nd edition, Pearson Education.