ST.PHILOMENA'S COLLEGE (AUTONOMOUS), MYSURU

(AFFILIATED TO UNIVERSITY OF MYSORE)

REACCREDITED BY NAAC WITH A GRADE

COURSE –BCA

Three-year six semesters Choice Based Credit System (CBCS) and Continuous Assessment & Grading Pattern (CAGP) Under Graduate Programme under Autonomous Structure

UNDER GRADUATE COURSE – SEMESTER SCHEME

CBCS SYLLABUS

Academic year 2018-19 onwards

DEPARTMENT OF COMPUTER SCIENCE

GENERAL SCHEME WITH RESPECT TO ASSESSMENT OF CREDITS

COURSE –BCA

Three-year six semesters Choice Based Credit System (CBCS) and Continuous Assessment & Grading Pattern (CAGP) Under Graduate Programme under Autonomous Structure

A. SCHEME WITH RESPECT TO ASSESSMENT OF CREDITS TO DSC, DSE & SEC.

Semester	DSC	DSE	SEC	Total Credits	Total Marks
I	3+3+3+3+3= 15	-	-	15	500
II	3+3+3+3+3= 15	1x2=2	1x2=2	19	600
III	3+3+3+3+3= 15	1x2=2	1x2=2	19	600
IV	3+3+3+3+3+3 = 18	1x2=2		20	650
V	3+3+3+3+3+3+3+3= 24	1x2=2		26	850
VI	12+3+3=18	1x2=2	-	20	450
Total	105	10	04	119	3650

4.	SEC or OE	Skill Enhancement Course (SEC) or Open Elective

A. SCHEME WITH RESPECT TO ASSESSMENT OF CREDITS TO LANGAUGES AND FOUNDATION COURSES

Semester	Language		Foundation Course	Total Credits	Total Marks
	I	II			
I	4	4	3	11	400
II	4	4	3	11	400
III	4	4	3	11	400
IV	4	4	-	08	300
Total	16	16	9	41	1500

SCHEME OF STUDY AND EXAMINATION
I Semester

Title	Type	Teaching Hrs./Week		Credits	Duration in Hours /week	Max. Marks		
		Theory	Practical			Theory	I A	Total
Discrete Mathematics, Trigonometry and Calculus	DSC	03	-	03	03	70	30	100
ANY ONE 1. Fundamentals of Information Technology 2. Computer Fundamentals & Problem Solving	DSC	03	-	03				100
Problem Solving & Programming in C	DSC	03	-	03	03	70	30	100
Information Technology & Digital Electronics Lab	DSC	-	06	03	03	70	30	100
C Programming Lab	DSC	-	06	03	03	70	30	100
			Total	16				500

II Semester

Title	Type	Teaching Hrs./Week		Credits	Duration in Hours /week	Max. Marks		
		Theory	Practical			Theory	I A	Total
Algebra, Analytical Geometry and Integral Calculus.	DSC	03	-	03	03	70	30	100
Data Structures and Algorithms	DSC	03	-	03	03	70	30	100
Operating System / Computer Organization	DSC	03	-	03	03	70	30	100
Data Structures Lab	DSC	-	06	03	03	70	30	100
Operating System Lab	DSC	-	06	03	03	70	30	100
ANY ONE 1. Internet Technology 2. Computer Security 3. Computer Graphics 4. Software Engineering	DSE	02		02	02	30	20	50
SEC -I	SEC	02	-	02	02	30	20	50
			Total	19				600

III Semester

Title	Type	Theory	Practical	Credits	Duration in Hours /week	Theory	I A	Total
		Teaching Hrs./Week				Examination Scheme Max. Marks		
SAD/Software Engineering	DSC	03	-	3	03	70	30	100
DBMS	DSC	03	-	3	03	70	30	100
CPU Architecture &Microprocessor	DSC	03	-	3	03	70	30	100
Microprocessor Lab	DSC	-	06	3	03	70	30	100
DBMS Lab	DSC	-	06	3	03	70	30	100
ANY ONE 1. Web Designing 2. Data Analysis using AdvExcel 3. Access and Crystal Reports	DSE	02		2	02	30	20	50
SEC -II	SEC	02	-	02	02	30	20	50
		Total		19				600

IV Semester

Title	Type	Theory	Practical	Credits	Duration in Hours /week	Theory	I A	Total
		Teaching Hrs./Week				Examination Scheme Max. Marks		
OOPs with C#	DSC	03	-	3	03	70	30	100
Networking/Network Security & Cryptography	DSC	03	-	3	03	70	30	100
Computer Graphics	DSC	03	-	3	03	70	30	100
Numerical Analysis and Statistics	DSC	-	06	3	03	70	30	100
C# Lab	DSC	-	06	3	03	70	30	100
Numerical Analysis and Statistics Lab	DSC	-	06	3	03	70	30	100
ANY ONE 1. Biometrics 2. Python Programming 3. SoftwareTesting 4. Contentmanagement	DSE	02		2	02	30	20	50
		Total		20				650

V Semester

Title	Type	Teaching Hrs./Week Theory	Teaching Hrs./Week Practical	Credits	Duration in Hours /week	Max. Marks Theory	Max. Marks I A	Max. Marks Total
Java & Adv. Java	DSC	03	-	3	03	70	30	100
ASP.NET with C#	DSC	03	-	3	03	70	30	100
Data Warehouse and Data Mining	DSC	03	-	3	03	70	30	100
Elective – I- **ANY ONE** 1. System Software 2. Data Mining & Warehousing 3. Enterprise Resource Planning (ERP) 4. Operation Research.	DSC	03	-	3	03	70	30	100
Elective – II.**ANY ONE** 1. Multimedia Computing 2. Software Testing & Quality Assurance 3. Mobile Communication 4. Compiler Design	DSC	03	-	3	03	70	30	100
Java LAB	DSC	-	06	3	03	70	30	100
ASP.NET Lab	DSC	-	06	3	03	70	30	100
Elective Lab	DSC	-	06	3	03	70	30	100
ANY ONE 1. Mobile Technologies (5G,GPRS etc) 2. Database Testing 3. Network Security 4. Cryptography	DSE	02		2	02	30	20	50
Total				26				850

Elective – I	Elective – II
1. System Software	1. Multimedia Computing.
2. Data Mining & Warehousing	2. Software Testing & Quality Assurance.
3. Enterprise Resource Planning (ERP).	3. Mobile Communication.
4. Operation Research.	4. Compiler Design
5. Analysis& Design of Algorithms	5. Graph Theory
6. Web Designing & PHP	6. Software Testing & Quality Assurance

VI Semester

Title	Type	Theory	Practical	Credits	Durationin Hours /week	Theory / Dissertati	I A +Viva	Total
		Teaching Hrs./Week			Examination Scheme			
						Max. Marks		
Android Programming/ Python	DSC	03	-	3	03	70	30	100
Android lab / Python lab	DSC	-	06	3	03	70	30	100
Project Work	DSC	-	24	12	15 min	120	40+40	200
DSE – V ??	DSE/SC	02		2	02	30	20	50

Note: For Project work the teaching and examination scheme is given bellow

Title	Type	Theory	Project work.	Credits	IA Max.	Max.	Min.	Viva	Min. for Pass	Total
		TeachingHrs./Week			Examination Scheme					
						Dissertation				
Project Work	DSC	-	24	12	**40**	**120**	36	**40**	80	**200**

DISCIPLINE SPECIFIC ELECTIVE PAPERS

Semester		**Discipline Specific Elective papers for 2ⁿᵈ, 3ʳᵈ and 4ᵗʰ semesters**
II	B1	**1.** **Internet Technology**
II	B2	**2.** **Computer Security**
II	B3	**3.** **Computer Graphics**
II	B4	**4.** **Software Engineering**
III	C1	**1.** **Web Designing**
III	C2	**3.** **Data Analysis using Adv**
III	C3	**4.** **Access and Crystal Reports**
IV	D1	**1.** **Biometrics**
IV	D2	**2.** **Python Programming**
IV	D3	**3.** **Software Testing**
IV	D4	**4.** **Contentmanagement**
V	E1	**1.** **Mobile Technologies**
V	E2	**2.** **Database Testing**
V	E3	**3.** **Network Security**
V	E4	**4.** **Cryptography**

Note:

Sl .No	Type	
2.	**DSC or HC**	**Discipline Specific Core (DSC) or Hard Core (HC)**
3.	**DSE or SC**	**Discipline Specific Elective (DSE or /Soft Core (SC)**

******

TITLE: Discrete Mathematics, Trigonometry and Calculus
Class Duration : 16 Weeks. 3 Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

OBJECTIVE: This course is aimed to provide an introduction to the set theory, mathematical logic, trigonometry, and calculus.
OUTCOMES: At the end of this coursestudents can understand basicproperties, working rules of the set theory, logic, and calculus.

Unit 1	**Basics of set theory**	
1.1	Notations, Inclusions and equality of sets, the power set	
1.2	Operation on sets, Venn diagram, set identities	
1.3	Order pairs and n-tuples	
1.4	Cartesian product. Relation and ordering-properties of binary relations in a set	**10hrs**
1.5	Relation matrix and the graph of a relation	
1.6	Equivalence relations, compatibility relations	
1.7	Composition of binary relation.	
Unit 2	**Mathematical Logic**	
2.1	Statements and notation	
2.2	Connectives, negation, conjunction, disjunction,	
2.3	Statement formulas and truth tables	
2.4	Logical capabilities of programming languages,	**10hrs**
2.5	Conditional and bi-conditional, well formed formulas	
2.6	Tautologies, equivalence of formulas	
2.7	Duality law and tautological implication.	
Unit 3	**Trigonometry.**	
3.1	Radian measure of an angle ,trigonometric functions	
3.2	Heights and distances	**14 hrs**
3.3	Allied angles, addition and product formula	
3.4	Multiple and sub-multiple angle	
Unit 4	**Calculus.**	
4.1	Limits and continuity-Definitions, basic properties with examples and problems thereon.	
4.2	Differentiation –sum rule, product rule, quotient rule, chain rule	**14hrs**
4.3	Logarithmic differentiation.	
4.4	Differentiation of implicit functions and differentiation of parametric equations.	

Reference Books:
1. Discrete Mathematics by G K Ranganath
2. Discrete Mathematics by Chandrashekar Rao
3. Discrete Mathematics and its application by Kenneth H Rosen
4. Text book of Discrete Mathematics by Swapan Kumar Sarkar
5. Discrete Mathematics by Chakravarti Kumar

SYLLABUS
BCA SEMESTER-I
TITLE: Fundamentals of Information Technology
Class Duration : 16 Weeks with 3 Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Course Objectives

This is an introductory course that provides required knowledge about digital fundamentals of computer. The course covers few topics like number systems, logic gates and flips flops etc. The course starts with an introduction to number systems and its applications in computers. The discussion about working of devices like encoders and decoders, multiplexers and de multiplexers are dealt.

Learning Outcome

1. Ability to use math and Boolean algebra in performing computations in various number systems.

2. Simplification of Boolean algebraic expressions.

3. Ability to design efficient combinational and sequential logic circuit implementations from functional description of digital systems.

Unit 1   **20hrs**

1.1	Atomic structure, Energy of an electron, Valence Electrons, Voltage source.
1.2	**Semiconductor Materials:**Definition of a semiconductor. Types of semiconductors-Intrinsic and Extrinsic . P-type, N-type, P-N junction.
1.2.1	Transistor characteristics (configurations)-common base, common collector, common emitter. NPN transistor as a voltage amplifier.
1.2.2	Integrated Circuits: Integrated Circuits classification, Types of Integrated Circuits.
1.3	**Fundamentals of Gates**: Basic gates and Universal gates, combinational logic circuits, Half adder, Full adder, Half subtractor and Full subtractor.
1.3.1	Flip-Flops: SR, D, JK AND T Flip-Flops.Decoders: 3 to 8 lines.Encoders:Octal to Binary.Multiplexers:4 to 1 line.
1.3.2	**Boolean algebra:** Basic laws, Demorgan'stheorem,sum of product method and products of sum method. Karnaugh map.

Unit 2   18hrs

2.1	**Generations of computers, Characteristics of computers-** Speed, word length, storage, accuracy, versatility
2.2	**Classification of digital computers:**Microcomputers, Workstations, Portable computers- Laptop/ Notebooks, PDA's,Minicomputers, mainframe computers,Supercomputers.
2.3	**Anatomy of Computers:**Functions& Components of a Computer
2.3.1	**Memory Units:**RAM-static,dynamic, ROM- PROM, EPROM, EEPROM,Difference between RAM and ROM.Cache memory , flash memory.
2.3.2	**Auxiliary storage devices :**Magnetic tape, Hard disk, Floppy disk, Optical disk, CD-ROM, Magneto Optical disk drives.
2.3.3	**Input devices:**Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, scanners, digital camera, Magnetic Ink character recognition(MICR), Optical Mark recognition(OCR), Bar code reader, speech input devices, Touch screen, Touch pad, light pen.
2.3.4	**Output devices :**Monitor, classification of Monitors, **Type of Printers-** Daisy wheel printer, Dot matrix printer, Ink-Jet printer, Laser

printer, LCD & LED printers, Line printer, Thermal printer, Plotter, Sound cards and speakers   .

2.4 **Number systems:** Decimal number systems, Binary number systems, Compliments, Gray code, Excess-3 code, ASCII Code, EBCDIC Code, Bits, bytes and words, Octal number system,hexadecimal number system.

2.5 **Programming languages :**Low Level language-machine language and assembly language.High-level language- procedural oriented languages and application Generators. Compilers, assemblers and Interpreters

Unit 3   10 hrs

3.1 **Operating System Fundamentals:**
Definition for an operating system,Types of operating system, Functions of an operating system-memory management,I/O management,Filemanagement,Process management ,Information management and security.

3.2 **Network Fundamentals:** Networking basics, Need for networking,types of networks, Basic components of a network,Network topologies.

3.3 **Database Management Systems:**Basics of database,DBMS,field,Record,File,Database languages-DML,DDL .

3.4 **E-Commerce Basics :** EDI the original method, Types of e-Commerce, benefits and limitation of e-commerce, cyber banking, electronic payments, e-governance, m-commerce, security in electronic payments

Text Books
1 'Introduction to Computers'. Peter Norton, Second edition, TMH.
2. Computer Fundamentals - P K Sinha,BPB
3. Principles of Electronics-V.K.Mehtha.

Reference Books
1. Introduction to Computers - N Subramanian,TMH
2. Understanding Computers - R Rajagopalan. TMH
3. Computers Today - Donald Sanders, MGH
4. Computers Today - Suresh K Basandra, Galgotia
5. Digital fundamentals-Thomas.D.Floyd.
6. Basic Electronics – G.K.Mithal

****

BCA SEMESTER-I
TITLE: Information Technology and Digital Electronics Lab
Class Duration : 16 Weeks with 6 Hours a week = 96 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

1BCA: Exercises should be based on IBCA3 & IBCA5.
Part A:
1. Using Ms-Word with suitable examples, write the steps and execute the following with respect to table handling

1.Creating a table (At least 4 Columns and 6 Rows).

2.Entering appropriate data into the table.

3.Sort the table.

4.Apply the formulas on table numeric values.

2. Using Ms-Word write the steps and execute for creating "Mail Merge" document for "FORM LETTERS".

3. Using Ms-Excel spread sheet, with suitable example, write steps and create worksheet called "Employee" and calculate the following using formulas

     1. Enter Employee Code, Name and Basic Salary.

     2. Calculate DA (20% of Basic Salary).

     3. Calculate HRA (10% of Basic Salary).

     4. Calculate CCA (8.5% of Basic Salary).

     5. Calculate Total Salary (Basic Salary + DA + HRA + CCA)

     6. Calculate Deductions (10% of Total Salary).

     7. Calculate Net Salary (Total Salary – Deductions).

4.UsingMs-Excel draw X-Y Line Chart and Bar Charts based on the following worksheet data and write the steps

ITEM	MONTHLY SALES (in Thousands)
Cotton	2,750
Wool	3,100
Yarn	2,975
Jute	2,100
Fiber	3,010

5.UsingMs-Excel spreadsheet write the steps and execute the following:

RollNo StudName Marks1   Marks2 Mark3 Total Percentage   Result

     1. Create appropriate records

     2. Calculate total and marks using formula.

     3. Update result column using IF function.

(Result: Distinction, First Class, Second Class, Pass, Fail).

6. Using Ms-Access with suitable examples write steps and execute the following.

     1. Create STUDENT database table.

     2. Create appropriate records.

     3. Add two more records to the table.

     4. Delete 2nd record to the table.

     5. View the records.

7. Using Ms-Access with suitable examples write steps and execute the following.

     1. Create EMPLOYEE database table.

     2. Create appropriate records.

     3. Sort the records in ascending order of name.

     4. Sort the records in descending order of salary.

     5. View the records

8. Using Ms-PowerPoint with suitable examples write steps and execute the following:
    1. Create presentation slides with Titles, Sub Titles and Charts choosing different slide layouts.

    2. Use Design templates for background.

    3. Format the slide design.
9. Using Ms-PowerPoint with suitable examples write steps and execute the following:
    1. Create presentation table slides using an organization chart.

    2. Use different views such as slide view, slide sorter view and slide show view.

Part B:

1. Verification of Basic Gates (OR, AND, NOT) and EX-OR, EX-NOR.

2. Verification of Other Gates using only NAND Gates (Universal Gate).

3. Verification of other Gates using only NOR Gates (Universal Gate).

4. Realization of Boolean expression using NAND gates only.

5. Construction of Half Adder and Full Adders.

6. Construction of Half Subtractor and Full Subtractors.

7. Simplification of Boolean Expressions using Karnaugh Map method.

8. Implementation of SR, Clocked SR Flip Flops.

9. Implementation of JK, Toggle and Delay Flip Flops.

10. Shift Left and Shift Right Registers.

11. 4 bits Gray to Binary and Binary to Gray Converter.

12. Decimal to BCD encoder and BCD to decimal decoder.

******

BCA SEMESTER-I
TITLE: Computer Fundamentals & Problem Solving
Soft Core
Class Duration : 16 Weeks with 3 Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Course Objectives: This is an introductory course that provides required knowledge about digital fundamentals of computer, Computer Hardware ans software.

Learning Outcomes: At the end of the course the student will get the basic Knowledge of functioning of ComputersComputer hardware, Number System and Types of Software and their applications

Unit 1   **20hrs**

1.1 **Introduction to Computers**
History, Generations of Computers
Computer as multipurpose tool - Overview of the Computer system, Applications of computer, looking inside the machine, parts of the computer, information processing cycle, computer shapes and types of computer.

1.2 **Interacting with Computer**
The Keyboard - the mouse - other input devices - The monitor - Printers - Sound systems - Connecting I/O devices to the Computer.

1.3 **Storing information in a Computer**
Types of storage devices - Magnetic storage devices, Optical Storage devices, measuring device performance.

2.1 **Generations of computers, Characteristics of computers-** Speed, word length, storage, accuracy, versatility

2.2 **Classification of digital computers:** Microcomputers, Workstations, Portable computers- Laptop/ Notebooks, PDA's, Minicomputers, mainframe computers, Supercomputers.

2.3 **Anatomy of Computers:** Functions& Components of a Computer
Memory Units: RAM-static, dynamic, ROM- PROM, EPROM, EEPROM, Difference between RAM and ROM. Cache memory , flash memory.

2.3.1 **Auxiliary storage devices :** Magnetic tape, Hard disk, Floppy disk, Optical disk, CD-ROM, Magneto Optical disk drives.

2.3.2 **Input devices:** Keyboard, Mouse, Trackball, Joystick, Digitizing tablet, scanners, digital camera, Magnetic Ink character recognition(MICR), Optical Mark recognition(OCR), Bar code reader, speech input devices, Touch screen, Touch pad, light pen.

2.3.3 **Output devices :** Monitor, classification of Monitors,

2.3.4 **Type of Printers-** Daisy wheel printer, Dot matrix printer, Ink-Jet printer, Laser printer, LCD & LED printers, Line printer, Thermal printer, Plotter, Sound cards and speakers .

2.4 **Number systems:** Decimal number systems, Binary number systems, Compliments, Gray code, Excess-3 code, ASCII Code, EBCDIC Code, Bits, bytes and words, Octal number system, hexadecimal number system.

2.5 **Programming languages :** Low Level language-machine language and assembly language. High-level language- procedural oriented languages and application Generators. Compilers, assemblers and Interpreters

Unit 3   **10 hrs**

3.1 **Operating System Fundamentals:**
Definition for an operating system, Types of operating system, Functions of an operating system-memory management, I/O management, Filemanagement, Process management , Information management and security.

3.2 **Network Fundamentals:** Networking basics, Need for networking, types of networks, Basic components of a network, Network topologies.

3.3 **DatabaseManagementSystems:** Basicsofdatabase, DBMS, field, Record, File, Database

languages-DML,DDL .
3.4 **E-Commerce Basics :** EDI the original method, Types of e-Commerce, benefits and limitation of e-commerce, cyber banking, electronic payments, e-governance, m-commerce, security in electronic payments

Text Books
1 'Introduction to Computers'. Peter Norton, Second edition, TMH.
2. Computer Fundamentals - P K Sinha,BPB
3. Principles of Electronics-V.K.Mehtha.

Reference Books
1. Introduction to Computers - N Subramanian,TMH
2. Understanding Computers - R Rajagopalan. TMH
3. Computers Today - Donald Sanders, MGH
4. Computers Today - Suresh K Basandra, Galgotia
5. Digital fundamentals-Thomas.D.Floyd.
6. Basic Electronics – G.K.Mithal

******

BCA SEMESTER-I

TITLE: Problem solving and programming in 'C'
Hard Core
Class Duration : 16 Weeks with 3Hours a week = 48Hrs
MARKS THEORY 70+ INTERNAL ASSESSMENT 30 = 100

Course Objectives
1. The course provides students with a comprehensive study of C programming language. The course lectures stress the strengths of C, which provides the outcome of writing efficient, maintainable and portable code.
2. Course includes few lab exercises to make sure the student has not only gained the knowledge but can also apply and execute it.
3. To study about algorithms, flowcharts and programs.
4. To solve problems through logical thinking.

Learning Outcome
1. To clearly understand the logic of the problem.
2. To analyze the given problem and write the algorithm, flowchart.
3. To write structured C programs, this is the foundation of any programming language.

Unit 1 16hrs

1.1 **Problem solving aspects** – Introduction, Problem definition, Problem analysis, Design of problem solution,Algorithm, Flowchart, Coding, Debugging, Program Documentation and Program maintenance, Basic programming constructs - sequence, selection and iteration.

1.2 **Overview of C**

Importance of C, Sample C programs, Basic structure of C Programs, Programming style, executing a C Program.

1.3 **Constants, Variables, and Data Types**

Character set, C tokens, Keywords and identifiers, Constants, Variables, Data types, Declaration of variables, Assigning values to variables ,Defining symbolic constants

1.4 **Operators and Expression**

Arithmetic of Operators, Relational operators, Logical operators Assignment operators, Increment and decrement operators, Conditional operator, Bit wise operators, Special operators

Arithmetic expressions, Evaluation of expressions, Precedence of arithmetic operators, Type conversions in expressions, Operator precedence and associatively,

1.5 Mathematical functions.

Managing Input and Output Operations
Reading a character, writing a character, formatted input, formatted output

Unit 2 18 hrs

2.1 **Decision Making and Branching**

Decision making with IF statement, Simple IF statement, The IF ELSE statement, Nesting of IF ... ELSE statements, The ELSE IF ladder, the switch statement,the?: Operator, The GOTO statement.

2.2 **Decision Making and Looping**

The WHILE statement, The DO statement, The FOR statement, Jumps in loops

2.3 **Arrays** One-dimensional arrays, Two-dimensional arrays, Initializing two-dimensional arrays.
Handling of character strings Declaring and initializing string variables, Reading strings from terminal, Writing strings to screen, Arithmetic operations on characters, Putting strings together Comparison of two strings, String-handling functions, Table of strings

2.4 **User-Defined Functions**
Need for user-defined functions, multi-function program, The form of C functions Return values and their types, Calling a function Category of functions, Handling of non-integer functions, Nesting of functions, Recursion, Functions with arrays, The scope and lifetime of variables in functions.

Unit 3   **16 hrs**

  3.1   **Structures and Unions**

        Structure definition, giving values to members, Structure initialization

        Comparison of structure variables, Unions, Size of structures

  3.2   **Pointers and File Handling**

        Understanding pointers. Accessing the address of a variable, Declaring and
        initializing pointers, Accessing a variable through its pointer,
        Introduction to File Processing, I/O operations

Text Books

1. Programming in ANSI C by E Balagurusawmi , 2nd Edition Published by Tata McGraw Hill.

Reference Books

 1. Computer Programming in C by V Rajaraman, PHI, NewDelhi, 1995.

 2. Programming in C by Hutchison.R, McGraw Hill, New York, 1990.

 3. Application program in C by Johnsonburgh, R and Kalin,M.

*****

BCA SEMESTER-I
TITLE: C Programming Lab
Class Duration : 16 Weeks with 6 Hours a week = 96 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Part A:

1. C program for given two numbers to perform arithmetic operations using switch statement.
2. C program to find biggest of three number using nested if statement.
3. C program to find sum of the S=12 +22+32+..........+n2 indirect method using looping statement
4. C program to find sum of the S=1-2+3-4+5……+n series by indirect method using looping statement
5. C program to find sum of the S=1+1/x+1/x2..............series upto 4 decimal places of accuracy.
6. C program to check whether the given number is prime or not.
7. C program to print and count prime numbers from 2 to n.
8. C program to generate Fibonacci series up to n numbers
9. C program to check whether the given number is factorial of a number or not
10. C program to convert binary number to decimal number.
11. C program to convert decimal number to binary number.
12. C program to find the roots of the quadratic equation using else if statement.
13. C program to find the reverse of the given number. Also sum & count the number of digits and
     check whether the given number is palindrome or not palindrome
14. C program to find largest and smallest of n numbers
15. C program to find second largest and second smallest of n numbers

Part B:

1. C program for sorting given set of numbers using bubble sort technique.
2. C program to search given number using linear search technique

3. C program to accept two square matrix and find sum of two matrices.
4. C program to print difference of two matrices.
5. C program to accept two matrices of order m*n and p*q to findtheir product using function.
6. C program to check whether given number is Fibonacci or not.
7. C program to accept m*n matrix. To find trace and norm of square matrix and to print principle diagonal elements
8. C program to accept m*n matrix to find sum of upper diagonal and lower diagonal elements.
9. C program to find factorial of a number using recursive function
10. C program to find NCR and NPR using function.
11. C program to find LCM and GCD of two numbers.
12. C program to display transpose of given m*n matrix using function.
13. C program to swap two numbers using function and pointers.
14. C program to accept employee information and display the same using structure.
15. C program to create simple marks card assuming appropriate condition
16. C program to read and write information of an employee using a file.

******

SYLLABUS
BCA SEMESTER-II
MATHEMATICS
TITLE: Algebra, Analytical Geometry and Integral Calculus.
Class Duration : 16 Weeks. 3 Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

OBJECTIVE: This course is aimed to provide a basic knowledge about integral calculus, fundamentals of graph theory with basics of algebra.

OUTCOMES: At the end of this course students can apply his skill in solving the problems of integral calculus and he can apply his analytical knowledge solving graph theory and algebra problems.

Unit 1	**Basics of Algebra.**	
1.1	Introduction.	
1.2	Partial fraction, logarithms	**10 hrs**
1.3	Mathematical induction, binomial theorem	
1.4	Matrices and determinants	
Unit 2	**Graph Theory.**	
2.1	Basics definitions, paths, connectivity	
2.2	Matrix representation of graphs-	**10hrs**
2.3	Adjacency matrix, Incidence matrix, cycle matrix.	
2.4	Trees- definitions, types of trees and distance concepts.	
Unit 3	**Analytical Geometry.**	
3.1	Points- section formula, distance formulae, area of a triangle in point form.	
3.2	Straight lines-slope of a line, parallel and perpendicular lines, deferent forms of lines	**14 hrs**
3.3	Circle-Equation of a circle with center as origin	
3.4	Equation of a circle with center as other than origin, general equation of a circle	
3.5	Tangent to the circle and length of the tangents.	
Unit 4	**Integral Calculus**	
4.1	Introductions, Indefinite integrals, integration by parts	
4.2	integration by method of substitution, integration by using partial fraction	

4.3 Evaluation of

$$\int \frac{1}{a^2+x^2}\,dx, \int \frac{1}{a^2-x^2}\,dx, \int \frac{1}{x^2-a^2}\,dx, \int \frac{1}{\sqrt{a^2-x^2}}\,dx, \int \frac{1}{\sqrt{a^2+x^2}}\,dx, \int \frac{1}{\sqrt{x^2-a^2}}\,dx.$$

14hrs

4.4 Integrals of the form $\int \frac{dx}{ax^2+bx+c}, \int \frac{(px+q)dx}{ax^2+bx+c}, \int \frac{dx}{\sqrt{ax^2+bx+c}}, \int \frac{(px+q)dx}{\sqrt{ax^2+bx+c}}.$

4.5 Integrals of the form

$$\int \frac{dx}{a+b\cos x}, \int \frac{dx}{a+b\sin x}, \int \frac{dx}{a\cos x+b\sin x+c}, \int \frac{(p\cos x+q\sin x)dx}{a\cos x+b\sin x+c}.$$

4.6 Introductions to definite integrals.

Reference Books:
1. PU Text books prescribed by NCERT
2. A text book of Mathematics by G K Ranghanath
3. Analytical Geometry by Shanthi Narayan
4. Graph Theory by V R Kulli
5. Graph Theory by S Arumugam
6. Integral Calculus by Shanthi Narayan

BCA SEMESTER-II
TITLE: Data Structures and Algorithms
Hard Core
Class Duration : 16 Weeks with 3 Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Course Objectives

1. Data Structure is considered as one of the fundamental paper towards a more comprehensive understanding of programming and application development.
2. Student is expected to work towards a sound theoretical understanding of Data Structures and also compliment the same with hands on implementing experience.
3. To be able to practically implement the data structures like stack, queue, array etc.
4. To understand and implement different searching and sorting techniques.

Learning Outcome

1. Understand the need for Data Structures when building application.
2. Appreciate the need for optimized algorithm.
3. Able to walk through insert and delete for different data structures.
4. Ability to calculate and measure efficiency of code .
5. Appreciate some interesting algorithms like Huffman, Quick Sort, and Shortest Path etc.
6. Able to walkthrough algorithm.
7. Improve programming skills.

Unit 1   **20hrs**
1.1 Linear Data Structure and their sequential storage representation
1.2 Algorithmic notation, Concept and terminology for non-primitive Data structures, Storage structures for arrays, Structures and arrays of structures, Stacks, Definitions
1.3 and Concepts, Operations on stacks, Applications of stacks, Recursion, Infix to postfix, Evaluating postfix expressions,
1.4 Queues, Priority Queues
1.5 Linear Data Structure and their Linked storage representation
1.5.1 Pointers and Linked Allocation, Linked linear lists, Operations on Linear lists using singly linked storage structures,
1.5.2 Circularly linked linear lists, Doubly linked linear lists

Unit 2   **14hrs**
2.1 Nonlinear Data Structures
2.1.1 Trees - Definition and concepts, Operations on Binary Trees, Linked Storage Representations of Binary Trees,
2.1.2 Tree creation and Traversal
Unit 3   **14hrs**
3.1 Sorting and searching
3.1.1 Sorting, Selection sort, Bubble sort, Merge sort, Quick sort, Radix sort, Searching,
3.1.2 Sequential searching, Binary searching, Search Tree

Text Books

1. An Introduction to Data Structures with Applications - J.P.Trembly and Sorenson, 2nd edition McGraw Hill 2001.

Reference Books

1. Data structures using C & C++ by YedidyahLangsun, Moshe J Augenstein, Teneinbaum published by Prentice Hall of India Ltd.
2. Algorithms + Data Structures = Programs by Niklaus Wirth Prentice Hall 1976.
3. Data structures and algorithms by Aho, A.V.,Hopcroft and Ullman,J.E., Addison Wesley, 1980.
4. Fundamentals of data structures by Horowitze,E and Sahni,S., Galgotia bookstore.
5. Data structures and program design by Robert,L.Krunse, PHI.
6. Data and File structures by Mary Lunis, PHI.
7. Theory and problems of Data structures by Seymour Lipshutz, McGraw Hill.

******

BCA SEMESTER-II

TITLE: 2BCA7: Data Structure Lab
Hard Core
Class Duration : 16 Weeks with 6 Hours a week = 96 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Exercises should be based on 2BCA5.

PART -A

1. Write an interactive program to search an element in the given linear array using linear and binary searching technique and estimate the time and space.
2. Write a program to arrange numbers in ascending order using selection sort
3. Write an interactive program to insert an element at the given position and delete an element at the specified position in the given array.
4. Write an interactive program to implement the following operations on stack
5. Program to implement Tower of Hanoi problem.
6. Write a program to arrange numbers in ascending order using merge sort.
7. Write a program to arrange numbers in ascending order using insertion sort.
8. Write a program to arrange numbers in ascending order using quick sort
9. Write program to evaluate a postfix expression.
10. Write a program to convert an expression from infix to postfix.
11. Write an interactive program to perform insertion and deletion operations in Linear Queue.

PART -B

12. Write an interactive program to perform insertion and deletion operations in Circular Queue.
13. Write a program to create a linked list .
14. Write a program which finds the location of an item in the unsorted linked list.
15. Write a program to insert a node in a linked list at the front end.(beginning)
16. Write a program to insert a node in a linked list anywhere in between
17. Write a program to delete an item from the linked list.
18. Write a an interactive program to implement stack operations using singly linked list.
19. Write a an interactive program to implement queues operations using singly linked list.

20. Program to create a binary tree and also print the preorder values.
21. Program to create a binary tree and also print the inorder values.
22. Program to create a binary tree and also print the postorder values.
23. Program to add two polynomials of one variable and 'n' degree and represent them as linked list (DEMONSTRATION ONLY)

*****

BCA SEMESTER-II
TITLE: Operating Systems(2BCA6)
Hard Core
Class Duration : 16 Weeks with 3 Hours a week = 48Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Course Objectives
1. This course is an introduction to the concept behind modern computer operating systems. Topics will include what an operating system does (and doesn't) do, system calls and interfaces, processes, concurrent programming, resource scheduling and management (of the CPU, memory, etc.), virtual memory, deadlocks, distributed systems and algorithms, networked computing and programming, and security.
2. To acquire the fundamental knowledge of the operating system architecture and components
3. To know the various operations performed by the operating system.

Learning Outcome
1. Understand the basic working process of an operating system.
2. Understand the importance of process and scheduling.
3. Understand the issues in synchronization and memory management.

Unit 1   **16 hrs**

1.1   **Fundaments of Operating System** :An introduction, History, Types of operating system, multi-user, single user, batch systems, multitasking, multiprogramming, real time systems,

1.2   **Operating system functions/services:** System calls, System programs Memory Management - Swapping, Single contiguous technique, Partitioned allocation, Paging, Segmentation with paging Demand Paging
Process management : Process concept, Process state, Process control block

CPU scheduling : CPU I/O burst cycle, CPU schedulers, Scheduling queues, **16 hrs**
Scheduling criteria
Scheduling algorithms: FIFS Scheduling, SJF Schedulers, Priority Scheduling, Round Robin Scheduling
Process Synchronization: Spooling, Semaphores
Deadlocks: Characterization, Methods for handling deadlocks, Deadlock Prevention-mutual exclusion, hold and wait, no pre-emption, Circular wait, Deadlock avoidance-Safe State, Banker's algorithm, Deadlock detection-Single and several instances of resource type.
Device Scheduling: Disk scheduling, FCFS, SSTF(Shortest Seek time first), Disk Management, formatting, Swap space management, use, location

Unit 3   **16 hrs**
3.1   **LINUX/ UNIX :** Introduction to Unix, Account in Unix, Started with (X/Motif),

CDE,

3.1.1   UNIX Architecture, Features of Unix, File system in Unix, Files and Processes, Directory Structure, Starting with Unix terminal and Commands .

3.1.2   **Text editors:** VI Editor(Starting with vi, Operation Modes of vi, Getting out of vi, Moving within a file in vi, Control commands in vi, Editing files, Deleting Characters, Change Commands, Copy and Paste Commands, Advanced Commands, Word and Character Searching, Set Commands, Running Commands). Programming in UNIX using Shell scripts: Using Shell Variables(variable name,

3.2   defining variables, Accessing values), Shell Basic Operators, Shell Decision Making, Shell Loops.

Text Books

1. An Introduction to Data Structures with Applications - J.P.Trembly and Sorenson, 2nd edition McGraw Hill 2001

Reference Books

1. Data structures using C & C++ by YedidyahLangsun, Moshe J Augenstein, Teneinbaum published by Prentice Hall of India Ltd.
2. Algorithms + Data Structures = Programs by Niklaus Wirth Prentice Hall 1976.
3. Data structures and algorithms by Aho, A.V.,Hopcroft and Ullman,J.E., Addison Wesley, 1980.
4. Fundamentals of data structures by Horowitze,E and Sahni,S., Galgotia bookstore.
5. Data structures and program design by Robert,L.Krunse, PHI.
6. Data and File structures by Mary Lunis, PHI.
7. Theory and problems of Data structures by Seymour Lipshutz, McGraw Hill.

BCA SEMESTER-II

TITLE: Computer Organization (2BCA6)
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Learning Objectives:
1. To understand the structure, function and characteristics of computer systems.
2. To understand the design of the various functional units and components of computers.
3. To identify the elements of modern instructions sets and their impact on processor design.
4. To explain the function of each element of a memory hierarchy
5. To identify and compare different methods for computer I/O.

Learning Outcomes: At the end of this course student will be able to

1. Demonstrate computer architecture concepts related to design of modern processors,memories and I/Os.
2. Analyze the performance of commercially available computers.
3. develop logic for assembly language programming

Unit 1   **16hrs**

1.1 **Basic Structures of Computers:** Computer types, Functional Units-Input unit, Memory unit, Arithmetic and logic unit, Output unit, Control unit, Basic operational concepts, Bus structures, Microprocessor and Multicomputer

1.2 **Storage Representation:** Storage representation of characters, Memory locations and addresses-Byte addressability, Memory operation.

Unit 2   **16hrs**

2.1 **Addressing modes:** Direct, Indirect, Immediate, Relative, Indexed. Instruction Formats: Zero address,One address, One-and-half address, Two address, Three address.

2.2 **Instruction types:** Data transfer, Arithmetic, Branching, Logical, Rotate, Stack operations, Input/output and Machine control instructions

Unit 3   **16hrs**

3.1 Input / Output Organization: Accessing Input/ Output devices, Interrupts, Direct Memory Access(DMA), Buses- Synchronous bus, Interface circuits- Parallel port, Serial port

3.2 Memory System: Basic concept, Random Access Memories-Static RAM, Asynchronous DRAMs, Synchronous DRAMs, Read Only Memories-PROM,EPROM,EEPROM, Flash memory, Cache Memory, Virtual memories,

3.3 Secondary storage-Magnetic hard disks, Optical disksArithmetic : Addition and Subtraction of Signed numbers

---

Text Books:

1. Carl Hamacher, Z. Varnesic & S. Zaky, Computer Organization, 5th Edition, McGraw Hill, 2002.

Reference Books:

Logic and Computer Design Fundamentals, M.Moris Mann & Charles R. Kime, 2nd Edition, 2001, Pearson Education Asia.

BCA SEMESTER-II

TITLE: Operating SystemsLAB(2BCA6)
Soft Core
Class Duration : 16 Weeks with 6 Hours a week = 96 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 20 = 100

a. Dos Commands - Internal - DIR, MD, CD, RD, COPY, DEL, REN, VOL, DATE,

b. TIME, CLS, PATH, TYPE.

External- CHKDSK, XCOPY, PRINT, DISKCOPY, DISCOMP, DOSKEY,   TREE, MOVE, LABEL, APPEND, FORMAT, SORT,FDISK, BACKUP, EDIT, MODE, ATTRIB HELP, SYS.

b. Basics of WINDOWSusing start menu, desktop, taskbar, wordpad, notepad

c.File management- creation, copy, delete, moving of files in directories

d.Getting Started- LINUX commands

e.Introduction to Shell Concept and Shell Programming
    1. Shell script to demonstrate simple printing using echo
    2. Shell script to print user information
    3. Shell script to print the given details to obtain the following information
a. List of files and directories
b. Count lines , words and characters
c. List of currently logged in users
d. User information
e. Login date
f. Present working directory
g. Version
h. List of process
i. User home directory
    4. Shell script to read the name from the keyboard.
    5. Shell script to demonstrate the swapping of two numbers
    6. Shell script to demonstrate the sum and average of 3 numbers
    7. Shell script to demonstrate the area of rectangle
    8. Shell script to check whether the number is positive or negative
    9. Shell script to read marks and display the grade
    10. Shell script to rename, delete and copy a file
    11. Shell script multi way selection using switch case
    12. Shell script to simulate a simple calculator
    13. Shell script to sort the files, I/P files using command line arguments
    14. Shell script to display of chess board
    15. Shell script to find a factorial of given numbers
    16. Shell script to display Fibonacci series

BCA SEMESTER-III
TITLE: Software Engineering
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Course Objectives
1. To provide students an in depth understanding of software engineering principles.
2. To prepare the students to develop the skills necessary to handle software projects.
3. To make the students aware of the importance of software engineering principles in designing software projects.

Learning Outcome
1. Understand the importance of the stages in the software life cycle.
2. Understand the various process models.
3. Understand the UML notation.
4. Be able to design software by applying the software engineering principles.

Unit 1	**Overview**: System modeling, The system engineering process, System	**21 hrs**
1.1	Procurement;Software process models, Software specification, Software design and implementation, Software validation, Software evolution.	
1.2	**Requirement Engineering**: Functional and Non-functional requirements, User requirements, System requirements, the software requirements document; Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.	
1.3	**System Models:** Context models, Behavioral models, Data models, Object models; Prototyping in software process, User interface prototyping.	

Unit 2		**20 hrs**
2.1	**Software Design**: Architectural design - System structuring, Control models, Modular decomposition;	
2.2	Object Oriented design – Objects and object classes, An object oriented design process;	
2.3	User interface design– Principles, User interaction, Information presentation, User support.	
2.4	**Verification and Validation**: Planning, Software inspections, Automated static analysis, Clean room software development; Software testing – Defect testing, Integration testing, Object oriented testing.	

Unit 3		**07 hrs**
3.1	**Software Management:** Project management – Activities, Planning, Scheduling, Risk management; Software cost estimation – Productivity,	
3.2	Estimation techniques, Project duration and staffing; Quality management – Assurance and standards,	
3.3	Planning, Quality control, Software measurements and metrics.	

Text Books:

1. Software Engineering, Ian Sommerville, 6th Edition, Pearson Education Ltd., 2001.

Reference Books:
1. Software Engineering – A practitioners approach, Roger. S. Pressman, Tata-McGraw Hill 4th Edition.

An Integrated Approach to Software Engineering, PankajJalote, Narosa Publications.

TITLE: Database Management System
Hard Core
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Course Objectives
- To provide strong foundation of database concepts and develop skills for the design and implementation of a database
- Application with a brief exposure to advanced database concepts.

Learning Outcome
- Understanding the core terms, concepts, and tools of relational database management systems.
- Understanding database design and logic development for database programming.

Unit 1   **12 hrs**

1.1	**Introduction to Database System Concepts and Architecture.** Databases and
1.1.1	Database Users: Introduction, an example, Characteristics of the Database
1.1.2	Approach, Users, Advantages of Using a DBMS Approach, when not to use a
1.1.3	DBMS.
1.2	Database System concepts and architecture : Data Models, Schemas, and Instances, Three-schema architecture and Data Independence, Database
1.3	Languages and Interfaces, The Database System Environment, Classification of
1.4	Database Management Systems. Data Modeling Using the Entity-Relationship
1.5	Model : High-Level Conceptual Data Models for Database Design, An example database application, Entity Types, Entity Sets, Attributes and Keys,
1.5.1	Relationships, Relationship Types, sets, roles, and Structural Constraints, Weak
1.5.2	Entity Types, ER Diagrams, Naming Conventions, and Design Issues.

12 hrs

Unit 2	**Relational Data Model**, Relational Constraints, and Relational Algebra:
2.1	Relational Model Concepts, Relational model Constraints and Relational
2.1.1	Database Schemas, Update Operations, transactions and Dealing with
2.1.2	Constraint Violations Relational Algebra and Relational Calculus: Unary
2.1.3	relational algebra Operations : SELECT and PROJECT, Relational Algebra
2.2	operations from Set theory,
2.3	Binary relational operations - JOIN and DIVISION, Additional Relational Operations, Examples of Queries in Relational Algebra.
2.4	Functional dependencies and Normalization for Relational databases: Functional dependencies, Normal Forms based on primary keys, General
2.4.1	definitions of second and third normal forms, Boyce-Codd Normal form.
2.5	Disk Storage, basic file structures and Hashing: Secondary storage devices, Buffering of Blocks, Placing File Records on Disk, Operations on Files, Files of Unordered Records (Heap Files), Files of Ordered Records (Sorted Files), Hashing Techniques. Other primary file organizations, parallelizing disk access using RAID technology, New storage systems

Unit 3   **12 hrs**

3.1   **SQL:** Introduction, data types and table definition-constraints, null primary key,

3.1.1   Unique, check and Referential Integrity, SQL function, SET operator (Union,

3.1.2   Union all, Intersect, Difference), SQL Operator (Arithmetic, Comparison,
          Logical operator).

3.2   DDL – Create, Alter, Truncate, View and Drop command .

3.3   DML - Insert, Select with different clauses (Simple, Nested Queries), Update
          and Delete Command.

3.4   DCL – Grant privilege command, Revoke privilege command.

3.5   Transaction control Language- commit, save point, Rollback command

Unit 4   Database Triggers: Introduction, use of database triggers, types of triggers –   **12hrs**

4.1   row triggers, statement triggers, before triggers, after triggers, combination
          triggers, deleting a trigger.

4.2   **PL/SQL:** Introduction, Advantages of PL/SQL, The generic PL/SQL block, The
          character set, literals, data types, variables, constants, LOB types, Logical
          comparisons, control structure – conditional control, iterative control, sequential
          control.

4.3   **PL/SQLSecurity** – Types of locks, levels of locks, Explicit locking

          <u>**Text Book:**</u>
          1. SQL, PL/SQL The programming language of oracle– Ivan Bayross, 4th edition
          2. SQL : Ivan Bayross

          <u>**Reference Books:**</u>
          1. Database system concepts by Korth, Sudarshan, Silberchatz, 4th edition.
          2. Database system: Navathe
          3. Database Management Systems : Alexis Leon & Mathews Leon

                                              *****

BCA SEMESTER-III
TITLE: CPU Architecture and Microprocessor
Hard Core
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Course Objectives

To provide students with a fundamental understanding of the functional components of a computer system, and how they are organised. The emphasis of the module is on the hardware aspects of a system, and how hardware is used during the execution of software. This is a core component of all computer science related degree courses. Practical skills will also be developed in the use and construction of computer components, and their interfacing to microprocessors.

Learning Outcomes

By the end of the module a student should be able to:
- Understand the operation of electronic logic elements
- Understand the organisation of a computer system in terms of its main components
- Understand the detailed operation of a simple microprocessor
- Understand different processor architectures
- Understand input/output mechanisms
- Understand the various parts of a system memory hierarchy
- Have practical experience of prototyping digital circuits
- Be able to interface digital circuits to microprocessor systems

Unit 1   **16 hrs**

1.1   Introduction:

1.1.1   Simple model of microprocessor – Counter, Decoder A, Register Array, Common Bus, Register I, Decoder B, Control unit, Switch control circuit, ALU, Operation.

1.1.2   Different Phases in the execution process – Fetch, Decode, Execute.

1.2   **Storage Representation:** Storage representation of characters, Memory locations and addresses-Byte addressability, Memory operation.

1.3

1.3.1   **Addressing modes:** Direct, Indirect, Immediate, Relative, Indexed. Instruction Formats: Zero address,One address, One-and-half address, Two

1.4   address, Three address.
        Instruction types: Data transfer, Arithmetic, Branching, Logical, Rotate, Stack operations, Input/output and Machine control instructions.

Unit 2   **16 hrs**

2.1   **The 8085 Microprocessor:**

2.1.1 Features and Architecture of 8085 – Registers, Arithmetic Logic Unit, Instruction Decoder, Address Buffer, Data Buffer, Increment/decrement address latch, Interrupt control, Serial I/O control, Timing and Control circuitry.

2.1.2 Pin Definitions of 8085 – Power supply and frequency signals, Data bus and address bus, Control and status signals, Interrupt signals, Serial I/O signals, DMA Signal, Reset signals.

2.2   **8085 Instruction Set and Programming:**

2.2.1   a. Instruction formats, Opcode formats, Addressing modes.

2.2.2   b. 8085 Instruction Set – Data transfer group, Arithmetic group,

2.2.2.2 Branch group, Logic group, Stack operations, Input/output and

2.2.2.3 machine control group.

2.2.2.4 Passing parameters, Subroutine.

2.3   **Instruction Timing Diagrams:** Instruction cycle, Machine cycle and T-state (Introduction Only).

Unit 3   **16 hrs**

3.1   **8085 Interfacing:** I/O Interfacing – I/O mapped I/O, I/O mapped selection, Memory mapped I/O.   I/O   transfer   techniques (Introduction only).

3.2   **8085 Interrupts:** Maskable and non-maskable interrupts. Hardware and Software interrupts.
Introduction to 8086, advantages over 8085, additional features of 8086, modified addressing schemes.

Text Books:

1. Computer Organization, Carl Hamacher, Z. Varnesic& S. Zaky, 5th Edition, McGraw Hill, 2002.

2. Microprocessor Architecture, Programming and Application with 8085 Ramesh S. Gaonkar — Penram International Publishing (India).

Reference Books:

1.   The Intel Mircroprocessor Systems: The 8086 / 8088 family architecture, programming and designing Barry B Brey — PHI Publication.

2.   Mircroprocessor 8085 and Peripherals by A.P. Godse, Technical Publication.

3.   Micro Computers and Microprocessor, John Uffenbeck,PHI.

4.   Digital logic and Computer design, Morris Mono –PHI Pvt. Ltd., New Delhi.

BCA SEMESTER-III
TITLE: Microprocessors lab
Hard Core
Class Duration : 16 Weeks with 6 Hours a week = 96Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Exercises should be based on 3BCA6.
PART A
1. Program to copy the content of two register into different memory location.
2. Subtraction of 2 8-bit numbers
3. Swapping of 2 8-bit data using direct and indirect mode.
4. Addition of 2 8-bit numbers with carry
5. Multiplication of 2 8- bit numbers
6. Division of 2 8-bit numbers.
7. Program to find the largest of two 8-bit numbers.
8. Program to check whether given number is even or odd,if it is even display FF else display 00
9. Program to find the 1's and 2's complement of given 8-bit number.
10. Program to exchange the content of two register pairs, using XCHG and store these numbers
11. into different memory location.
12. Program to find the sum of N natural numbers.
13. Progarm to generate the series of all numbers up to N.

PART B
1. Progaram to transfer the set of data from one set of memory location to another set of memory location.
2. Program to generate Fibonacci series up to N
3. Addition of two 16-bit numbers
4. Subtraction of two 16- bit numbers.
5. Program to convert hexa decimal to BCD.
6. Program to find the largest of N numbers.
7. To sort the numbers in ascending order.
8. To search an element in a list
9. To sort numbers in descending order
10. To find the square of given number.
11. To find the number of 1's and 0's in a given 8-bit date
12. To find the sum of N numbers.
13. To count numbers from 0 to 99 with delay

Activity 1:
Database : Student (DDL, DML statements)
Table: Student

Name	Regno	Class	Major
Smith	17	1	CS
Brown	8	2	CS

Table: Course

CourseName	CourseNumber	CreditHours	Department
Intro to computer science	CS1310	4	CS
Data Structure	CS3320	4	CS
Discrete Mathematics	MATH2410	3	MATH
Database	CS3380	3	CS

Table: Section

SectionIndentifier	CourseNumber	Year	Instructor
85	MATH2410	98	King
92	CS1310	98	Andreson
102	CS3320	99	Knuth
112	MATH2410	99	Chang
119	CS1310	99	Andreson
135	CS3380	99	Stone

Table: Grade_report

Regno	Section_identifier	Grade
17	112	B
17	119	C
8	85	A
8	92	A
8	102	B
8	135	A

☐Create Tables using create statement
☐Insert rows to individual tables using insert statement

Alter table section add new field section and update the records
 Delete brown's grade report
 Drop the table section

Activity 2: (Select clause, Arithmetic Operators)
Database: employee
Create Following tables and insert tuples with suitable constraints
EMPLOYEE

EMPID	FIRSTANAME	LASTNAME	Hire Date	ADDRESS	CITY
1001	George	Smith	11-May-06	83 first street	Paris
1002	Mary	Jones	25-Feb-08	842 Vine Ave	Losantiville
1012	Sam	Tones	12-Sep-05	33 Elm St.	Paris
1015	Peter	Thompson	19-Dec-06	11 Red Road	Paris
1016	Sarath	Sharma	22-Aug-07	440 MG Road	New Delhi
1020	Monika	Gupta	07-Jun-08	9 Bandra	Mumbai

EMPSALARY

EMPID	SALARY	BENEFITS	DESIGNATION
1001	10000	3000	Manager
1002	8000	1200	Salesman
1012	20000	5000	Director
1015	6500	1300	Clerk
1016	6000	1000	Clerk
1020	8000	1200	Salesman

Write queries for the following
1. To display FIRSTNAME, LASTNAME, ADDRESS AND CITY of all employees living in PARIS.
2. To display the content of employee table in descending order of FIRSTNAME
3. Select FIRSTNAME and SALARY of salesman
4. To display the FIRSTNAME,LASTNAME, AND TOTAL SALARY of all employees from the table EMPLOYEE and EMPSALARY. Where TOTAL SALARY is calculated as SALARY+BENEFITS
5. List the Names of employees, who are more than 1 year old in the organization
6. Count number of distinct DESINGATION from EMPSALARY
7. List the employees whose names have exactly 6 characters
8. Add new column PHONE_NO to EMPLOYEE and update the records
9. List employee names, who have joined before 15-Jun-08 and after 16-Jun-07
10. Generate Salary slip with Name, Salary, Benefits, HRA-50%, DA-30%, PF-12%, Calculate gross.
Order the result in descending order of the gross.

Activity 3: (Logical, Relational Operators)
Database: Library
Create Following **tables** and insert **tuples** with suitable constraints
Table: Books

Book_Id	Book_name	Author_Name	Publishers	Price	Type	Quantity
C0001	The Klone and I	Lata Kappor	EPP	355	Novel	5
F0001	The Tears	William Hopkins	First Publ	650	Fiction	20
T0001	My First C++	Brain & Brooke	ERP	350	Text	10
T0002	C++ Brainworks	A.W.Rossaine	TDH	350	Text	15
F0002	Thunderbolts	Ana Roberts	First Publ.	750	Fiction	50

Table : Issued

Book_Id	Quantity_Issued
T0001	4
C0001	5
F0001	2
T0002	5
F0002	8

Write queries for the following

1. To show Book name, Author name and price of books of **First Publ**. publisher
2. Display Book id, Book name and publisher of books having quantity more than 8 and price less than 500
3. Select Book id, book name, author name of books which is published by other than ERP publishers and price between 300 to 700
4. Generate a Bill with Book_id, Book_name, Publisher, Price, Quantity, 4% of VAT "Total"
5. Display book details with book id's C0001, F0001, T0002, F0002 (Hint: use IN operator)
6. Display Book list other than, type Novel and Fiction
7. Display book details with author name starts with letter 'A'
8. Display book details with author name starts with letter 'T' and ends with 'S'
9. Select BookId, BookName, Author Name , Quantity Issued where Books.BooksId = Issued.BookId
10. List the book_name, Author_name, Price. In ascending order of Book_name and then on descending order of price

Activity 4: (Date Functions)
Database : Lab

No	ItemName	Costperitem	Quantity	Dateofpurchase	Warranty	Operational
1	Computer	30000	9	21/5/07	2	7
2	Printer	5000	3	21/5/06	4	2
3	Scanner	8000	1	29/8/08	3	1
4	Camera	7000	2	13/6/05	1	2
5	UPS	15000	5	21/5/08	1	4
6	Hub	8000	1	31/10/08	2	1
7	Plotter	25000	2	11/1/09	2	2

Create Following **table** and insert **tuples** with suitable constraints (Use date functions and aggregate functions)

1. To select the ItemName purchase after 31/10/07
2. Extend the warrenty of each item by 6 months
3. Display Itemname , Dateof purchase and number of months between purchase date and present date
4. To list the ItemName in ascending order of the date of purchase where quantity is more than 3.
5. To count the number, average of costperitem of items purchased before 1/1/08
6. To display the minimum warranty , maximum warrenty period
7. To Display the day of the date , month , year of purchase in characters
8. To round of the warranty period to month and year format.
9. To display the next Sunday from the date '07-JUN-96'

10. To list the ItemNaName, which are within the warranty period till present date

Activity 5: (Numeric, character functions)

Use Functions for the following

1. Find the mod of 165,16
2. Find Square Root of 5000
3. Truncate the value 128.3285 to 2 and -1 decimal places
4. Round the value 92.7683 to 2 and -1 decimal places
5. Convert the string 'Department' to uppercase and lowercase
6. Display your address convert the first character of each word to uppercase and rest are in lowercase
7. Combine your first name and last name under the title Full name
8. A) Take a string length maximum of 15 display your name to the left. The remaining space should be filled with '*'
9. Take a string length maximum of 20 display your name to the right. The remaining space should be filled with '#'
10. Find the length of the string 'JSS College, Mysore'
11. Display substring 'BASE' from 'DATABASE'
12. Display the position of the first occurrence of character 'o' in Position and Length
13. Replace string Database with Datatype
14. Display the ASCII value of ' ' (Space)
15. Display the Character equivalent of 42

Activity : 6 (set operators)

Database : subject

Create Following **table** and insert **tuples** with suitable constraints

Table – Physics

Regno	Name	Year	Combination
AJ00325	Ashwin	First	PCM
AJ00225	Swaroop	Second	PMCs
AJ00385	Sarika	Third	PME
AJ00388	Hamsa	First	PMCs

Table – Computer Science

Regno	Name	Year	Combination
AJ00225	Swaroop	Second	PMCs
AJ00296	Tajas	Second	BCA
AJ00112	Geetha	First	BCA
AJ00388	Hamsa	First	PMCs

1. Select all students from physics and Computer Science
2. Select student common in physics and Computer Science
3. Display all student details those are studying in second year
4. Display student those who are studying both physics and computer science in second year
5. Display the students studying only physics
6. Display the students studying only Computer Science
7. select all student having PMCs combination
8. select all student having BCA combination
9. select all student studying in Third year
10. Rename table Computer Science to CS

Activity 7: (views)

Database: Railway Reservation System

Create Following **table** and insert **tuples** with suitable constraints

Table: Train Details

Train_no	Train_name	Start_place	Destination
RJD16	Rajdhani Express	Bangalore	Mumbai
UDE04	Udhyan Express	Chennai	Hyderabad
KKE55	Karnataka Express	Bangalore	Chennai
CSE3	Shivaji Express	Coimbatore	Bangalore
JNS8	Janashatabdi	Bangalore	Salem

Table : Availability

Train_no	Class	Start_Place	Destination	No_of_seats
RJD16	Sleeper Class	Banglore	Mumbai	15
UDE04	First Class	Chennai	Hyderabad	22
KKE55	First Class AC	Bangalore	Chennai	15
CSE3	Second Class	Coimbatore	Bangalore	8
JNS8	Sleeper Class	Bangalore	Salem	18

1. Create view **sleeper** to display train no, start place, destination which have sleeper class and perform the following
a. insert new record
b. update destination='Manglore' where train no='RJD16'
c. delete a record which have train no='KKE55'
2. Create view **details** to display train no, train name, class
3. Create view **total_seats** to display train number, start place, use count function to no of seats , group by start place and perform the following
a. insert new record
b. update start place='Hubli' where train no='JNS8'
c. delete last row of the view
4. Rename view sleeper to class
5. Delete view details

Activity 8 (group by, having clause)
Database: Bank system
Create Following **table** and insert **tuples** with suitable constraints
Table: Account

Account_no	Cust_Name	Brach_ID
AE0012856	Reena	SB002
AE1185698	Akhil	SB001
AE1203996	Daniel	SB004
AE1225889	Roy	SB002
AE8532166	Sowparnika	SB003
AE8552266	Anil	SB003
AE1003996	Saathwik	SB004
AE1100996	Swarna	SB002

Table: Branch

Branch_ID	Branch_Name	Branch_City
SB001	Malleshwaram	Bangalore
SB002	MG Road	Bangalroe
SB003	MG Road	Mysore
SB004	Jainagar	Mysore

Table: Depositor

Account_no	Branch_Id	Balance
AE0012856	SB002	12000
AE1203996	SB004	58900
AE8532166	SB003	40000
AE1225889	SB002	150000

Table: Loan

Account_no	Branch_Id	Balance
AE1185698	SB001	102000
AE8552266	SB003	40000
AE1003996	SB004	15000
AE1100996	SB002	100000

1. Display Total Number of accounts present in each branch
2. Display Total Loan amount in each branch
3. Display Total deposited amount in each branch by descending order
4. Display max , min loan amount present in each city.
5. Display average amount deposited in each branch , each city
6. Display maximum of loan amount in each branch where balance is more than 25000
7. Display Total Number of accounts present in each city
8. Display all customer details in ascending order of brachid
9. Update Balance to 26000 where accno=AE1003996
10. Display Customer Names with there branch Name

Activity 9: (Nested Query)
Database : Book Dealer Table : Author

Author id	A Name	City	Country
EE10258	Sudaker Samuel	Bangalore	India
PE96358	Natarasu	Kolkata	India
LT45879	Tenenbaum	Toranto	Canada
PW56325	Sumitabha Das	Kolkata	India
KA56983	Galvin	Loss Angles	USA

Table : Publisher

Publisher_ID	Name	City	Country
21	TMH	Delhi	India
22	PHI	Kolkata	India
23	PEARSON	Mumbai	India
24	EEE	Singapore	Singapore
25	LPE	Banglore	India

Table : Category

Cateogry_ID	Description
31	CSE
32	ISE
33	E&E
34	E&C

Table : Catalog

Book_id	Title	Author_ID	Publisher_ID	Category_ID	Year	Price
41	OS	PW56325	23	31	1998	275
42	CN	LT45879	22	32	2000	475
43	EC	EE10258	23	34	2002	380
44	SE	LT45879	24	32	2002	480
45	DBMS	PW56325	21	31	1999	650
46	EC	PE96358	25	33	2004	250

Table : Order Details

Order_no	Book_id	Qunatity
51	41	15
52	45	50
53	42	20
54	44	10
55	43	35
56	46	25

1. List the other publications located where PEARSON publication is located
2. List the book with maximum price
3. Display book details having quantity=25

Author_idA_Name City Country
EE10258 Sudaker Samuel Bangalore India
PE96358 Natarasu Kolkata India
LT45879 TenenbaumToranto Canada
PW56325 Sumitabha Das Kolkata India
KA56983 Galvin Loss Angles USA 53

4. Display the author details those who are publishing with PHI publisher
5. Display the Books details published for 'CSE' category
6. Display the author details those who publish in Indian publications
7. Display book details those who have orders less than 20
8. Display all the books published under 'CSE' & 'ISE' category
9. Delete book details of order_no=56
10. Alter table order details add new column order_date& update the columns

Activity 10:
Database: Mobile Shoppe (Using Joins)
Create Following **table** and insert **tuples** with suitable constraints
Table: Mobile Handsets

Custno	Cname	Model	Handsetno	Amount
1010	Sita	Nokia	RM560	9500
1020	Ritesh	Samsung	SR12365	3200
1030	Reena	Nokia	RM236	1200
1040	Karan	Sony Ericsson	SE12334	8200
1050	Anu	LG	LT1255	2000

Table: Connection Details

Custno	Cname	Connection	ActivationDate	Validity	Amount	Phoneno
1010	Seetha	Airtel	11-May-09	365	650	9985632551
1020	Ritesh	Vodafone	10-Sep-08	180	400	9923033652
1030	Reena	Tata Docomo	12-Aug-09	100	150	9036225636
1040	Karan	Airtel	12-Jan-09	90	200	9896325415
1060	Anoop	Reliance	12-Sep-09	365	220	9342653326

1. Display Customer Name, Handset Model, connection, Validity of the connection
2. Display All Mobile Handsets along with Connection and Activation date
3. Display all Connection Details along with handset model and Handset purchase date
4. Display The Handset Details which is having highest amount than Samsung handset
5. Display Customer Name, Handset Model, connection, Validity which is having validity of one year
6. Display Customer number, customer name, connection and activation date of connections activated between 01-Jan-08 to 30-Dec-09
7. Display Customer number, Model, Connection which is having 'Airtel' Connection
8. Display Customer number, Model, Connection which is having model is Nokia and connection is Airtel
9. Select Customer number, customer name and model which is having price more than model Samsung
10. Perform Cartesian join on Mobile Handsets and Connection details table

11. PSQL PROGRAMS

BCA SEMESTER-IV
TITLE: Numerical Analysis and Statistics(4BCA3)
Hard Core
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Learning Objectives
1. Demonstrate knowledge ofthe standard statistical distributions.
2. Demonstrate knowledge of fixed-sample and large-sample statistical properties of point and interval estimators.

Learning outcome
1. Demonstrate the ability to perform complex data management and analysis.

2. Demonstrate knowledge of classical and repeated measures multivariate methods and computational techniques.

Unit 1	**Computer Arithmetic:** Floating point representation of numbers, arithmetic operations with normalization.	**20 hrs**
1.1		
1.2	Approximation and Errors – Significant figures, Accuracy and precision, Round off errors, Truncation errors.	
1.3	**Finding the roots of an equation:** Iterative method: Bisection method, Newton Raphson method, RegulaFalsi method, Secant Method.	
1.4	**Solving simultaneous linear equations**: Gauss Elimination method. Gauss Jordon method, and Gauss-Seidel iterative method.	
Unit 2		**14 hrs**
2.1	**Ordinary differential equations**: Taylor series, Euler method, Range Kutta II and IV order methods.	
2.2	**Numerical Integration:** Simpson's 1/3 and 3/8 rule, Trapezoidal rule.	
2.3	**Interpolation:** Difference Table, Newton's Forward and Backward interpolation.	
Unit 3		**16 hrs**
3.1	**Descriptive Statistics**: Need for quantifying data. Quantitative and qualitative data. Frequency distributions – discrete and continuous, Histogram, frequency curve, cumulative frequency curve.	
3.2 2.3	**Measures of central tendency:** Mean, median and mode. Measures of dispersion – quartile deviation, standard deviation, coefficient of variation (Partition values – quartiles, deciles and percentiles).	
2.4	**Correlation and Regression:** Definition, explanation of concepts, problems	

Text Books:
1. Numerical Methods by Jain M.K., S.R.K. Iyengar and R.K. Jain.
2. Computer Oriented Numerical Methods by Rajaraman. V.
3. Fundamentals of Mathematical Statistics by Gupta and Kapoor (Sultan Chand).

Reference Books:
1. Numerical Methods by S.S. Sastry.
2. Probability and Statistics for engineers and scientists by Ronald E. Walpole and Raymond H Mayers.
3. Mathematical Statistics by John Freund (Prentice Hall India Pvt. Ltd.)

*****

BCA SEMESTER-IV
TITLE: Numerical Analysis and Statistics LAB (4BCA3)
Hard Core
Class Duration : 16 Weeks with 6 Hours a week = 96Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 20 = 100

1. Program to find the Mean of Individual series
2. Program to find the Mean of discrete series
3. Program to find the Mean of group data
4. Program to find the Median of Individual
5. Program to find the Median of discrete
6. Program to find the Median of group data
7. Program to find the Mode of discrete series using mean and median
8. Program to find the range and co-efficient range for the given values
9. Program to find the Inter quartile range for group data
10. Program to calculate the Standard Deviation in individual series
11. Program to calculate the Standard Deviation in discrete series
12. Program to calculate the Standard Deviation in group data
13. Co-relation
14. Regression
15. Program to find the roots of equation using Bisection method
16. Program to Evaluation of a Polynomial
17. Program to find the roots of equation using Newton-Raphson method
18. Program to find the roots of equation using Secant Method
19. Program to find the roots of equation using Regular Falsi Method
20. Program to solve the simultaneous equation using Gauss elimination Method
21. Program to solve the simultaneous equation using Gauss seidel Method
22. Program to find the solution using Euler's Method
23. Program to find the solution of Differential equation using RangueKutta IV/II order Method
24. Program to find the solution of the differential equations using Simpson's 1/3 order Method
25. Program to find the solution of the differential equation using Trapezoidal Method.

TITLE: Computer Networking
Hard Core
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Learning Objectives
1. To understand the fundamental concepts of computer networking and provide the knowledge of different protocols at different layers of models.

2. To understand the techniques used to share network bandwidth among the multiple users and provide the depth knowledge of DLL fundamentals

3. Learn how the data is transferred between the computers over the network.

Learning Outcome:
1. Master the terminology and concepts of the OSI reference model and the TCP/IP reference model;

2. Master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks;

3. Demonstrate knowledge of wireless networking concepts;

4. Appreciate contemporary issues in networking technologies and;Demonstrate knowledge of network tools.

Unit 1	Data Communication, Component and Basic Concepts –	**15 hrs**
1.1	Introduction, (3).	
1.1.1	Characteristics – Delivery, Accuracy, Timeliness and Jitter (4).	
1.1.2	Components – Message, Sender, Receiver, Transmission medium and protocol (4-5).	
1.2	Types of Connection/Line Configuration – Point-to-point and Multipoint (8).	
1.3	Topology – Mesh, Star, Tree, Bus, Ring and Hybrid Topologies(8-13).	
1.4	Transmission modes – Simplex, Half Duplex, Full Duplex (6-7).	
1.5	Categories of networks – LAN, MAN, WAN and Intranet (13-16).	
1.5	Layered Task: OSI Model:Layers in OSI Model Peer-to-Peer Protocol TCP/IP Protocol Suite:- FTP,Telnet. IP Utilities:ipconfig,netstat,ping Addressing: Physical,Logical,Port,Specific	

Unit 2   **15 hrs**

  2.1 Data & Signals: Bandwidth,bit rate Digital Representation of Information
           Maximum data rate For Noisy Channel- Shannon
           For Noiseless Channel- Nyquist
  2.2   Digital Transmission Mode Parallel Transmission Serial Transmission
  2.3   Multiplexing – An Introduction Types of Multiplexing – Frequency-
           division multiplexing,Time-division multiplexing Wavelength division
           multiplexing
  2.4   Transmission Media – An Introduction (191) Guided Media – Twisted pair
           cable – Unshielded and shielded twisted pair cable, Co-axial cable, Optical
           fiber cable – Structure and propagation.
  2.5   Random access:- Pure ALOHA,Slotted ALOHA
  2.6   Error Detection – (Data Communication & Networking-Forouzan 3rd
           Edition)
  2.7   Types of Error Detection -Vertical Redundancy Check
           Longitudinal Redundancy Check Cyclic Redundancy Check
           Checksum Error Correction.

Unit 3   **10 hrs**

  3.1 Local Area Network-LAN Structure
  3.2   LAN Bridges- Transparent Bridges,Source-Routing Bridges,Mixed Media
           Bridges
  3.3   Packet Switching Networks- Network Services & Internal network
           Operations
  3.4   Packet Network Topology Datagram & Virtual Circuits Connectionless
  3.5   Packet Switching Virtual-Circuit Packet Switching Structure of a Packet
           Switch   Routing in Packet Networks Routing Algorithm
           Classification Routing Tables
  3.6   Shortest Path Routing Flooding Congestion Control Algorithm

Unit 4   **08 hrs**

  4.1   Wireless LAN IEEE 802.11- Architecture Blue tooth – Architecture
           Wireless WAN
  4.2   Cellular Network   Frequency reuse principle, Transmitting, Receiving,
           Roaming, First Generation
  4.3   Satellite Network   Orbit, Foot print, categories of sattelite – GEO,
           MEO, LEO Network Layer:Internet Protocol
  4.4   IPV4- datagram,FragementationIPV6-Format
  4.5   Transport Layer Transport Layer Services
  4.5.1   TCP - TCP Services-Well Known Ports for TCP , Segment Format
  4.6   UDP -Well Known Ports for UDP,UserDatagram,Use of UDP Application
           Layer
  4.7   DNS

  Text Books:
       1. Data Communication & Networking-Behrouz A Forouzan(UNIT-
          1,2,4)
       2. Fundamental Concepts & key architecture-Albert Leon-Garcia
          &IndraWidjaja(Unit-3)
       3. Comuter Networks- Andrew Tanenbaum(UNIT3)

TITLE: OOPs with C#
Hard Core
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30= 100

Learning Objectives

1. programming in C # programming language,
2. knowledge of object-oriented paradigm in the C # programming language,
3. knowledge of .NET environments.

Learning outcomes

1. Knowledge of the structure and model of the programming language C #
2. Use the programming language C # for various programming technologies
3. Develop software in C # (application)
4. Evaluate user requirements for software functionality required to decide whether the programming language C # can meet user requirements (analysis)
5. Propose the use of certain technologies by implementing them in the C # programming language to solve the given problem (synthesis)
6. Choose an engineering approach to solving problems, starting from the acquired knowledge of programming and knowledge of operating systems. (evaluation)

Unit 1	**Over view of C#**	
1.1	Introduction to C#, Understanding C# environment, Overview of C#,	
1.2	Literals, variables, and Data types, operators and expressions,	
1.3	Decision making and branching,	
1.4	Decision making and looping,	**16 hrs**
1.5	Methods in C#,	
1.6	Handling Arrays, Manipulating Strings,	
1.7	Structures and Enumerations,	
1.8	Classes and Objects	
Unit 2	**Inheritance and threading**	**16 hrs**
2 .1	Constructor, destructor	
2.2	Inheritance and polymorphism, interface: multiple inheritance.	
2.3	Managing errors and exceptions,	
2.4	multithreading in C#	
2.5	Managing Console I/O Operation,	
2.6	**Memory management and pointers:**	
2.7	Memory management under the Hood, value data types,	
2.8	reference data types, garbage collection, freeing unmanaged resources (Refer Wrox programmer to programmer page no. 329-335)	

Unit 3   Windows forms and ADO.net   16 hrs
3.1 **Windows Forms:** Control class,
3.2 Standard controls and components (check box, radio button, comboBox, ListBox,
3.3 Checked List Box, Label, Listview, picture box, textbox, rich text box, panel, .
3.4 flow layout panel and table lay out panel, tool strip, menu strip(Refer Wrox programmer to programmer only the mentioned standard controls))
3.5 **ADO.Net overview,** Using database connection, commands (Refer Wrox programmer to programmer page no. 846-860)
3.6 **Fast Data Access:** Data Reader, Data Set class (Refer Wrox programmer to programmer page no. 863-870)

   Text Books:
   1.Programmer in C# A Primer by Balagurusamy E.
   2.Wrox Programmer to Programmer Professional C# 2008

                                   *****

                   BCA SEMESTER-IV
              TITLE: OOPs with C#**LAB**
                   Hard Core
   Class Duration : 16 Weeks with 6Hours a week = 96Hrs
   MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Program list is based on OOPs with C#Theory Syllabus

PART A:
1. application using class and objects
2. Console application to perform Stack operation.
3. Console application to reverse the number and to find palindrome or not.
4. Console application to find the product of two matrices.
5. Console application to display the marks of a student using struts
6. Console application to perform string handling functions.
7. Console application to create user defined exception
8. Console Application to perform operator overloading
9. Console application to achieve multiple inheritances using interface.
10. Console application to assign the priority to a thread.

PART B:
1. Design a calculator using windows application
2. Design a window application to calculate the NET SALARY of an Employee
3. Design a window application using check box and option button

4. Design a window application using list box and combo box
5. Design a window application using picture box.
6. Design a window application to change the size of the font using menu strip and tool strip
7. Design a window application to use a frame control to navigate to web pages
8. design a window application to Display Content in a Multitabbed User Interface
9. Design a window application to insert, delete, update and search operation of a student information
10. Design a window application to bind data to combo box

****

BCA SEMESTER-V
TITLE: Java and Advanced Java
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT30 = 100

Learning Objectives
1. programming in the Java programming language,
2. knowledge of object-oriented paradigm in the Java programming language,
3. the use of Java in a variety of technologies and on different platforms.

Learning outcomes
1. knowledge of the structure and model of the Java programming language, (knowledge)
2. use the Java programming language for various programming technologies (understanding)
3. develop software in the Java programming language, (application)
4. evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements (analysis)
5. propose the use of certain technologies by implementing them in the Java programming language to solve the given problem (synthesis)
6. choose an engineering approach to solving problems, starting from the acquired knowledge of programming and knowledge of operating systems. (evaluation)

Unit 1   **14 hrs**

Introduction to Java: Java and Java applications; Java Development Kit(JDK); Java is interpreted, Byte Code, JVM; Object-oriented programming; Simple Java programs.

Data types and other tokens: Boolean variables, int, long, char, operators,arrays, white spaces, literals, assigning values; Creating and destroying objects; Access specifiers.

Operators and Expressions: Arithmetic Operators, Bitwise operators,Relational operators, The Assignment Operator, The ? Operator; Operator

Precedence; Logical expression; Type casting; Strings

Control Statements: Selection statements, iteration statements, Jump Statements. Command Line Arguments

Classes, Inheritance, Exceptions, Applets : Classes: Classes in Java; Declaring a class; Class name; Super classes; Constructors; Creating instances of class.

Unit 2 **Inheritance:** Simple, multiple, and multilevel inheritance; Overriding, overloading. **16hrs**
Exception handling in Java:
The Applet Class: Two types of Applets; Applet basics; Applet Architecture; An Applet skeleton; Simple Applet display methods; The HTML APPLET tag; Passing parameters to Applets.
Multithreaded Programming: What are threads? Life Cycle of a Thread.

Unit 3 **Event Handling:** The delegation event model; Event classes; Sources of events; **22 hrs**
Event listener interfaces; Adapter classes; Inner classes.
Overview of J2EE and J2SE and Database Acess:
The Concept of JDBC; JDBC Driver Types;
A Brief Overview of the JDBC process; Database Connection
Java Data base connectivity – 2 tier, 3 tier architecture

Text Books:
1. Complete Reference Java By Patrick Norton
2. Java 2 Complete – BPB Publications.
3. Java Workshop – Steven Holzner
4. Advanced Java -- Unleashed

*****

BCA SEMESTER-V
Title: Java Lab(5BCA7)
Class Duration : 16 Weeks with 6Hours a week =96 Hours
MARKS THEORY 70 + INTERNAL ASSESSMENT30 = 100

PART A
1. Write a Java program to demonstrate **Printing in Java**
2. Write a Java Program to perform basic arithmetic operations .
3. Write a Java program to demonstrate Classes and objects
4. Write a Java program to demonstrate constructor -default
5. Write a Java program to demonstrate Function overloading.
6. Write a Java program to demonstrate constructor overloading.
7. Write a Java program to illustrate One dimentional array
8. Write a Java program to demonstrate two dimensional array
9. Write a Java program to get current date and time using calendar
10. Write a java program to generate random number using math class
11. Write a Java program to find quadric equation by accepting input from keyboard
12. Write a Java program to demonstrate Single Inheritance.
13. Write a Java program to demonstrate Multiple Inheritance.
14. Write a Java program to demonstrate Multilevel Inheritance.
15. Write a Java program to demonstrate Hybrid Inheritance.
16. Write a applet program for free hand drawing

17. Write a Java program to demonstrate **Printing in Java**
18. Write a Java Program to perform basic arithmetic operations .
19. Write a Java program to demonstrate Classes and objects
20. Write a Java program to demonstrate constructor -default
21. Write a Java program to demonstrate Function overloading.
22. Write a Java program to demonstrate constructor overloading.
23. Write a Java program to illustrate One dimentional array
24. Write a Java program to demonstrate two dimensional array
25. Write a Java program to demonstrate Servelets
26. Write a Java program to demonstrate RMI

PART B

1 Write a Applet program to Read line of characters from console using InputStream

2 Write a Java program to find ip address of your system.

3 Write a Java program to Illustrate threads.

4 Write a Applet program to Read line of characters from consoleusing InputStream

5 Write a java program to illustrate packages

6 Write a Java program to find ip addressof your system.

*****

BCA SEMESTER-V
TITLE: ASP.Net with C#
Hard Core
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30= 100

Learning Objectives

1. This course will cover the practical aspects of multi-tier application development using the .NET

2. framework.

3. The goal of this course is to introduce the students to the basics of distributed application development.

4. this will introduce the students to Web Service development and .NET remoting.

5. Technologies covered include the Common Language Runtime (CLR), .NET framework classes, C#, ASP.NET, and ADO.NET.

6. thise will also cover service oriented architecture, design, performance, security, content

managements systems and deployment issues encountered in building multi-tier distributed applications.

Learning outcomes

1. Students will able to design web applications using ASP.NET

2. Students will be able to use ASP.NET controls in web applications.

3. Students will able to debug and deploy ASP.NET web applications

4. Students will be able to create database driven ASP.NET web applications and web services

UNIT 1   **16 hrs**

Getting Started with ASP.Net: what is static web page, how are static web pages served, how are dynamic web pages served : Two ways of providing Dynamic Web Page content, An overview of the Technologies, What is ASP .NET, how does ASP.NET differ from ASP?(page no. 9-21)

Anatomy of an ASP.NET: What is .NET: From your code to Machine Code, Introducing Common, Intermediate language, Objects, Objects everywhere, The .Net base class How ASP.NET works (page no. 61-75), Forms and HTML Server Controls: Simple web Theory, HTML Forms, How the <form> tag works in ASP.NET(page no. 87-119), introducing XML: The format of XML, Examples of Markup Languages, creating an XML document, Beyond Data Display, Styling XML (page no. 151-178)

UNIT II   **Event-driven programming and post back:** What is an event?, What is event-driven programming, ASP.NET events, Events in html, server control events in ASP.Net, event-driven programming and post back, changing the way we program on the web (page no. 231-249), Objects in ASP.NET: Namespaces, The page class, ASP.NET core objects, State Handling (page no 326-369),   **16 hrs**

Reading from Data Sources: ADO.Net: Managed providers, ADO.Net objects, The connection object, The command object and data reader, the dataset and data table objects (page no. 407-428), Manipulating Data Sources (page no. 439-474)

UNIT III   **ASP.NET Server Controls:** Other   **16 hrs** types of Controls, ASP.Net server controls, page lifecycle (page no. 481-492), .NET Assemblies and custom controls: Three tier application design, ASP.Net Application Design, .NET assemblies, Custom Server Controls, (page no. 573-599),

Web services: What is a web service, Http, XML and web services, Building an ASP.Net web service, Consuming a web service, web service discovery (665-693)

Text Books:

Wrox Programmer to Programmer Professional C# 2008

Reference book:

ASP.Net using C# - Black Book

*****

BCA SEMESTER-V
TITLE: ASP.Net with C#
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Programs based on ASP.NET with C# theory syllabus

Part A:
1. Create a web application to find the sum of two numbers
2. Create a web application to book a trip using on click event
3. Create a web application to Bind data source to asp:RadioButtonList
4. Create a web application to design online shopping using validation controls
5. Create a web application Read data from xml and bind to asp:DataGrid
6. Create a web application to bind data to list box using data bind
7. Create a web application to upload a file
8. Develop a calendar application to display the events and to add new event

Part B:
1. Create a web application to develop phone book
2. Create a web application to access a component using assemblies
3. Create a web application to create student admission form
4. Create a web application using three tier architecture
5. Create a web application to retain information from one page to another using session
6. Create a web application using three tier architecture
7. Create a web service program to perform Arithmetic operations
8. Create a web service program to retrieve student information from database

*****

BCA SEMESTER-V
TITLE:Data Warehouse and Data Mining
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Learning Objectives:
1. This course focuses on the fundamentals of data warehousing and their associated problem areas.
2. Data pre-processing and preparation, outlier detection, data warehouse design, On-line analytical processing are the major areas of coverage of this course.
3. This course also deals with the fundamentals of data mining and algorithms associated with the same.

Learning Outcomes:
1. Describe the fundamental concepts, benefits and problem areas associated with data warehousing
2. Describe the various architectures and main components of a data warehouse.
3. Design a data warehouse, and be able to address issues that arise when implementing a data warehouse.
4. Compare and contrast OLAP and data mining as techniques for extracting knowledge from a data warehouse.

Unit 1   **15 hrs**

Introduction: What is Data Warehouse? A Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Data cube technology, Data Mining, Data mining functionalities, Data cleaning, Data integration and transformation, Data Reduction.

Data Mining Primitives, Languages, and System Architectures: Data Mining primitives, Presentation and Visualization of discovered patterns, Data Mining query language.

Unit 2   **15 hrs**

Mining Association Rules: Single-dimensional Boolean association rules from transactional databases.
Classification and Prediction: Issues regarding classification and prediction, Classification by Decision tree induction, Bayesian Classification, Classification by Back propagation, Prediction.

Unit 3   **18 hrs**

Cluster Analysis: What is a cluster analysis? Types of data in cluster analysis: A categorization of Major Clustering methods, Partitioning methods, Hierarchical methods; Model-Based Clustering Methods: Statistical approach.
Applications and Trends in Data Mining: Data Mining applications, Data Mining system products and research prototypes, Additional themes on Data Mining, Data Mining and Intelligent query answering. Trends in Data Mining.

Text Books:
1. 'Data Mining Concepts and Techniques',JiaweiMichelineKamber, MorganKauf Mann Publishers.

Reference Books:
1. 'Modern Data Warehousing, Mining and Visualization', George M. Marakas ,Pearson Education, 2003.
2. 'Building the Data Warehouse', W.H. Inmon ,Wiley dreamtech, 3rd Edition.
3. Mastering Data Mining – Michael J.A. Berry & Gordon S. Linoff (Wiley Pub.).
4. Data Warehousing (Pearson Ed.) – Sam Anahory& Dennis Murray.

BCA SEMESTER-V

TITLE:System Software
Elective I(5BCA51)
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Learning Objectives:

This course focuses on the fundamentals of data warehousing and their associated problem areas.

Data pre-processing and preparation, outlier detection, data warehouse design, On-line analytical processing are the major areas of coverage of this course.

This course also deals with the fundamentals of data mining and algorithms associated with the same.

Learning Outcomes:

Describe the fundamental concepts, benefits and problem areas associated with data warehousing

Describe the various architectures and main components of a data warehouse.

Design a data warehouse, and be able to address issues that arise when implementing a data warehouse.

Compare and contrast OLAP and data mining as techniques for extracting knowledge from a data warehouse.

Unit 1   **21hrs**

1.1   **Introduction:** What is system software? Components of system software, Evolution of system software.

1.2   **Machine Structure, Machine Language and Assembly Language:** General machine structure – memory, registers, Data instructions, Machine Languages, Assembly Languages

1.3   **Assembler:** General design procedure, design of assembler, statement of problem, data structures, format of database, Algorithm (2-pass assembler) in brief.

1.4   **Macro Language and the Macro Processor:** Macro instructions, features of macro facility – Macro instruction argument, Conditional macro expressions, Macro call with macros, Macro instruction defining macros single pass algorithm.

Unit 2   **14 hrs**

2.1   **Loader:**
Loader Schemes – (a).Compile and Go loader, (b).General loader scheme, (c).Absolute loader, (d).Sub routine linkers, (e).Relocating loader, (f).Direct linking loader, (g).Binder, linking loader, overlays, dynamic binder.
Design of an absolute loader.

2.2   Design of direct linking loader –
Specification of problem
Specification of data structure
Format of database
Algorithm.

Unit 3   **Compilers:**   **13 hrs**

3.1   Different phases,
3.1.1   Lexical phase – recognizing tokens, database used and algorithm.
3.1.2   Syntax and Interpretation phase – recognizing syntactic units and interpreting their
3.1.3   meaning, creating intermediate form – arithmetic, non-arithmetic and executable statement, database used and algorithm.
3.1.4   Code generation phase – databases used and algorithm.
3.1.5   Optimization phase – Machine independent and machine dependant optimizations with examples.
3.1.6   Assembly phase – databases used and algorithms.
3.1.7   General Model of compile – passes of compile with flow chart.

Text Books:
Introduction to System Software by D.M. Dhamdhere.

Reference Books:
System Programming by John Donovan

******

BCA SEMESTER-V
TITLE:Enterprise Resource Planning (5BCA53)
[Elective – I]
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Learning Objectives:
1. To provide a contemporary and forward-looking on the theory and practice ofEnterprise Resource Planning Technology.
2. To focus on a strong emphasis upon practice of theory in Applications and Practical-oriented approach.
3. To train the students to develop the basic understanding of how ERP enriches the business organizations in achieving a multidimensional growth.
4. To aim at preparing the students technological competitive and make them ready toself-upgrade with the higher technical skills.

Learning Outcomes:
1. Make basic use of Enterprise software, and its role in integrating business functions
2. Analyze the strategic options for ERP identification and adoption.
3. Design the ERP implementation strategies.
4. Create reengineered business processes for successful ERP implementation.

UNIT I		**14 hrs**
1.1	**ERP – Curtain Raiser:** An overview, Accommodating variety, Integrated Management Information, Seamless Integration, Supply Chain Management, Resource Management, Integrated data model, Scope, Technology, Benefits of ERP, Evolution, ERP revised, ERP & Modern Enterprise, problems.	
1.2	**Business Engineering & ERP:** An overview, What is Business Engineering (BE)? Significance of BE, Principles of BE, BRP, ERP & IT, ERP and Management concerns, problems.	
1.3	**Business Modeling for ERP:** An overview, Building the Business Model, problems.	
UNIT II		**16 hrs**
2.1	**ERP Implementation:** An overview, Role of consultants, vendors and users; Customization, Precautions, ERP: Post-implementation options, ERP implementation methodology, Guidelines for ERP implementation, problems.	
2.2	**ERP and the Competitive Advantage:** An overview, ERP & Competitive strategy, problems.	
2.3	**The ERP Domain:** An overview, MFG/PRO, OFS/Avalon – Industrial & Financial Systems, Baan IV, SAP, SAP R/3 Applications, Examples of as Indian ERP packages, The arrival of ERP III, problems.	
UNIT III		**16 hrs**
3.1	**Making of ERP:** An overview, Market Dynamics & Competitive Strategy, problems.	
3.2	**Case Studies:** An overview,	
3.2.1	Mercedes-Benz, KeeHin Industries, Bull Electronics Angers Plant Manufacturers, Ameritech, Essar Steel, Jindal Iron & Steel Company Ltd.,	
3.2.2	Indian Renewable Energy Development Agency (IREDA), ERP Handles Pressure, Sara ERP case study – Hawkins Cookers Ltd, A wholesome enterprise application,	
3.2.3	Sara IEMS (ERP III) case study – Pan Century, Oleo chemicals, Malaysia.	

Text Books:
1. Enterprise Resource Planning – Concepts & Practice (2nd Edition) by V.K. Garg& N.K. Venkitakrishna.
2. Enterprise Resource Planning by Alexis Leon.

Reference Books:ERP WARE – ERP Implementation Framework by V.K. Garg& N.K. Venkitakrishna.

BCA SEMESTER-V

TITLE: Operation Research [Elective – I] **(5BCA54)**
[Elective – I]
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY70 + INTERNAL ASSESSMENT 30 = 100

Learning outcomes
1. Identify and develop operational research models from the verbal description of the real system.
2. Understand the mathematical tools that are needed to solve optimisation problems.
3. Use mathematical software to solve the proposed models.
4. Develop a report that describes the model and the solving technique, analyse the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.

Course Objectives:
1. Methodology of Operations Research.
2. Linear programming: solving methods, duality, and sensitivity analysis.
3. Integer Programming.
4. Network flows.
5. Multi-criteria decision techniques.
6. Decision making under uncertainty and risk.
7. Game theory.

Unit 1   **16 hrs**
1.1 Definition of the term Operation Research – Different Phases of O.R. Advantages and Limitations of O.R.
1.2 Standard Linear Programming – Formulation of a Linear Programming

1.3 Solving L.P.P. by Graphical Method Problem. Simplex Method.
Unit 2   **16 hrs**
2.1 Transportation Model Problems –
2.1.1 Assignment Problem.
2.1.2 Method of finding initial basic feasible solution to Transportation problem- North West Corner, matrix Minima and Vogel's Method.
2.1.3 Method of finding initial basic feasible solution to Assignment Problem using Hungarian Method.
Unit 3   **16 hrs**
3.1 Dual Simplex Method, Big M method revised simplex method, duality theorems
3.2 Sequencing Problems – Processing 'n' jobs through two machines – Travelling
3.3 Salesman Problems as an application of Sequencing.

Text Books:
1. "Operation Research", by Kanthiswarup, Gupta, Manmohan – Sultan chand and sons, Educational Publishers, New Delhi, 1996.
Reference Books :
1. "Operation Research", by S.DaranivenkatakrishnanKeerthi Publishing House 1997.
2. "Operation Research", by H.A.Taha Prentice Hall of India Ltd 1998.
3. "Operation Research", by S.D.SharmaKedarnathRamnath and co (Publishers) 1997

BCA SEMESTER-V
TITLE:Analysis and Design of Algorithms
[Elective – I] (5BCA55)
Class Duration : 16 Weeks with 3 Hours a week = 48Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Learning Objectives:
1. **Analyze** the asymptotic performance of **algorithms**. ...
2. Demonstrate a familiarity with major **algorithms**and data structures.
3. Apply important algorithmic**design** paradigms and methods of **analysis**.
4. Synthesize efficient **algorithms** in common engineering **design** situations.

Learning Outcomes:
1. **Write** rigorous correctness proofs for algorithms.
2. Demonstrate a familiarity with major algorithms and data structures.
3. Apply important algorithmic design paradigms and methods of analysis.
4. Synthesize efficient algorithms in **common** engineering design situations.

Unit 1	**20 hrs**

1.1 Introduction: Definition of Algorithm, Areas of algorithm study.
1.2 Performance analysis- space complexity, time complexity
1.3 Asymptotic notations-- big Oh - big omega - little Oh – little omega and theta
1.4 notations.
1.5 Recurrence equations - Substitution Method, Changing variables, Master's
1.6 Theorem.
Divide and Conquer method: use, Examples: Binary search,Merge sort,   quick
Sort.
 Performance measurement of Binary Search ,quick sort, Selection
sort,Insertionsort,Mergesort,Heap sort.

UNIT II	**14 hrs**

2.1 Dynamic programming –General method, multistage graphs, multistage
2.2 graphs, all-pairs shortest path, Single source shortest path, optimal binary search
2.3 trees - Floyd-Warshall algorithm .
2.4 Greedy method : General method, Knapsack problem, Minimum cost spanning
trees -Prims algorithm, Kruskals algorithm.

UNIT III	**14 hrs**

3.1 Backtracking - General method,Graph coloring.
3.2 Complexity Theory - Introduction. P and NP. NP-Complete problems

Text book
1. Anuradha A Puntambekr "Analysis of Algorithm and Design"
2. T. H. Cormen, C. E. Lieserson, R. L. Rivest, Introduction to Algorithms, Prentice Hall India,2004.
3. Horowitz Ellis, SahaniSartaz, R. Sanguthevar " Fundamentals of Computer Algorithms".
4. Dromey   -" How To Solve It By Computer"

BCA SEMESTER-V
Elective – I] (5BCA56)
TITLE:Web Designing and PHP
Class Duration : 16 Weeks with 4 Hours a week = 48 Hrs
MARKS THEORY 70+ INTERNAL ASSESSMENT 30= 100

Course Objectives:

1. To learn the syntax and semantics of HTML
2. Navigating Adobe Muse
3. To quickly be able to understand the different parts of a web page
4. Learn how to setup your site
5. Work with master pages and pages)
6. To be able to create a site independently
7. Publish and export your site

Learning Outcomes:

1. How to plan out a website
2. The basics of optimizing your website
3. How to create a layout for webpages and your entire site
4. How to add elements to your web pages, including colors, text, images, and more
5. How to add advanced features to your website including special effects and widgets
6. How to publish your website to the Internet

UNIT I	08hrs

1.1	**Internet: I**ntroduction to HTML and web page authoring using HTML. Web design: web
1.2	design, web design process,
1.3	Image basics:URL, hyperlinks Hspace, Vspace, height, width, image as buttons, text
1.4	alignment color settings ,Tables lists, types of lists.
1.5	Frames:Frameset,Frametargeting,Horizontalsplitting,Vertical splitting
1.5	
1.6	Input fields:Textbox,Password,Button,Drop down list box,Radiobutton,Checkboxes,Submit/reset buttonMethods get/post
1.7	Style sheet:Settingbackground,Repeating background image,Setting text color,Textalignment,Textdecoration,Font and formatting

Borders – different borders on each side, margin, padding, list and positioning and alignment of an image. Placing an element behind another.

UNIT II	08hrs

2.1	Scripting languages,Java script introduction and history
2.2	**Scriptbasics:**Syntax,Variables,Keywords,Primitivetypes,Referencetypes,Operators,Statements,Functions
2.3	**Java script in the browser**

1. Java script in HTML
2. The <script> tag a. external file format b. inline code versus external files c.

tag placement d. the <nonscript> tag

   3. The browser model- the window object, the document object, the location object, the navigator object, the screen object.

UNIT III	09 hrs

3.1 PHP: Introduction to PHP, Server side scripting,configuration of PHP,,Installing PHP,PHP
3.2 structure and Syntax. Rules of PHP syntax variables and scope,echo and print, data types .,
   PHP Operators.Conditional Structure and Looping,Arrays in PHP,Userdefined functions in
3.3 PHP,Variable Function:(gettype, settype, isset, strval,floatval,intval,print_r), string functions,
3.4 MATH functions,
   Array Functions
3.5

Text Books :
1.HTML Back Book
2The complete reference HTML(2 Edition)
3.Jim Converse & Joyce Park, PHP & MySQL Bible, Wiley
Reference Books:

1. HTML 4 FOR DUMMIES Author : ED TITTEL & MARY BUR
MEISTER Publishers: Wiley
2. Beginning PHP D W Mercer,AKent,S D NowickiPublisher:Wrox
3. PHP & MYSQL FOR DUMMIES, 3RD ED Author : JANET VALADE Publishers: Wiley

*****

BCA SEMESTER-V

TITLE:Web Designing and PHP lab
Class Duration : 16 Weeks with 4 Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

1.Write a PHP program to display "Hello Word" using echo statement
2.Write a PHP program to add two numbers and display the result
3.Display strings of text using print statement
4.PHP program to read a string and display the reverse of a string
5.PHP program to read two strings and find out the length of the strings and display in concatenated form
6.Find biggest of two numbers using PHP
7.PHP program to sort the data of an indexed array in alphabetically ascending order
8.PHP program of addition of n numbers using while loop
9.Implementation of foreach loop in PHP
10.Read and display students details using PHP
11.Implementation of two dimensional array in PHP
12. Write a PHP program to Get current date and time
13.Write a PHP program to get current time as timestamp, convert timestamp to human readable date and time
14.Create a table 'employee' and insert employee details to the table using PHP and Mysql
15. Update and delete details of employee from the employee table using PHP and Mysql

Learning Objectives:

5. To provide a contemporary and forward-looking on the theory and practice ofEnterprise Resource Planning Technology.
6. To focus on a strong emphasis upon practice of theory in Applications and Practical-oriented approach.
7. To train the students to develop the basic understanding of how ERP enriches the business organizations in achieving a multidimensional growth.
8. To aim at preparing the students technological competitive and make them ready toself-upgrade with the higher technical skills.

Learning Outcomes:

5. Make basic use of Enterprise software, and its role in integrating business functions
6. Analyze the strategic options for ERP identification and adoption.
7. Design the ERP implementation strategies.
8. Create reengineered business processes for successful ERP implementation.

UNIT I		**14 hrs**
1.1	Media and data streams: Properties of multimedia systems, Data stream Characteristics:	
1.2	Digital representation of audio, numeric instruments digital interface Bark concepts,	
1.3	Devices, Messages, timing standards speech generation, analysis, and transmission.	
1.4	Digital Image: Analysis, recognition, transmission.	
1.5	Video: Representation, digitalization, transmission. Animation: Basic concepts, animation languages, animation control transmission.	

UNIT II		**16 hrs**
2.1	Animation: Basic concepts, animation languages, animation control transmission.	
2.2	Data compression standards: JPEG, H-216, MPEG DVI.	
2.3	Optical storage devices and standards: WORHS, CDDA, CDROM, CDWO, CDM.	
2.4	Real time multimedia, Multimedia file system.	

UNIT III		**16 hrs**
3.1	Multimedia Platforms – Limitations of the personnel computer, evaluation of the	
3.2	Multimedia PC, Multimedia hardware and Multimedia software.	
3.3	MultiMedia Communication System: Collaborative computing session management, transport subsystems, QOS, resource management.	
3.4	Multimedia Databases: Characteristics, data structures, Operation integration in a	
3.5	database model. Synchronization: Issues, presentation requirements, reference to multimedia	
3.5	synchronization, MHEG. Multimedia Application: Media Preparation, Composition, integration communication,	
3.6	consumption, and entertainment.	

RALPH Stein, Metz Clara, Nahrstedit, "Multimedia: Computing, Communication and Applications", 1st edition 1995.
1. John.F.Koegel Buford, "Multimedia Systems", Addison Wesley 1994.
2. Mc Carty, T.P. "Multimedia Communications", John Wiely, 1990.
3. Judith Jeffcoate, 'Multimedia in Practice (Theory and Applications)", PHI 1998.

BCA SEMESTER-V

TITLE:SOFTWARE TESTING AND QUALITY ASSURANCE
Elective II (5BCA62)
Class Duration : 16 Weeks with 3Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Learning Objectives:

1. Employ correct testing terminology throughout the testing process.
2. Execute specific software tests with well defined objectives and targets.
3. Apply various testing techniques, including domain, code, fault, usage and model-based.
4. Execute program and test evaluations.
5. Perform a complete testing process, taking into account practical considerations.

Learning Outcomes

1. Various test procesess and continuous quality improvement
2. Types of errors and fault models
3. Methods of test generation from requirements
4. Behavior modeling using UML: Finite state machines (FSM)
5. Test generation from FSM models
6. Input space modeling using combinatorial designs
7. Combinatorial test generation
8. Test adequacy assessment using: control flow, data flow, and program mutations
9. The use of various test tools
10. Application of software testing techniques in commercial environments

UNITI   **16hrs**

1.1   **Software testing background:** What is a bug: terms for software failures, software bug: formal definition, why do bugs occur, cost of bugs, software development process: s

1.2   **S**oftware development life cycle model: big bang model, code and fixed model, waterfall model, spiral model, Examining the specification: white box: Static and Structural testing.

1.3   **Testing Fundamentals:** Black box testing: What is black box testing? Why black box testing? When to do black box testing? Requirements based testing, boundary value analysis, decision tables, equivalence partitioning, state based or graph based testing, compatibility testing, user documentation testing, domain testing.

UNIT II   **16hrs**

2.1   **Integration testing:** Top-Down, Bottom-up, Bi-directional, system integration. System Testing: System and Acceptance Testing: Acceptance criteria, selecting test cases for acceptance testing, executing acceptance tests.

2.2   **Performance testing:** Methodology for performance testing: Collecting requirements, writing test cases, automating test cases, executing test cases. Regression testing. Usability testing: user interface testing, configuration testing: isolating configuration bugs.

UNIT III   **16 hrs**

3.1 **Applying testing skills:** testing the documentation: types of software documentation, importance of documentation testing, automation, goals of test case planning, test case planning overview: test design, test cases, test procedures, test case organization and tracking, software quality assurance: software testing, quality assurance, capability Maturity Model(CMM), ISO 9000.

3.2 **Software test automation:** what is test automation, terms used in automation, skills needed for automation, scope of automation, design and architecture for automation, selecting a test tool? Test metrics and Measurements: Why metrics in testing, types of metrics, project metrics: Effort variance, Schedule variance, effort distribution across phases. Progress metrics: test defect metrics, development defect metrics.

Text Book:
1: Software Testing: Srinivasan Desikan
2: Software Testing : Ron, Patton Publisher

******
BCA SEMESTER-V
TITLE:SOFTWARE TESTING AND QUALITY ASSURANCE LAB
Elective II
Class Duration : 16 Weeks with 6Hours a week = 96Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

1.   Introduction Introduction
    a. Software Testing
    b. Testing methods
    c. Testing levels
    d. Methods of Software Testing
2. Test Scenarios
3. Test Case:
    a. Writing Test Cases
    b. Test case execution
4. SCENARIOS
    a. SCENARIO TO LOG IN TO FLIGHT APPLICATION
    b. SCENARIO TO LOG OUT
    c. SCENARIO TO BOOK A TICKET
    d. SCENARIO TO UPDATE THE ORDER
    e. SCENARIO TO DELETE AN ORDER
    f. SCENARIO TO OPEN AN ORDER
    g. SCENARIO TO VIEW AGENTS REPORTS
    h. SCENARIO TO VIEW TOTAL NUMBER OF TICKETS SOLD
5. Test Cases:
    a. Flight Reservation:
        i. functional test cases
        ii. Integration Test cases
        iii. System test cases

6. AUTOMATION- QTP
   a.   Introduction to QTP
   b.   Record, Run and Analyzing Test.
   c.   Perform multiple actions.
   d.   Inserting checkpoints.
       i.   Standard Checkpoint
      ii.   Image Checkpoint
     iii.   Table Checkpoint
      iv.   Text Checkpoint
       v.   Text Area Checkpoint
      vi.   Bitmap Checkpoint
     vii.   Database Checkpoint
7. Working with Data Tables

****

BCA SEMESTER-V
TITLE:: Mobile Communication [Elective – II](5BCA63)
Class Duration : 16 Weeks with 3Hours a week = 48Hrs
MARKS THEORY70 + INTERNAL ASSESSMENT 30 = 100

Objectives:
.1.To make students familier with fundamentals of mobile communicationsystems
2. To choose system (TDMA/FDMA/CDMA) according to the complexity, installation cost, speed of transmission, channel properties
etc.
3. To identify the requirements of mobile communication as compared to static communication
4. To identify the limitations of 2G and 2.5G wireless mobile communication and use design of 3G and beyond mobile communicationsystems
Learning Outcomes
1. To make students familiar with various generations of mobile communications
2. To understand the concept of cellular communication
3. To understand the basics of wireless communication
4. Knowledge of GSM mobile communication standard, its architecture, logical channels, advantagesand limitations.
5. Knowledge of IS-95 CDMA mobile communication standard, its architecture, logical channels, advantages andlimitations.
6. Knowledge of 3G mobile standards and their comparison with 2G technologies.
7. To under multicarrier communication systems.

UNIT I   **16 hrs**

1.1   Introduction to Cellular mobile systems: Basic cellular mobile systems, performance criteria, operation of cellular systems, planning a cellular system, analog and digital cellular systems.

1.2   Elements of cellular Radio system design: Concept of frequency reuse channels, co-channel interference reduction factor, hand-off mechanism, cell splitting, consideration of the components of the cellular systems.

1.3   Co-channel interference Reduction: Co-channel Interference, exploring co-channel Interference areas in a system, Real-time co-channel interference, measurement at mobile radio receivers, Power control, designing a system to serve a predefined area that experiences co-channel Interference.

UNIT II   **16 hrs**

2.1   Frequency Management and Channel Assignment: Frequency management, Frequency spectrum utilization, set-up channels, Definition of co-channel assignment, fixed channel assignment, non-fixed channel assignment algorithms, perception of call blocking from subscribers.

2.2   Hand-offs and Dropped Calls: Initiation of hand off, delaying a hand off, forced hand off, queuing hand off, power difference hand off, Mobile Assisted hand off (MAHO) and soft hand off. Cell site hand off, Intersystem hand off. Introduction to dropped call rate.

2.3   Introduction Digital Systems: ARQ techniques, Digital speech, digital mobile telephony, Practical multiple access schemes.

UNIT III   **16 hrs**

3.1   Digital Cellular systems: Global System for Mobile (GSM), North American TDMA, CDMA, Miscellaneous such as PDC, CT –2, DECT, CDPD, PCN and PCS.

3.2   Intelligent concept and applications: Intelligent cell concept, applications of intelligent μ cell systems, in-building communication, CDMA cellular radio network.

3.3   Intelligent network for wireless communications: Advanced Intelligent Network (AIN), SS7 network for ISDN, and AIN, AIN for mobile communications, an intelligent system Future public Land Mobile Telecommunication System (FPLMTS), Wireless ATM
networks, wireless information superhighway.

References:
1. Rappaport, "Wireless Communication", Pearson Education, 2/e, 2002.
2. William C.Y.Lee, "Mobile Cellular Telecommunications: Analog and Digital
   Systems", 2/e, McGraw-Hill Electronic Engineering Series, 1995.
3. William C.Y.Lee, "Mobile Communication Engineering", Mc-Graw Hill, 1997.
4. Mike Gallegher, Randy Snyder, "Mobile Telecommunications Networking with IS-
   41", McGraw Hill, 1997.
    1. Kernllo, Feher, "Wireless Digital Communications", PHI, 2001.

*****

BCA SEMESTER-V
TITLE:GRAPH THEORY[Elective –II](5BCA65)
Class Duration : 16 Weeks with 4 Hours a week = 48Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Learning Objective
1. Understand basic notions of Graph Theory
2. Knowing Fundamental Theorems in Graph Theory
3. Study of algorithmic Graph Theory

UNIT I   **09 hrs**

    1.1   Graphs – Introduction – Isomorphism – Sub graphs – Walks, Paths, Circuits – Connectedness – Components – Euler Graphs – Hamiltonian Paths and Circuits –

    1.2   Trees – Properties of trees – Distance and Centers in Tree – Rooted and Binary Trees.

UNIT II   **09hrs**

    2.1   Spanning trees – Fundamental Circuits –Spanning Trees in a Weighted Graph

    2.2   Dijkstra's Shortest Path Algorithm, Minimal Spanning Trees – The algorithms of Kruskal and Prim, Transport Networks – Max-flow, Min-cut Theorem

    2.3   Cut Sets – Properties of Cut Set – All Cut Sets – Fundamental Circuits and Cut Sets – Connectivity and Separability – Network flows – 1-Isomorphism – 2-Isomorphism – Combinational and Geometric Graphs

    2.4   – Planer Graphs – Different Representation of a Planer Graph.

UNIT III   **10 hrs**

    3.1   Incidence matrix – Submatrices – Circuit Matrix – Path Matrix –

    3..2   Adjacency Matrix – Chromatic Number – Chromatic partitioning –

    3.3   Chromatic polynomial - Matching - Covering – Four Color Problem –

    3.4   Directed Graphs – Types of Directed Graphs – Digraphs and Binary

    3.5   Relations – Directed Paths and Connectedness – Euler Graphs – Adjacency Matrix of a Digraph.

    3.6   Algorithms: Connectedness and Components – Spanning tree – Finding all Spanning Trees of a Graph –Set of Fundamental Circuits – Cut Vertices and Separability – Directed Circuits.

TEXTBOOK
1. NarsinghDeo, "Graph Theory: With Application to Engineering and Computer Science",PHI,2003.

REFERENCE
1. Graph Theory and Combinatorics, Dr. D.S. Chandrasekharaiah, Prism, 2005.
2. R.J. Wilson, "Introduction to Graph Theory", Fourth Edition, Pearson Education, 2003.

*****

BCA SEMESTER-VI
TITLE: Android Programming
Class Duration : 16 Weeks with 4 Hours a week = 48 Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

Learning Objective

1. Understand the Android OS architecture.
2. Install and use appropriate tools for Android development, including IDE, device emulator, and profiling tools.
3. Understand the Android application architecture, including the roles of the task stack, activities, and services.
4. Build user interfaces with fragments, views, form widgets, text input, lists, tables, and more.
5. Use advanced UI widgets for scrolling, tabbing, and layout control.
6. Present menus via the Android action bar and handle menu selections.
7. Store application data on the mobile device, in internal or external storage locations.
8. Support user-specific preferences using the Android Preferences API

UNIT I   **09hrs**
1.1   Introduction of Android.Android computing platform, History of android, android software stack, android SDK, Developing end user application using android SDK, android java packages, Structure of android application

1.2   Setting up the development environment, Installing android development tools (ADT), Fundamental components, Android virtual devices(Emulators), Running on real device, Application life cycle

UNIT II   **09hrs**
2.1   User Interface Develement in Android, Developing UI using XML with code, Android's common controls ,
2.2   understanding adapters, adapter views, list view, grid view, spinner control, gallery control, styles and themes,
2.3   Understanding layout managers, linear layout manager, table layout manager, relative layout manager, frame layout manager, grid layout manager.
2.4   Understanding android resources , String resources,Layout resources, Defining own resource IDs , string arrays, Colour resources, dimension resources, image resources, Android menus , creating menus, working with menu groups, responding to menu items, icon menu, sub menu

UNIT III   **10hrs**
3.1   Android services:fragments in android ,structure of fragment, fragment life cycle, Intents, Linking Activities using intents, Fragments, Calling Built in applications using intents, Displaying Notifications.
3.2   Content proveiders, Sharing Data in Android, Using a Content Provider, Creating Your Own Content Providers.Basic operations using SQLITE database.
3.3   Messaging -SMS Messaging, Sending Email. Location based Services.
UNIT IV   **07hrs**

4.1   Persisting data / Files, saving state and preferences, saving application data, creating, saving and retrieving shared preferences,

4.2   SQL and database centric data model for android, android database classes. Consuming Webservices using HTTP, Consuming JSON Services,

TEXT BOOK
 1.   Wei-MengLee,"Beginning Android 4 Application Development", Wrox publications, 2012
REFERENCES
1.The Android Developer's Cookbook: Building Applications with the Android SDK James Steele,

Nelson to Addison Wesley Publications 2010 First Edition.

2.Professional Android Application Development. Reto Meier, Wrox publications, 2009,   Second

Edition

BCA SEMESTER-VI
TITLE: Android Programming lab
Class Duration : 16 Weeks with 6 Hours a week = 96Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30= 100

1. Java android program to build simple android application (Default display "Hello World")

2. Java android program to demonstrate the usage of String.xml file

3. Java android program to change the background of your activity

4. Java android program to change the image displayed on the screen

5. Java android program to create three text boxes(Edit Text and Text field),and a button (name add) read two numbers and display the result in other textbox

6. Java android program to create multiple activities within an application

7. Java android program to demonstrate Action Button by implementing onClickListener

8. Java android program to demonstrate the use of List view

9. Java android program to demonstrate the use of Scroll view

10. Java android program to demonstrate radio group application

11. Java android program to demonstrate the Alert Dialog Box

12. Java android program to display a toast message in your application

13. Java android program to demonstrate menu application

14. Java android program to implement spinner in your application

15. Java android program to implement different layout in an activities

16. Java android program to demonstrate an Adapter

17. Java android program to demonstrate explicit intent

18. Java android program to demonstrate implicit intent

19. Java android program to implement the simple compound control

20. Create a table 'student' with 4 field names(rollno,name,sub1,sub2and total) and insert student details using sqlitedatabse in android

21. Java android program to display student details on an activity from above student table

22. Create a table employee and demonstrate insert, update and delete operation using

sqlite database

23. Create table student in Mysql database and insert data from android activity page into the table

24. Android program to display students details on an activity from Mysql database

25. Java android program to demonstration of Json parsing

BCA SEMESTER-VI
TITLE: Python
Class Duration : 16 Weeks with 4 Hours a week = 48 Hrs
MARKS THEORY 70+ INTERNAL ASSESSMENT 30 = 100

Course objectives: This course will enable students to
1. Learn Syntax and Semantics and create Functions in Python and Use pythoninteractively
2. Handle Strings and Files inPython.
3. Understand Lists, Dictionaries inPython.

Course outcomes: The students should be able to:
1. Examine Python syntax and semantics and be fluent in the use of Python flow control andfunctions.
2. Demonstrate proficiency in handling Strings and FileSystems.
3. Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries.

UNIT I   **07hrs**
1.1   Python programming overview,Basic elements of Python,Variables,Gobalvariable,Datatypes,fileobjects and I/O,Comments
1.2   and Documentation, Simplestatements,Compundstatements,Conditional:if/elif/elseControl
1.3   structures,
1.4   Iteration,whileloop,for loop, Functions and scopes : parameters ist,recursion

UNIT II   **08hrs**
2.1   Class Definition , Syntax,Classes attributes ,classes attributes VsInstancesattribuattribute,Defining functions in class,methds,
2.2   Customizing objects, __init__ Method,__del__ Method,__repr__ Method,__str__Method,
2.3   Inheritance:attributereference,
2.4   Plymorphism:attributereference,Encapsulation and information hiding

UNIT III   **08hrs**
    3.1   Strings,Tupes,Lists and Dictinaries,Lists and Mutability
    3.2   Modules,Predefind module attribute,importing,
    3.3   Exception handling in Python :Exception,The raise statements,The try statements,other keywords to handling exceptions,
    3.4   The standard exception heirarchy.

UNIT IV   **08hrs**
    4.1   Python on Web : Standard Python web modules,
    4.2   Database connectivity in Python – Installing mysql connector, accessing connector module module,
    4.3   using connect, cursor, execute& close functions, reading single &
    4.4   multiple results of query execution,
    4.5   executing different types of statements,
    4.6   connectivity Algorithm, Searching and Sorting

Text Books:
1.The Complete reference -Python
Reference Books:
1. Operating System Design and Implementation by Andrew S Tanenbaum - Prentice Hall India, 1990.
2. Operating system principles by Brinch Hansen. P., PHI.
3. Operating systems by Milan Milenkovic., McGraw Hill.
4.Logical design of operating systems by Show.A., PHI

*****

BCA SEMESTER-VI
TITLE: Python lab
Class Duration : 16 Weeks with 6 Hours a week = 96Hrs
MARKS THEORY 70 + INTERNAL ASSESSMENT 30 = 100

1.Python program to display your name

2.Write a Python program to add two numbers

3.Write a program to check whether the number is odd or even

4.Write a program to check whether the number is positive or negative

5.Write a program to display biggest of two numbers

6.Write a program to printout all the given elements in an array

7.Write a program to read n elements into an array and display the numbers less than 10

8. .Write a program and determine whether that number is prime or not

9. Define a class which has atleast two methods 1.getString :to get a string from console input

2.printString:to print the string in upper case

10.Write a program to read a string and check whether the string is palindrome or not

11.Write a program to read a list of numbers and return a new list that contain all the even numbers

12. Implementation of Fibonacci series in Python

13.Write a program to read a list of numbers and search whether the given number is there or not using linear search

14. Write a program to read a list of numbers in ascending order and search whether the given number is there or not using binary search

15. Read two list of elements and return a new list that contain only the elements that are common between the lists

16.Write a program to return the reverse order of a string

17.Implementation of two dimensional array in Python

18.Write a program to find out the biggest of three numbers

19 .Write a program to list all the prime numbers from the given array of numbers

20.Compute the factorial of a number using function

21.Write a program that accepts sequences of lines as input and prints the lines after making all characters in sentence capitalized

22Write a program that accepts a sentence and calculate the number of letters and digits

23.Write a program to sort (name,age,height)tuples by ascending order where name is string and age and height are numbers.The sort criteria is 'sort based on name'.
24.Define a class with a generator which can iterate the numbers, which are divisible by 7 between a given range 0 and n.
25.Write program to find out the square root of a number

BCA SEMESTER-VI
TITLE:6BCA1:PROJECT WORK
Hard Core
Class Duration : 16 Weeks with 24 Hours a week = 384Hrs

Project Guide Lines
- *Maximum 2 students shall be allowed to take up a project.*
- *Each student will have to work for 24 hours per week whether in the college premises or outside. If a student opts for industrial outside project, a college teacher has to be an internal guide. In this case the student has to report/present his/her progress twice in a week.*

- *Guiding one project shall be considered as 4 hours of practical per week as the work load for hte concerned internal guide.*
- *Each student shall submit his/her project synopsis to the concerned guide within 15 days in consultation with internal guide from the commencement of the respctive semester.*
- *Each student has to carry out 2 project seminars compulsorily in project duration.*
- *Each seminar will be considered for thier internal assessment.*

Scheme of Valuation -200 marks
- IA – 60 Marks
  - Synopsis   -   20 Marks
  - Seminar 1   -   20 Marks
  - Seminar 2   -   20 Marks
- Dissertation   -100 Marks
  - Documentation   - 40 Marks
  - Presentation / Demonstration - 60 Marks

- Viva   - 40 Marks

Note: During the practical examination maximum 5 projects have to be evaluated in a batch with an external examiner.

II SEMESTER
Discipline Specific Elective (DSE or /Soft Core (SC)

TITLE: INTERNET TECHNOLOGY
Discipline specific elective (DSE1)
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Objectives: The aim of the course is to acquaint the students with the basics of internet technologies..

UNIT I		10 Hours
1.1	**Internet overview:**definition, internet evolution, advantages and disadvantages ofinternet	
1.2	Internet reference model-OSI model , TCP/IP reference model	
1.3	**Domain name system-**DNS architecture, working of DNS, types of nameservers	
1.4	**Internet services-**communication services, information retrieval services, web services	
1.5	**Internet protocols**	
UNIT II 2.1	**Email –**email protocols, email working, email operations, email security,email hacking ,email spamming and junk mails, Emailproviders	10 Hours
2.2	**Website designing-**web development process, web designing tools, website hosting	
2.3	www- architecture, evolution	
UNIT III	Proxy server	10 Hours
3.1	**Web browsers, search engine components,**	
3,2	**Internet relay chat**	
3.3	**video conferencing -**modes of video conferencing	
3.4	**Internet security –**threats, email phishing, digital signature	
3.5	**Markup Languages , Scripting Languages, Style Sheets**	

Text Books:Fundamentals of information technology by Alexis Leon
Reference Books: Advanced internet technology by Deven Shah

Discipline specific elective (DSE2)
TITLE: Computer security
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Objectives:
The aim of the course is to acquaint the students with the basics of internet technologies..
Course Learning Outcomes: At the end of the course the students will be able to Review the current topics in Web & Internet technologies Describe the basic concepts for network implementation..Learn the basic working scheme of the Internet and World Wide Web. Understand fundamental tools and technologies for webdesign. Comprehend the technologies for Hypertext Mark-up Language(HTML).Specify design rules in constructing web pages and sites.

UNIT I **Computer SecurityOverview:**	
1.1 Why Security? What to Secure? Benefits of Computer Security Awareness , Potential Losses due to Security Attacks , Basic Computer Security Checklist.	**11 Hours**
1.2 **Computer Security – Elements**:Different Elements in Computer Security , Computer Security –Terminologies, Computer Security – Layers	
UNIT II **Computer Security – Antivirus**: **2.1**	**10 Hours**
Antivirus ,Basic Functions of Antivirus Engines , Free Antivirus Software , Avast Antivirus , AVG Antivirus , Panda Antivirus 2016 , Commercial Antivirus .	
2.2 **Computer Security – Malwares:**	
Characteristics of a Virus , Detecting a Computer Error from a Virus Infection	
UNIT III **Computer Security –Encryption:** **3.1**	**11 Hours**
3.2 What is Encryption? Tools Used to Encrypt Documents.	
Computer Security – Data Backup:	
3.3 Why is Backup Needed? Backup Devices, Types of Backups Based on Location.	
Computer Security – Disaster Recovery:	
Disaster recovery definition, Preventive steps to be taken for Disaster Recovery, Computer Security, Devices that Help us with Network Security , Intrusion Detection Systems , intrusion detection tool – Snort, Virtual Private Network .	

Text Books:. Fundamentals of information technology by Alexis Leon

Reference Books: Advanced internet technology by DevenShah

Discipline specific elective (DSE3)
TITLE: COMPUTER GRAPHICS
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Objective of the course: The goal of this course is to provide an introduction to practice of computer graphics. The course will assume a good background in programming in C or C++ and a background in mathematics including familiarity with the theory and use of coordinate geometry and of linear algebra such as matrix multiplication.

Course Outcome: Have a basic understanding of the core concepts of computer graphics.Be capable of using OpenGL to create interactive computer graphics.Understand a typical graphics pipeline.Have made pictures with their computer.

UNIT I	Raster Graphics Algorithm for 2Dprimitives	10 Hours
1.1	Introduction-output Technology-Raster and Vector display system, Software	
1.2	Portability and graphic standards;	
1.3	Conceptual Framework of Interactive graphics	
	Scan converting-Lines,circles,Filling, Thick primitives, Line Style ,pen style, Clipping in Raster World, Clipping Lines, Generating characters	

UNIT II	**2D Graphics**	12 Hours
2.1	2D Transformations, Homogenous coordinates, Matrix representation of 2D Transformation, computation of 2DTransformation.	
2.3	**3D Graphics** Matrix representation of 3D Transformation, computation of 3DTransformation., Transformations as change in coordinate systems	

UNIT III	**Multimedia**	9 Hours
3.1	Introduction, Multimedia data streams	
3.2	sound and audio file formats, images and graphics file formats and optical storage media	

Text Books:

1.Foley J.D Van Dan A. Fundamentals of interactive computer graphics, Addison Wasley

2.Multimedia computing, communication and application by Rolfsteinmetz,Redson

Education

Reference Books:

1. Hearn.D Baker P.M COMPUTER GRAPHICS(PHI)

2.Rogers D.F Adam J:Mathematical Elements of computer graphics, McGraw Hill

II SEMESTER
Discipline specific elective (DSE4)
TITLE: Software Engineering
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Objectives of software engineering:
Software engineering is the **study** and application of **engineering** to the design, development, and maintenance of **software**. Typical formal definitions of **software engineering** are: "the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of **software**.

Course Learning Outcomes:

A. Foundation: Graduates shall have strong foundation in science, mathematics, and engineering, and can apply this fundamental knowledge to software engineering tasks.

B. Development: Graduates can effectively apply software engineering practice over the entire system lifecycle. This includes requirements engineering, analysis, prototyping, design, implementation, testing, maintenance activities and management of risks involved in software and embedded systems.

C. Process: Graduates know classical and evolving software engineering methods, can select and tailor appropriate methods for projects, and can apply them as both team members and managers to achieve project goals.

D. Professionalism: Graduates are knowledgeable of the ethics, professionalism, and cultural diversity in the work environment.

E. Quality: Graduates can apply basic software quality assurance practices to ensure that software designs, development, and maintenance meet or exceed applicable standards.

F. Presentation: Graduates have effective written and oral communication skills. Graduates can prepare and publish the necessary documents required throughout the project lifecycle. Graduates can effectively contribute to project discussions, presentations, and reviews.

G. Growth: Graduates understand the need for lifelong learning and can readily adapt to new software engineering environments.

UNIT I	**Software engineering:**	
1.1	Software overview**,** Definitions ,software evolution, need of software engineering, characteristics of a good software	**12 Hours**
1.2	**software development paradigm**-waterfall model, iterative model, spiral model	
1.3	**Software development life cycle**-requirement gathering, feasibility study, system analysis, software design,coding,testing,integration,implementation,operationsandmaintenance	

UNIT II	**Software project management-project planning**	**8 Hours**

2.1	Software project management-project planning,project estimation, project scheduling, project management tools	
2.2	**Software requirements-**Requirement engineering process, software requirement characteristics, User interface requirements	

UNIT III		
3.1	**Software design:**software design rocess,Modularization,coupling and cohesion	
3.2	**Software analysis and design tools**-data flow diagram ,structure charts,ER model, data dictionary	**13 Hours**
3.3	**Software design strategies-**structured design, function oriented design, object oriented design**,**	
3.4	**software design approaches** –top down design bottom –up design **Software testing** –software verification,validation,testing approaches,testinglevels,quality control andassurance	
	Software maintenance overview	
3.5		

Text Books:
1. Software Engineering-IAN Somerville
2. Software Engineering by Pankajjalote

Reference Books:

1. **software engineering by Rajib Mall**

*****

SEMESTER-III
Discipline Specific Elective(DSE1)
TITLE: Web Designing
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Course Objectives

- Understand the principles of creating an effective web page, including an in-depth consideration of information architecture.
- Become familiar with graphic design principles that relate to web design and learn how to implement these theories into practice.
- Develop skills in analyzing the usability of a web site.
- Understand how to plan and conduct user research related to web usability.

Learning Outcome:
   Learn the language of the web: HTML and CSS.
   Learn techniques of responsive web design, including media   queries.
   Learn CSS grid layout and flexbox.
   Develop skills in digital imaging (Adobe Photoshop.)
   Be able to embed social media content into web pages.

		NO. OF HOURS TAKEN
UNIT I 1.1	**HTML** Introduction tointernet, www, web browser, URL, web page, website,	
1.2	introduction to web designing, categories of websites, HTML, basic htmldocument, basic tags, text formatting tags**,** marquee**,** comments, hyperlinks, images,tables, frames, forms, <div> tag,<span>tag.	10 Hours

UNIT II

12 Hours

2.1   **CSS**

Introduction, advantages of CSS, syntax, CSS selectors, colors, fonts,adding CSS to html document ,inline, internal and external CSS, property-value forms, background property, float property, borders, margins, padding, Boxmodel.

UNIT III

  JavaScript

3.1		**10 Hours**
	Introduction, script, scripting languages, history, features,advantages,	
3.2	keywords, statements, variables, datatypes, operators, control structures,	
3.3	JavaScript loops, functions, window object,	
	methods of window object, form validation using Javascript,	

Text Books:
1. The Complete Reference HTML & CSS.
2. HTML 5 Black Book.

BCA SEMESTER- III
TITLE: Data Analysis with Excel
Discipline specific elective (DSE 2)
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Objective of Course: Understand key concepts in the field of Business Intelligence and its important role in helping businesses achieve their goals; Be more productive and creative in their use of Excel for business data analysis and reporting;
Use powerful excel functions like Lookup functions and others to undertake more dynamic calculations and analysis; as well as use Text functions to manipulate data into desired formats;

Course Outcome: Employ Goal Seek and Scenario Manager to conduct sensitivity analysis and solve practical business problems;Utilize PivotTables and slicers to conduct more
effective data manipulation and analysis;
Create effective charts and dashboards in Excelfor improved
data visualization;Import data from online and other sources into Excel tofacilitate analysis.

UNIT I	**Data Analysis**	**12 hours**
1.1	**Introduction:** Data Analysis, Types of Data analysis - Data Mining, Business Intelligence, Statistical Analysis, Predictive Analysis, text Analysis. Data Analysis with excel overview.	
1.2	**Basics –** Windows concept, windows border, title bar, maximize button, minimize button, restore button, close button, dialog box, name box, formula bar, worksheets, status bar, task pane	
UNIT II	**Data Entry and Charts**	
2.1	**Entering Data :** Moving around workbook using mouse, keyboard, To use the scrollbars, scrolling.	**10 hours**
2.2	**Data Entry:** Enter text and numbers, to enter information, cancel entry, editing the entry, entering dates, selecting cells with mouse and keyboard.	
2.3	**Charts:** Change in charts group, chart recommendations, fine tune charts quickly, select/deselect chart elements, format styles and colour.	
UNIT III	**Formulae and Functions**	
3.1	**Formulae:** Formulae, Typing formulae, entering formulae by pointing, errors in formulae, fill handle ad formulae, Bodmas with formulae.	**10 Hours**
3.2	**Functions:** basic functions, sum functions, Average function, Max function, Min Function.	
3.3	**Function Library:** Insert Function, Function box, Type a function, cell references, Absolute and Relative references.	

Text Books:
1. **Introduction to Excel 2010 by Stephen Moffat**
2. **Micosoft Excel 2010 Introduction by Curtis . D. frye**
3. **Excel Data Analysis tutorials.**
4. **Advanced Excel Tutorials**

Discipline specific elective (DSE 3)
TITLE: Access and Crystal Reports
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Objective of Course: Identify the terminology and functions common to most database management systems.
- Identify the qualities of valuable information.
- Identify the elements of good database design.
- Create and use tables.
- Create and use queries.
- Create simple reports and forms.
- Use the Access online Help feature.
- Discuss ethical issues connected to the use of databases.

Course Outcome: In this course, you will connect to a database to extract data and present it as a report. You will:Identify the elements of the Crystal Reports interface.Create and modify a basic report.Use formulas to calculate and filter data.Build a parameterized report. Group report data
.Enhance a report. Create a report using data from an Excel work book. Distribute data.

UNIT I	**MS Access Overview:** Introduction, Data definition,	**10Hours**
1.1	Data Manipulation, Data Control.	
	Objects: Tables, query, form, report, macro, module.	
1.2 **1.3**	**Create database:** Creating Database, data types, create table, adding data, create query data, query criteria, updatequery.	

UNIT II		
2.1	**Forms and report:** Create a form, modify a form, control and properties, and create a report, Built-infunctions.	
2.2		**11Hours**
	Relating data in Access: normalization, one-to-one relationship, one-to-many relationship, many-to-many relationship, creating relationship, wildcards.	

UNIT III **3.1**	**Crystal report Overview:** Benefits of crystal reports, **The FourEditions:**	
3.2	Standard, professional, developer and advanced editions.	**11Hours**
3.3	**Viewing report:** formatting a report, supplying crystals with data, viewing a report with crystal report.	
3.4 **3.5**	**GUI Navigation:** Menu bar, tool bar, format bar, data tab, formula button. **Design Environment:** Design canvas, structure mode, page mode, data explorer side bar. **Queries:** creating queries, editing query, query filter and filter condition, field object controls and modification, delete section, inserting objects, charts	

Text Books:
1. **Microsoft Access Introduction Quick Reference Guide by BeezixInc**
2. **How To Learn Microsoft Access by Andrei Besedin**
3. **Crystal Reports XI: The Complete Reference by George Peck**
4. **Crystal Reports XI for Dummies by Allen.G.Taylor**

Discipline specific elective (DSE1)
TITLE: Biometrics
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Course Objectives:
- Assess ways of how we identify people, identify different environments for biometric use, define biometrics, list the two main phases of a biometric system, define data capture, describe stability, and list biometric system attributes.
- Describe the formation of fingerprints, identify the characteristics of fingerprints, explain the role of the FBI in the development of fingerprint recognition, define minutiae points, and understand the different acquisition technologies.
- Understand the structure and identify the various components of the eye, explain how image processing is used in segmentation, define iris normalization, and list various metrics that determine image quality.
- Describe face standards, define face image formats, differentiate between local and global features, list factors that affect performance of facial recognition, define face detection, and understand how stability is desired when acquiring images
- Understand the cornea structure, list advantages and disadvantages of ear recognition, describe the retina capture process, define authenticity, classify the challenges with signature verification, explain the acquisition process for hand geometry, and identify different types of vein recognition devices.

Course Outcomes:

- An ability to apply knowledge of mathematics, science, and engineering
- An ability to design and conduct experiments, as well as to analyze and interpret data
- An ability to 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
- An ability to function on multidisciplinary teams
- An ability to identify, formulate, and solve engineering problems
- An understanding of professional and ethical responsibility
- An ability to communicate effectively
- The broad education necessary to understand the impact of security related solutions in a global, economic, environmental, and societal context
- A recognition of the need for, and an ability to engage in life-long learning
- A knowledge of contemporary issues

UNIT I   **10 Hours**

1.1   **BIOMETRICS** – Overview: What is Biometrics? What is a Biometric System? Evolution of Biometrics, Why Biometrics is Required? Basic Components of a Biometric System, General Working of a Biometric System, Biometrics Terminology, Application Areas ofBiometrics.

1.2
1.3   **BIOMETRIC MODALITIES**: Types of Biometric Modalities

PHYSIOLOGICAL MODALITIES: Fingerprint Recognition System, Facial Recognition System, Iris Recognition System, Hand Geometry Recognition System, Retinal Scanning System, DNA Recognition System

UNIT II

2.1   **BEHAVIORAL MODALITIES**: Gait Recognition, Signature Recognition System, Keystroke RecognitionSystem.

2.2   **VOICE RECOGNITION**: Voice Recognition System, Difference between Voice and SpeechRecognition.

2.3   **MULTIMODAL BIOMETRIC SYSTEMS**: Why Multimodal Biometrics is Required? Working of Multimodal Biometric System , Design Issues with Multimodal BiometricSystems

2.4   **BIOMETRIC MODALITY SELECTION**: Criteria for Effective Biometric System, Comparison of Various Biometric Modalities
BIOMETRIC SYSTEM PERFORMANCE: Performance Measurements

UNIT III

3.1   **PATTERN RECOGNITION AND BIOMETRICS**: Pattern Recognition in Biometrics, Components of Pattern Recognition, Popular Algorithms in Pattern Recognition

3.2   **SIGNAL PROCESSING AND BIOMETRICS**: What is a Signal? Signal Processing in Biometrics, Digital Signal Processing Systems (DSPs), DSP in Biometrics

3.3   **BIOMETRICS AND IMAGE PROCESSING**: Requirement of Image Processing in Biometrics.

3.4   **BIOMETRIC SYSTEM SECURITY**: Biometric System Vulnerability, Risks with Biometric System Security, Biometric System Security, Criteria for Generating Biometric Templates

Text Books:

1. Biometrics: Concepts and Applications by G.R Sinha and Sandeep B.Patil
2. Guide to Biometrics by Ruud M. Bolle , SharathPankanti, Nalinik.Ratha, Andrew W.Senior, Jonathan H. Connell , Springer 2009
3. Introduction to Biometrics by Anil k.Jain, ArunA.Ross, KarthikNandakum
4. Hand book of Biometrics by Anil K.Jain, Patrick Flynn, ArunA.Ross

*****

BCA SEMESTER-1V
Discipline specific elective (DSE2)
TITLE: Python Programming
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Course objectives: This course will enable students to
· Learn Syntax and Semantics and create Functions in Python and Use python interactively
· Handle Strings and Files in Python.
· Understand Lists, Dictionaries in Python.

Course outcomes: The students should be able to:
· Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.

· Demonstrate proficiency in handling Strings and File Systems.

· Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries .

UNIT I

1.1	**Introduction To Py Python-Overview:** History of Python, Python Features Understanding Python variables , Python basic Operators, Understandingpython	**10 Hours**
1.2	blocks **Python Data Types**: using Numeric data types: int, float, complex Using string data type and string operations Defining list and list slicing Use of Tuple data type	
1.3	**Python Program Flow Control:** Conditional blocks using if, else and elif, Simple for loops in python For loop using ranges, string, list and dictionaries, Use of while loops in python.Loop manipulation using pass, continue, break and else Programming using Python conditional and loops block.	

UNIT II

2.1	Python Functions, Modules And Packages: Organizing python codes using functions Organizing python projects into modules Importing own module as well as external modules UnderstandingPackages.	**11Hours**
2.2	Powerful Lamda function in python, Programming using functions, modules and external packages	
2.3	Python String, List And Dictionary Manipulations: Building blocks of python programs Understanding string in build methods List manipulation using in build methods Dictionary manipulation	

UNIT III

3.1	**Python File Operation:** Reading config files in python Writing log files in python Understanding read functions, read(), readline() and readlines() Understandingwrite functions, write() and writelines() Manipulating file pointer using seek Programming using fileoperations	**11Hours**
3.2	**Exceptions Handling**: Standard Exceptions, Assertions in Python, What is Exception? Handling an Exception, The except Clause with No Exceptions ,The except Clause with Multiple Exceptions, The try-finally Clause, Argument of an Exception, Raising an Exception, User-Defined Exceptions	

Text Books:

 1. Python Programming : An Introduction to Computer Science by John Zelle

 2.Python Essential Reference by David M.Beazley

3.Learn Python the Hard Way by Zed A.Shaw

****

SEMESTER 1V
TITLE: Software Testing
Discipline specific elective (DSE3)
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Course Objectives: To study the fundamentals and principles of software testing. Employ correct testing terminology throughout the testing process. Execute specific software tests with well defined objectives and targets. Apply various testing techniques, including domain,code, fault, usage and model based. Execute program and test evaluations. Perform a complete testing process, taking into account practical considerations.

 Learning Outcome:

 To understand the significance of testing

To learn the essentials of testing

UNIT I   **INTRODUCTION TO SOFTWARE TESTING**

10 Hours

1.1   What is testing? Who does testing?Testing as an Engineering Activity . Role of Process in Software Quality . Testing as a Process . Software Testing Principles . The Tester.s Role in a Software Development Organization QA,QC and testing.

TYPES AND METHOD OF TESTING

1.2   Manual testing, automation testing, what to automate? When to automate?how to automate? Black box testing, white box testing, grey box testing. Comparison of testing methods.

LEVELS OF TESTING

UNIT II

11Hours

2.1   The Need for Levels of Testing . Unit Test . Unit Test Planning .Designing the Unit Tests. The Test Harness . Running the Unit tests and Recording results . Integration tests . Designing Integration Tests . Integration Test Planning . scenario testing . defect bash elimination -System Testing . types of systemtesting

2.2   - Acceptance testing . performance testing - Regression Testing . internationalization testing . ad-hoc testing - Alpha . Beta Tests . testing OO systems . usability and accessibility testing.

UNIT III   **TEST MANAGEMENT**

3.1   People and organizational issues in testing . organization structures for testing teams . testing services - Test Planning . Test Plan Components . Test Plan Attachments . Locating Test Items . test management . test process -

11Hours

3.2   Reporting Test Results . Introducing the test specialist . Skills needed by a test specialist .

REPORTING

Project, progress and productivity metrics. Status Meetings . Reports and Control Issues. Criteria for Test Completion . Types of reviews . Developing a review program . Components of Review Plans.

Reporting Review Results. Evaluating software quality

*****
BCA SEMESTER-IV
TITLE: Content Management System
Discipline specific elective (DSE4)
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Objective of Course: In this course the student will develop skills in appropriately organising the content of a website or an information product. This includes the creation and use of controlled vocabularies, taxonomies, labelling and categorisation with regard to:
Navigational support
Target group adapted information architecture

UNIT I

1.1
1.2
Introduction to CMS, online information management, advantages of CMS, Online information updating vs. CMS, logging in, dashboard, page list/search filter, common icons-light bulb, delete, edit this item, adding a new page, content editor

UNIT II

2.1
Paste, headings-heading styles, inserting a new image, uploading a new image, linkedlist,externallinks,linktoadocument,searcheng ines/optimization,search

10Hours

2.2
optimization details -file name, custom title, keywords,meta description.

UNIT III

12Hours

3.1
Menus, add new menu item- name, caption, parent sub menu, link, and modules, createanewmodule- moduletype,name,position,theme,configuremodule

3.2
settings-module title, details tab and light bulb, assign module toapage.

Text Books:
1. Content Management Bible 2nd edition, Bob Bioko.
2. Enterprise Content and Search Management for Building Digital Platforms, Wiley.

*****

BCA SEMESTER-V
Discipline specific elective(DSE 1)
TITLE: Mobile Technologies
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Objective of Course: Determine solutions using problem solving principles, logic and systematic methodologies.
Evaluate the architecture and principles of operation of computer systems and networks.
Synthesize principles and theories of computer science and software engineering for application to different computing paradigms.
Design and develop software systems for various application domains.

Course Outcome: Design and develop secure enterprise-grade information systems.
Manage the development of software systems through a variety of development processes and methodologies.
Design effective user interfaces using human computer interaction principles.
Synthesize new knowledge in the field of computer science by using appropriate research methodologies.

UNIT I	**GSM:** Introduction Architechture,Applications,Advantages and	**11 Hours**
1.1	disadvantages	
1.2	**GPRS**: GPRS – overview, GPRS – applications, GPRS – architecture, GPRS – protocol stack, GPRS – quality of service, GPRS – mobile station classes,GPRS	
1.3	PRS – data routing, GPRS – access modes & access point names, GPRS – network processes, GPRS – billing techniques, GPRS – mobile phones.	

UNIT II		
2.1	**CDMA** : CDMA ─ introduction, CDMA ─ channels, CDMA ─ multiple access methods, CDMA ─ fdma technology, CDMA ─ tdma technology,	**11Hours**
2.2	CDMA ─ technology, CDMA ─ network, CDMA ─ techniques, CDMA ─ spread spectrum	
2.3	,CDMA - fading, CDMA -near-far problem, CDMA -power control, CDMA - power control, CDMA -handoff, CDMA - interferences.	

UNIT III	**FTTH**	
3.1		**10Hours**
3.2	Introduction, Architechture,Applications,Advantages and disadvantages	
	5G:Introduction,Architechture,Applications,Advantages and disadvantages	

Text Books:
 1. Basic of code division multiple access by Raghuveer Rao and SohailDianath
 2. GPRS and 3G wireless Application by ChristofferAnderesson
 3. Wireless communication and networks. Second edition by William Stallings.

Links:
 1. https://www.insys-icom.com/icom/en/knowledge-base/cellular/gprs-basics
 2. https://www.tutorialspoint.com/gprs/gprs_pdf_version.htm
 3. https://www.tutorialspoint.com/cdma/index.htm
 4. https://books.google.co.in/books?id=H2OwaXe-wZ8C&pg=PR15&lpg=PR15&dq=cdma+textbooks&source=bl&ots=iAh-X6Pn_J&sig=LqXWipSgNqNsZqWG1wzaf-MOjkY&hl=en&sa=X&ved=0ahUKEwi3zq_Yu-HaAhWMuo8KHTldDecQ6AEIQjAE#v=onepage&q=cdma%20textbooks&f=false
 5. https://books.google.co.in/books?id=6QlPNB755YkC&printsec=frontcover&dq=gprs+books+and+authors&hl=en&sa=X&ved=0ahUKEwiP_tufv-HaAhWFTrwKHXnkBPgQ6AEIRTAF#v=onepage&q=gprs%20books%20and%20authors&f=false

Discipline specific elective ((DSE 2)
TITLE: Database Testing
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 =50

Course Objectives/Course Description:

This course introduces basic database concepts, objects which are available in a database, SQL queries and different types of database testing.

To study the fundamentals and principles of software testing

Learning Outcome:

- Define database,database objects, SQL commands

- Perform structural database testing, functional database testing

UNIT I		**11Hours**

Database concepts

1.1 What is DatabaseApplication? Testing the Application vs. Testing the DMBS Back End vs. Front End Testing. QA' ing Data – Who is responsible? What should be test in the Database? Knowledge required for the Database Tester Database Testing

1.2 Phases.

1.3 Database Testing Methodologies. Structural Database Testing. Functional Database Testing.

UNIT II   Basic SQL (Structured Query Language)

2.1 **SQL Basics :** Select, Insert, Update and Delete . Using the select Statement to Test data. Using the insert Statement to generate Test data .

11Hours

2.2 Testing for application accuracy using the Update and Delete Statements . Testing for basic data integrity usingConstraints.

UNIT III

3.1 **Testing with SQL**

3.2 Joining Tables, Using SQL Queries for DataVerification.Testing

10Hours

Database Objects: Views,   Indexes,   Stored procedures

Triggers,   User –Defined

3.3 Functions.

*****

BCA SEMESTER V
Discipline specific elective (DSE3)
TITLE: Network security
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Objectives of network security:
This **security** has four **objectives**: confidentiality, integrity, availability, and non repudiation (NR). Securing information is equivalent to ensuring that computers keep your secrets, hold valid information, are ready to work when you are, and keep records of your transactions.

Course Learning Outcomes:
Students will develop the ability to: Identify computer and **network security** threats, classify the threats and develop a **security** model to prevent, detect and recover from the attacks.

UNIT I **Network Security – Overview :**

1.1 Physical Network , Wired & Wireless Networks , Vulnerabilities & Attacks , Network Protocol , TCP/IP Protocol, DNS Protocol , Domain Name System (DNS) , DNS cache poisoning , ICMP Protocol , Goals of Network Security , Achieving Network Security , Security Mechanisms at Networking Layers . **12Hours**

1.2 **Application Layer Security:**
E-mail Security, E-mail Infrastructure , MIME , E-Mail Security Services, One- to-One E-mail , One-to-Multiple Recipients E-mail, PGP , S / MIME,

UNIT II **Security in Transport Layer:**

2.1 Need for Transport Layer Security , Why TLS is Popular, Secure Socket Layer (SSL), Brief History of SSL , Salient Features of SSL , Architect ,ure of SSL , Establishment of SSL Session , TLS Protocol , Salient Features , Comparison of TLS and SSL Protocols, **12Hours**

2.2 HTTPS, Use of HTTPS , Secure Shell Protocol (SSH) , SSH Services, Benefits & Limitations.

UNIT III **Network LayerSecurity**:

3.1 Security in Network Layer , Features of IPsec, Security Functions , Overview of IPsec, Operations Within IPsec , IPsec Communication Modes , IPsec Protocols , Encapsulation Security Protocol (ESP) , Security Administrative Databases. **10Hours**

3.2 **Data Link Layer Security**:
Security Concerns in Data Link Layer , Wireless LAN , Attacks in Wireless LAN , Security Measures in Wireless LAN , Network Access Control , User Authentication and Authorization , Firewalls , Types of Firewall , Difference between IDS and IPS.

3.3 Role of Network in Business , Necessity for Network Security , Importance of Network Security for Business

Text Books:
1.**Network Security Paperback – 2016 by Dr. Syed Jalal Ahmad (Author)**
Reference Books:
1. Network Security: The Complete Reference 1st Edition (English, soft cover, Roberta Bragg)

Discipline specific elective ((DSE 4)
TITLE: Cryptography
Class Duration : 16 Weeks with 2Hours a week = 48 Hrs
MARKS THEORY 30 + INTERNAL ASSESSMENT 20 = 50

Course Learning Objectives:
Students are expected to demonstrate the ability to:
1. Identify computer and network security threats, classify the threats and develop a security model to prevent, detect and recover from the attacks. (ABET Outcomes: a, c, e, j, k)
2. Encrypt and decrypt messages using block ciphers, sign and verify messages using well known signature generation and verification algorithms. (ABET Outcomes: c, e, k)
3. Analyze existing authentication and key agreement protocols, identify the weaknesses of these protocols. (ABET Outcomes: c, e, k)
4. Download and install an e-mail and file security software, PGP, and efficiently use the code to encrypt and sign messages. (ABET Outcomes: c, e, k)
5. Develop SSL or Firewall based solutions against security threats, employ access control techniques to the existing computer platforms such as Unix and Windows NT. (ABET Outcomes: a, c, e, i, k)
6. Write an extensive analysis report on any existing security product or code, investigate the strong and weak points of the product or code. (ABET Outcomes: a, e, i, j, k, h)

Learning Outcome: Learn about various encryption techniques. To understand the concept of Public key cryptography. To study about message authentication and hash functions To impart knowledge on Network security.

UNIT I 1.1	**Cryptography: Cryptography** Origin, history-hieroglyph, mono-alphabetic substitution cipher,caesar shift cipher, Steganography,evolution.	**10Hours**
1.2	**Modern CrMo Modern Cryptography:** Characteristics of modern cryptography, context of cryptography, cryptography, cryptanalysis	
UNIT II 2.1 2.2	**Security services of cryptography**- confidentiality, data integrity, authentication, non- repudiation, **cryptography primitives**- encryption, hash functions, message authentication codes and digitalsignatures	**11Hours**
UNIT III 3.1	**Cryptosystems:** Introduction,components of cryptosystem, types of cryptosystems,	**11Hours**
3.2	**symmetric key cryptosystem**, challenge of symmetric key cryptosystem,	
3.3	**asymmetric key cryptosystem**, challenges of publickeycryptosystem	

Text Books:
 1. Cryptography and Network Security: Principles and Practice, William Stalings.

2. Cryptography and Network Security, Behrouz A Forouzan.
3. Fundamentals of Cryptography: Volume II Basic Applications, OdedGoldreich

BLUE PRINT OF QUESTION PAPER FOR BCA COURSE– 2018 -19 Onwards
SEMESTERS I TO V

Time: 3 hours.   **Max Marks: 70**

PART-A		
Answer any TEN questions:		**10 x 2= 20 Marks**
1		2
2		2
3		2
4		2
5		2
6		2
7	*Note: Among 12 Questions, 4 Questions from each Unit*	2
8		2
9		2
10		2
11		2
12		2
PART-B		
Answer any FIVE questions:		**6 x 10 = 60 Marks**
13		10
14		10
15		10
16		10
17	*Note: Among 9 Questions, 3 Questions from each Unit, Question may have sub questions*	10
18		10
19		10
20		10
21		10

**BLUE PRINT OF QUESTION PAPER FOR BCA PRACTICAL EXAMINATION
SEMESTERS I TO V**

St. Philomena's College (Autonomous), Mysore			
Time: 3 Hours		**Max Marks: 70**	
PART-A			
Any One Experiment/Program From Each Part			
1.	a. Procedure development	Marks - 15	
	b. Implementation .	Marks - 05	**25**
	c. Result	Marks - 05	
2.	a. Procedure development	Marks - 20	
	b. Implementation .	Marks - 10	**35**
	c. Result	Marks - 05	
3.	a. Viva	Marks - 10	**10**
		Total	**70**