



**A. S. PATIL COLLEGE OF
COMMERCE (AUTONOMOUS),
VIJAYAPUR - 586103**



Bachelor of Computer Applications

Credit Based Choice System Syllabus

**Academic Year
2020-21**

**BCA Course Structure
From
I to II Semester**

I Semester BCA w.e.f 2020-21 and onwards CHOICE BASED CREDIT SYSTEM(CBCS)									
Part	Code	Subject Name	Teaching Hrs/week	Practical Hrs/week	Examination				Credits
					Duration Hrs	Marks			
						Theory /Practical	IA	Total	
AECC		Indian Constitution	2	-	2	40	10	50	2
CC	C1	Programming in C	4	-	3	70	30	100	4
	C2	Statistical Method	4	-	3	70	30	100	4
	C3	Digital Logic	4	-	3	70	30	100	4
		Lab-I: C programming	-	4	3	40	10	50	2
		Lab-II: Statistical Method	-	4	3	40	10	50	2
		Lab-III: Digital Logic	-	4	3	40	10	50	2
GE		Mathematics /Accountancy	4	-	3	70	30	100	4
		ECA	-	-	-	-	50	50	1
Total								650	25

I Semester			
<u>INDIAN CONSTITUTION</u>			
(Theory)			
Course Code	:		CIE Marks : 10
Credits: L:P:T	:	2:0:0	SEE Marks : 40
Total Hours	:	32 Hrs	SEE Duration : 2 Hrs
OBJECTIVE:			
<ul style="list-style-type: none"> • Constitution is the fundamental law of the land. • On the basis of it the national and individual life is going to be shaped. For this knowledge of Indian Constitution and its values is essential for students. 			
PEDAGOGY :			
Class Room Lecture, Assignments ,Tests, Seminars, Group Discussion ,Case Studies and Field Work.			
Unit-I			10 Hrs
Constitution – Structure and Principles			
<ol style="list-style-type: none"> 1. Meaning and importance of Constitution. 2. Making of Indian Constitution – Sources. 3. Salient features of Indian Constitution. 			
Unit-II			10 Hrs
Fundamental Rights and Directive Principles			
<ol style="list-style-type: none"> 1. Fundamental Rights. 2. Fundamental Duties. 3. Directive Principles. 			
Unit-III			12 Hrs
Government of Union			
<ol style="list-style-type: none"> 1. President of India – Election and Powers. 2. Prime Minister and Council of Ministers. 3. Lok Sabha – Composition and Powers. 4. Rajya Sabha – Composition and Powers. 			

Course Outcomes: After completing the course, the students will be able to	
CO1:	Understanding the meaning and importance of Constitution.
CO2:	Describe the Salient (Outstanding) features of Indian Constitution, Understanding the basic fundamental rights and duties.
CO3:	Describe the Directive principles of State policy. Understand the Union executives. The parliament members, leaders, election procedure etc.
Text Book	
1	Durga Das Basu, Introduction to the Constitution of India, Gurgaon; LexisNexis.
Reference Books	
1	M. V. Pylee, India's Constitution, New Delhi; S. Chand Pub.
2	J.N. Pandey, The Constitutional Law of India, Allahabad; Central Law Agency.
3	Constitution of India (Full Text), India. Gov. in., National Portal of India, https://www.india.gov.in/sites/upload_files/npi/files/coi_part_full.pdf .
4	Durga Das Basu, Bharatada Samvidhana Parichaya, Gurgaon; Lexis Nexis Butterworths Wadhawa.
5	Kb Merunandan, Bharatada Samvidhana Ondu Parichaya, Bangalore, MeraguPublications.

I Semester			
<u>PROGRAMMING IN C</u>			
(Theory)			
Course Code	:		CIE Marks : 30
Credits: L:P:T	:	4:0:0	SEE Marks : 70
Total Hours	:	52 Hrs	SEE Duration : 3 Hrs
OBJECTIVES:			
<ul style="list-style-type: none"> • To acquaint the students with concepts of Computer & Its Applications. • The objective of this course is to provide a comprehensive study of the C programming language, stressing upon the strengths of C, which provide the students with the means of writing modular, efficient, maintainable, and portable code. 			
PEDAGOGY :			
Class Room Lecture, Assignments ,Tests, Seminars, Group Discussion ,Case Studies and Field Work.			
Unit-I			10 Hrs
<p>Structure of C program: Algorithms & Flowchart, Header and body, Use of comments. Interpreters V/s compilers, Compilation of a program.</p> <p>Data: Variables, Constants, data types like: int, float char, double and void, short and long size qualifiers, signed and unsigned qualifiers. Compare static typing V/s dynamic typing in C.</p> <p>Variables: Declaring variables, scope of the variables according to block, hierarchy of data types. Compare explicit declarations & implicit declarations.</p> <p>Types of operators: Arithmetic, relational, logical, compound assignment, increment and decrement, conditional or ternary, bitwise and comma operators. Precedence and order of evaluation, statements and Expressions. Automatic and explicit type conversion.</p>			
Unit-II			11 Hrs
<p>Input and Output functions: Formatted I/O: printf(), scanf(), Character & String I/O format: getch(), getche(), getchar(), getc(), putchar(), putc(), gets(), puts().</p> <p>Iterations: Control statements for decision making: Branching: if statement, Nested if statement, switch statement. Looping: while loop, do..while, for loop. Jump statements: break, continue and goto.</p>			
Unit-III			8 Hrs
<p>Arrays: One and two dimensional arrays: declaring array variables, initialization of arrays, accessing array elements.</p> <p>Strings: Declaring and initializing String variables, Character and string handling functions.</p>			

Unit-IV		11 Hrs
<p>Functions: Function definition & declaration, Global and local variables, Calling a function, categories of functions, Recursive functions.</p> <p>Structure: Declaration of structure, reading and assignment of structure variables, Array of structures, arrays within structures, structures within structures.</p> <p>Unions: Defining and working with unions.</p>		
Unit-V		12 Hrs
<p>Pointer: Fundamentals, Pointer variables, Referencing and de-referencing, Pointer Arithmetic, Pointers with Arrays, Pointers with Strings, Array of Pointers, Pointers as function arguments, Functions returning pointers.</p>		
<p>Course Outcomes: After completing the course, the students will be able to</p>		
CO1:	Fundamental Concepts of C Programming & Problem solving techniques.	
CO2:	Development of Skills in Decision and Control Statements.	
CO3:	Acquiring skills on Arrays and Strings.	
CO4:	Acquiring skills on functions, recursion and structured data types, implementations.	
CO5:	Enhancing skills through pointers.	
Text Book		
1	E.Balaguruswamy : Programming in ANSI C" Tata Mc Graw-Hill.	
Reference Books		
1	Yashawant Kanetkar : "Let us C", BPB Publication.	
2	V.Rajaraman.: "Programming in C ", PHI (EEE) .	
3	Rajesh Hongal : "Computer Concepts & C language".	
4	Techniques through C. Pearson Education.	
5	Brian W. Kernighan, Dennis M. Rictchie," The C Programming Language", PHI Publication.	

I Semester				
<u>STATISTICAL METHOD</u>				
(Theory)				
Course Code	:		CIE Marks	: 30
Credits: L:P:T	:	2:0:0	SEE Marks	: 70
Total Hours	:	52Hrs	SEE Duration	: 3 Hrs
OBJECTIVES:				
<ul style="list-style-type: none"> • To acquaint the students with Mathematical concepts. • Implementing the mathematical model using Computer Applications. 				
PEDAGOGY :				
Class Room Lecture, Assignments ,Tests, Seminars, Group Discussion ,Case Studies and Field Work.				
Unit-I				10 Hrs
Introduction to Statistics: Basic Concepts and definition of Statistics, Definition of Central tendency, Measures of Central tendency- (Arithmetic Mean, Median, Mode, Geometric Mean, Harmonic Mean).				
Unit-II				10 Hrs
Variation: Definition of variation, various measures of variation like Range, Quartile Deviation(QD) , Mean Deviation(MD) , Standard Deviation(SD), Coefficient of variance, Coefficient of Mean Deviation, Coefficient of Range, Coefficient of Quartile Deviation.				
Unit-III				10 Hrs
Correlation and Regression: Introduction Types of Correlation, Measurement of Correlation, Definition of Regression, Properties of Regression Coefficient, Properties of Regression Lines.				

Unit-IV		12 Hrs
<p>Probability: Basic concepts and definition of probability, Random Experiment, Sample Space, Event, Complementary Event, Union of Events, Intersection of Events, Mutually Exclusive Events ,Mathematical Definition of Probability, Addition Theorem, Conditional Probability, Independent Events, Multiplication theorem and examples.</p>		
Unit-V		10 Hrs
<p>Random Variable: Introduction, Random Variable, Probability mass function, Probability distribution.</p>		
<p>Course Outcomes: After completing the course, the students will be able to</p>		
CO1:	Understanding Basics of Statistics and Calculate measures of central tendency.	
CO2:	Learning different types of Deviation & its Coefficient.	
CO3:	Understand regression and correlation analysis.	
CO4:	Discuss the different probability distributions & Acquire knowledge on sampling	
CO5:	Discuss the different sampling distributions.	
Text Book		
1	Raj Mohan , Business Statistics, Benaka Books, Karnataka	
Reference Books		
1	Y.P Agarwal:Statistical methods,Applications and Computations Sterling Pub. Pvt Ltd New Delhi	

I Semester			
<u>DIGITAL LOGIC</u>			
(Theory)			
Course Code	:		CIE Marks : 30
Credits: L:P:T	:	4:0:0	SEE Marks : 70
Total Hours	:	52 Hrs	SEE Duration : 3 Hrs
OBJECTIVES:			
<ul style="list-style-type: none"> • To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits. • Students are able to perform the analysis and design of various digital electronic circuits. 			
PEDAGOGY :			
Class Room Lecture, Assignments ,Tests, Seminars, Group Discussion ,Case Studies and Field Work.			
Unit-I			10 Hrs
Digital Systems and Binary Numbers: Digital Systems, Number systems and base conversions, Representation of signed Binary Numbers, Arithmetic addition and subtraction. Binary codes.			
Unit-II			10 Hrs
Concept of Boolean algebra: Basic Theorems and Properties of Boolean algebra, Boolean Functions, Canonical and Standard Forms, Minterms and Maxterms.			
Gate – Level Minimization: The Map method, Two, Three, Four Variable K-map's, Don't Care Conditions, NAND and NOR implementation, Exclusive OR function.			
Unit-III			10 Hrs
Combinational Logic: Combinational logic circuits, analysis and design procedure, Binary adder and subtractor, decimal adder, binary multiplier, Magnitude comparator, Decoders, Encoders, Multiplexers.			
Unit-IV			12 Hrs
Synchronous Sequential Logic: Sequential circuits, Latches, Flip Flops, SR, JK, T, D Flip Flops, Flip Flop excitation tables.			

Unit-V		10 Hrs
Registers and Counters: Registers, Shift registers, Ripple counters, Synchronous counters, Other counters.		
Course Outcomes: After completing the course, the students will be able to		
CO1:	Understanding Numbering System.	
CO2:	Learning of Basic fundamentals of Boolean Algebra.	
CO3:	Learning of Logic Gates & K-maps.	
CO4:	Study of Combinational Logic, Registers and Counters.	
CO5:	Learning of Storage Memory through circuit diagrams.	
Text Books		
1	M. M. Moris and Michael D. Ciletti, Digital Design, Pearson.	
Reference Books		
1	Paul Malvino, Digital Principles and Applications by Leach, Tata McGrawHill.	
2	Charles H.Roth, Fundamentals of Digital Logic Design, Cengage .	
3	G.K. Kharate, Digital Electronics, Oxford University Press .	
4	M. Moris Mano, Digital Logic and Computer Design, Pearson.	
5	V. Rajaraman, T. Radhakrishnan, An Introduction to Digital Computer Design, Prentice Hall.	

I Semester			
<u>MATHEMATICS</u>			
(Theory)			
Course Code	:		CIE Marks : 30
Credits: L:P:T	:	4:0:0	SEE Marks : 70
Total Hours	:	52 Hrs	SEE Duration : 3 Hrs
OBJECTIVES:			
<ul style="list-style-type: none"> • To acquaint the students with Mathematical concepts. • Become confident in using mathematics to analyse and solve problems both in school and in real-life situations. 			
PEDAGOGY :			
Class Room Lecture, Assignments ,Tests, Seminars, Group Discussion ,Case Studies and Field Work.			
Unit-I			12 Hrs
MATRICES: Symmetric, Skew-Symmetric, Orthogonal, Hermetian, Skew-Hermetian and Unitary matrices. Eigen values and Eigen-vectors, Cayley-Hamilton theorem (without proof) – verification Computation of inverse matrix using Cayley - Hamilton theorem.			
Unit-II			10 Hrs
AP, GP, HP, Principles of Mathematical Induction: Process of the proof by induction, motivating the application of the method by looking at natural numbers as the least inductive subset of real numbers. The principle of mathematical induction and simple problems based on summation only.			
Unit-III			10 Hrs
Permutations and Combinations with repetition, Binomial Theorem, Partial fractions.			
Unit-IV			10 Hrs
Percentage, Simple Interest & Compound Interest.			

Unit-V		10 Hrs
Measurements of angles, Trigonometric Functions: Sin, Cosine, Tangent, Cosecant, secant & Cotangent Angles, Trigonometrically ratio of certain standard angles, Allied Angles, Functions of Compound angles.		
Course Outcomes: After completing the course, the students will be able to		
CO1:	Diagonalize symmetric matrices and similar matrices and applying orthogonal transformation to determine Eigen values and Eigen vectors of a given matrix.	
CO2:	Applying the progression concepts and mathematical induction principles to find the solution given problem.	
CO3:	Analyzing the concept of a permutation and combination, Binomial Theorem and partial fractions.	
CO4:	Understanding and solving the percentages, Simple and compound interest of a given problem.	
CO5:	Studying of trigonometric functions, angles and their measurements.	
Text Books		
1	B.G.Umarani & Dr P.G.Umarani, Mathematics-I.	
Reference Books		
1	A text of trigonometry by S.Narayan, S.Vishwnath Calculus and analytical geometry G.B.Thomas and finney, pearson publication.	
2	S.S.Bosco, Mathematics-II, Boscoss Publications.	
3	Prof B.M.Sreenivasa Rao ,Mathematics-II, Excellent education.	

I Semester			
<u>ACCOUNTING & FINANCIAL MANAGEMENT</u>			
(Theory)			
Course Code	:		CIE Marks : 30
Credits: L:P:T	:	4:0:0	SEE Marks : 70
Total Hours	:	52 Hrs	SEE Duration : 3 Hrs
OBJECTIVES:			
<ul style="list-style-type: none"> • To acquaint students with Accounting Concepts. • To create awareness about the working of Partnership Firms. 			
PEDAGOGY :			
Class Room Lecture, Assignments ,Tests, Seminars, Group Discussion ,Case Studies and Field Work.			
Unit-I			13 Hrs
Introduction : History and Development of Accounting - Meaning, Objectives and functions of Accounting - Book - keeping V/s Accounting - Users of accounting data systems of book keeping and accounting - branches of accounting advantages and limitations of accounting.			
Unit-II			11 Hrs
Accounting Concepts and conventions: Meaning, need and classification, Accounting standards - meaning, need and classification of Indian accounting standards. Accounting principles V/s Accounting standards.			
Unit-III			10 Hrs
Financial Accounting Process : Classification of accounting transactions and accounts, rules of debit and credit as per Double Entry System. Journalisation and Ledger posting. Preparation of different subsidiary books: Purchase Day Book, Sales Day Book, Purchase Returns Day Book, Sales Returns Day Book and Cash Book.			

Unit-IV		10 Hrs
Bank Reconciliation Statement: Meaning, Causes for difference-Advantages - Preparation of Bank Reconciliation Statements.		
Preparation of Trial Balance: Rectification of errors and Journal Proper.		
Unit-V		8 Hrs
Preparation of Final Accounts: Meaning, need and classification, Preparation of Manufacturing, Trading, Profit and loss accounts and Balances - Sheet of sales- traders and partnership firms.		
Course Outcomes: After completing the course, the students will be able to		
CO1:	To Impart basic accounting knowledge as applicable to business.	
CO2:	Understanding the classifications of Accounts.	
CO3:	Familiarize students to Prepare the financial Accounting process.	
CO4:	To create bank Reconciliation statements & Trial balance.	
CO5:	Describe the main elements of financial accounting information – assets, liabilities, revenue and expenses.	
Text Book		
1	Prof M. B. Kadakol, Accounting, Renuka Publications.	
Reference Books		
1	V.A.-Patil & J.S.Korihalli, Book-Keeping and Accounting, R. Chand and Co. Delhi.	
2	R.S. Singhal, Principles of Accountancy, Nageen Prakash pvt. Ltd. Meerut.	
3	M.B. Kadkol, Book - Keeping and Accountancy, Renuka Prakashan, Hubli.	
4	Vithal,!. Sharma:..Accounting for Management, Macmillan publishers, Mumbai.	
5	B.S. Raman, Accountancy, United Publishers, Mangalore.	
6	Tulsian, Accounting & Financial Management - I: Financial Accounting–Pearson Education.	

I Semester

PROGRAMMING IN C

(Laboratory)

Course Code	:		CIE Marks	:	10
Credits: L:P:T	:	0:4:0	SEE Marks	:	40
Total Hours	:	04	SEE Duration	:	3 Hrs
1. Write C program to convert distance from km to meters, feet, inches, and, centimeters.					
2. Write C program to read a year as an input and find whether it is leap year or not. Also consider end of the centuries.					
3. Write a C Program takes three coefficients (a, b, and c) of a Quadratic equation ($ax^2+bx+c=0$) as input and compute all possible roots. The possible roots for a given set of coefficients with appropriate messages.					
4. Write a C program to generate n Fibonacci Series.					
5. Write a C program to calculate the following sum: Sum= $1-x^2/2!+x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$					
6. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.					
7. Write a C program to find both the largest and smallest number in a list of integers using 1-D array.					
8. Write a C program to perform the following: i) Addition of Two Matrices. ii) Multiplication of Two Matrices.					
9. Write C programs that use non-recursive functions to find the factorial of a given integer.					
10. Write C programs that use recursive function to find the GCD (greatest common divisor) of two given integers.					
11. Write a C program that uses functions to perform following operations: i) To insert a sub-string in to given main string from a given position.					

ii) To delete n Characters from a given position in a given string.	
12. Write a C- program to check if the given string is a palindrome or not.	
13. Write a C program to maintain a record of “n” student details using an array of structures with four fields (Roll number, Name, Marks, and Grade). Each field is of an appropriate data type. Print the marks of the student given student name as input.	
14. Write a C program using pointers to compute the sum, mean and standard deviation of all elements of n real numbers.	
Course Outcomes: After completing the course, the students will be able to	
CO1:	Understanding primitives, language principals and use them in writing simple programs.
CO2:	Understanding Working Of Ternary Operator.
CO3:	Development of multiple conditional logical programming with switch.
CO4:	Understanding the working of Iteration.
CO5:	Accomplishment of one dimensional and two dimensional Arrays.
CO6:	Understanding working of recursion and String Methods.

I Semester

STATISTICAL METHOD

(Laboratory)

Course Code	:		CIE Marks	:	10
Credits: L:P:T	:	0:4:0	SEE Marks	:	40
Total Hours	:	04	SEE Duration	:	3 Hrs

1. Write a Program to interchange the principle & secondary diagonal of a matrix.
2. Program to find sum of rows, columns, primary & secondary diagonals.
3. Write a Program to find Matrix is Singular or Not.
4. Write a Program to find addition and subtraction of two matrices.
5. Write a Program to find multiplication of two matrices
6. Write a Program to find whether the given matrix is identity or not.
7. Write a Program to find Arithmetic mean of n given number
8. Write a Program to find Geometric Mean and Harmonic Mean Of n given number.
9. Write a program to find mean and standard deviation.
10. Write a Program to Emulate N Dice Roller
11. Write a Program to find correlation between two variables
12. Write a Program to find Probability and Combinations
13. Calculate Range and Coefficient of Range for the n values.
14. Calculate Quartile and Coefficient of Quartile for the n values.

Course Outcomes: After completing the course, the students will be able to

CO1:	Learning of basics of Matrix.
CO2:	Understanding of Arithmetic Mean, Geometric Mean & Harmonic Mean
CO3:	Demonstration of Correlation
CO4:	Finding Probability & Combinations
CO5:	Able to know Range, Quartile and its Coefficients.

I Semester

DIGITAL LOGIC

(Laboratory)

Course Code	:		CIE Marks	:	10
Credits: L:P:T	:	0:4:0	SEE Marks	:	40
Total Hours	:	4	SEE Duration	:	3 Hrs

1. Study and verify the truth table of various logic gates · NOT, AND, OR, NAND, NOR, EX-OR, and EX-NOR.

2. For the following functions, construct a truth table and draw a circuit diagram.

a. $y(A,B) = (AB)' + B'$

b. $y(A,B,C) = (A + B)' C$

c. $y(A,B,C) = (AC)' + BC$

3. For the following functions, construct a truth table & draw a circuit diagram.

a) $y(A,B,C) = (A \oplus B)C'$

b) $y(A,B) = A' + B$

c) $y(A,B,C) = ((A+B)'(B+C))'$

4. Simplify Boolean expressions and realize it using universal gates.

5. Verification of Boolean Theorems using basic gates.

6. Design a 4-input NAND gate using two 2-input NAND gates and one 2-input NOR gate.
Hint: Use DeMorgan's law.

7. Construct the K-map for each of the following functions.

a) $f(A,B,C) = AB + A'BC' + AB'C$

b) $g(A,B,C) = A'C + ABC + AB'$

c) $h(A,B,C,D) = A'BC' + (A \oplus B)C + A'B'CD' + ABC$

8. For the functions listed below, construct a K-map and determine the minimal SOP expression.

$f(a,b,c) = a'b'c' + a'bc' + abc' + abc$ b. $g(a,b,c) = ab'c' + abc' + abc + \text{don't cares } (a'bc + ab'c)$ Build the circuit.

9. For the functions listed below, construct a K-map and determine the minimal POS expression.

a. $F(A,B,C) = \prod(0,3,6,7)$

b. $F(A,B,C,D) = \prod(3,5,7,8,10,11,12,13)$

10. Design and verify a half & full adder.

11. Design and verify half & full subtractor.

12. Design a 4 bit magnitude comparator using combinational circuits.

13. Design and verify the operation of flip-flops using logic gates.

14. Verify the operation of a 4 bit shift register.

Course Outcomes: After completing the course, the students will be able to:

CO1: Construction of circuit diagram.

CO2: Learning of Boolean expressions.

CO3: Construct & Design-map.

CO4: Designing of Adder circuits.

CO5: Learning of flip-flops , Counters and Registers.

II Semester BCA w.e.f 2020-21 and onwards CHOICE BASED CREDIT SYSTEM(CBCS)

Part	Code	Subject Name	Teaching Hrs/week	Practical hrs/week	Examination			Credits	
					Duration Hrs	Marks			
						Theory /Practical	IA		Total
AEC C		Environmental Studies	2	-	2	40	10	50	2
CC	C4	Data Structure using C	4	-	3	70	30	100	4
	C5	Operating System	4	-	3	70	30	100	4
	C6	Discrete Mathematics	4	-	3	70	30	100	4
		Lab-I:Data Structure using C	-	4	2	40	10	50	2
		Lab-II: Operating System	-	4	2	40	10	50	2
		Lab-III: Office Automation	-	4	2	40	10	50	2
GE		English/Hindi/Kannada	4	-	3	70	30	100	4
		ECA	-	-	-	-	50	50	1
Total								650	25

II Semester				
<u>ENVIRONMENTAL STUDIES</u>				
(Theory)				
Course Code	:		CIE Marks	: 10
Credits: L:P:T	:	2:0:0	SEE Marks	: 40
Total Hours	:	26 Hrs	SEE Duration	: 2 Hrs
OBJECTIVES:				
<ul style="list-style-type: none"> • Enhance the knowledge and Develop skills for protecting environmental studies. • To develop a world in which persons are aware of and concerned about environment and the problems associated with it, and committed to work individually as well as collectively towards solutions of current problems and prevention of future problems 				
PEDAGOGY :				
Class Room Lecture, Assignments ,Tests, Seminars, Group Discussion ,Case Studies and Field Work.				
Unit-I				13 Hrs
ECOSYSTEM, BIODIVERSITY AND NATURAL RESOURCES: Definition, Scope and basic principles of ecology and environment. Biological levels of organization population, community, ecosystem and biosphere. Ecosystem types: Terrestrial, aquatic and artificial. Organization of ecosystems: Biotic- Role of plants animals and microorganisms. abiotic components- Role of Water, light & temperature. Food chain and food web. Population and Community ecology- Population density, Natality, mortality, Growth curves - sigmoid growth curve. Community structure and species diversity-Diversity types and levels (alpha, beta and gamma). Study of western ghats as a Biodiversity hotspot.				
Unit-II				13 Hrs
ENVIRONMENTAL POLLUTION, GLOBAL ISSUES AND LEGISLATION: Causes, effects and control measures of air pollution, water pollution & soil pollution. Concept of Global warming, Eutrophication, carbon sequestration and carbon foot printing. Sustainable development & Ecological restoration. solid waste management, Water harvesting methods.				

Forest conservation act, biodiversity bill (2002), Wildlife Protection act 1972. Conservation Biology- Threats to Biodiversity, Wildlife trade. Renewable and non-renewable resources, Biodiversity Conservation -Insitu and Exsitu methods. Field visit to nearby Forest to study the Biodiversity. Field visit to Industrial area to study impact of pollution on the Biodiversity.	
Course Outcomes: After completing the course, the students will be able to	
CO1:	Familiarize multidisciplinary nature of environmental studies, Natural resources, eco-systems, pollution, issues.
CO2:	Acquaint students with biodiversity of India and its conservation.
CO3:	Enable students to be aware of the environment.
Text Book	
1	Krishnamurthy K V. An advanced text book of Biodiversity.
Reference Books	
1	Environmental Studies & Human Rights, Dr M.T Bandary, Dr B.Vasanth kumar.
2	H.O. Agarwal-Human Rights, Central Law Publications, Allahabad.
3	Durga Das Basu- Human Rights in Constitutional Law (Relevant Chapters).
4	Henkin Luise; Right of Man today, London: Steven,.

II Semester				
<u>DATA STRUCTURE USING C</u>				
(Theory)				
Course Code	:		CIE Marks	: 30
Credits: L:P:T	:	4:0:0	SEE Marks	: 70
Total Hours	:	52 Hrs	SEE Duration	: 3 Hrs
OBJECTIVES:				
<ul style="list-style-type: none"> • To acquaint the students with concepts of Data structure using C. • To enable students to apply skills in building computer applications. 				
PEDAGOGY :				
Class Room Lecture, Assignments ,Tests, Seminars, Group Discussion ,Case Studies and Field Work.				
Unit-I				10 Hrs
Introduction to Data structures: Definition, Classification of data structures: primitive and non-primitive, Operations on data structures.				
Dynamic memory allocation: Definition, Accessing the address of a variable. Meaning of static and dynamic memory allocation, Memory allocation functions: malloc, calloc, free and realloc.				
Unit-II				10 Hrs
Files - Introduction: Definition, Basic file operations: aiming a file, Opening a file, Reading a data from file, writing data to a file, and closing a file. Defining, Opening and closing a file. Input I Output operations on files: getc. pnc. getw, putw, fprintf, fscanf. Error handling during I/O operations: Common errors during I/O operations, feof, ferror Random Access to files: fseek, ftell, rewind functions.				
Unit-III				12 Hrs
Stack - Definition, Array representation of stack, Operations on stack: Applications of stacks, Infix, prefix and postfix notations Conversion of an arithmetic expression from Infix to postfix.				

Queue - Definition, Array representation of queue, Types of queue: Simple queue, circular queue, double ended queue (deque) priority queue, operations on all types of Queues.	
Unit-IV	
10 Hrs	
Searching and Sorting Technique:- Basic Search Techniques: sequential search, Binary search -Iterative and Recursive methods. Difference between sequential and binary search. Sort-Definition Different types of sorting techniques: Bubble sort ,Selection sort, Merge sort, Insertion sort, Quick sort.	
Unit-V	
10 Hrs	
Linked list - Definition, Components of linked list, Representation of linked list, Advantages and Disadvantages of linked list. Types of linked list: Singly linked list, Doubly linked list, Circular linked list and circular doubly linked list. Operations on singly linked list: creation, insertion, deletion, search and display.	
Course Outcomes: After completing the course, the students will be able to	
CO1:	Understand the Basic Concept of Data Structure and Dynamic memory management.
CO2:	Understanding of pointers and getting familiar with opening, writing, creating and closing a file.
CO3:	Acquiring Knowledge On stack, Queue and its applications.
CO4:	Learning and implementing Various Searching & Sorting Techniques.
CO5:	Understanding and implementation of Linked List
Text Book	
1	Kamthane: Introduction to Data Structures in C. Pearson Education.
Reference Books	
1	Langsam, Ausenstein Maoshe & M. Tanenbaum Aaron Data Structures using C and C++ Pearson Education.
2	A.M. Padma Reddy, Data Structure using C, Shree Nandi publications.
3	Weiss, Data Structures and Algorithm Analysis in C, Pearson Education.
4	Lipschutz: Schaum's outline series Data structures Tata McGraw.

5	Robert Kruse Data Structures and program designing using 'C'.
4	Trembley and Sorenson Data Structures.

II Semester			
<u>OPERATING SYSTEM</u>			
(Theory)			
Course Code	:		CIE Marks : 30
Credits: L:P:T	:	4:0:0	SEE Marks : 70
Total Hours	:	52 Hrs	SEE Duration : 3 Hrs
OBJECTIVES:			
<ul style="list-style-type: none"> • To acquaint the students with basic structure, process management, scheduling and deadlock. • To acquaint the students with memory management and file system, secondary storage structure and protection. 			
PEDAGOGY :			
Class Room Lecture, Assignments ,Tests, Seminars, Group Discussion ,Case Studies and Field Work.			
Unit-I			12 Hrs
INTRODUCTION: What operating systems do; Computer System organization; Computer System architecture; Operating System structure; Distributed system; Computing environments. Operating System Services; User - Operating System interface; Virtual Machine; Operating System design and implementation.			
PROCESS MANAGEMENT: Process concept; Process scheduling; Operations on processes; Inter-process communication; Multithreading models.			
Unit-II			10 Hrs
PROCESS SCHEDULING: Basic concepts; Scheduling criteria; Scheduling algorithms; Multiple-Processor scheduling; Thread scheduling.			
PROCESS SYNCHRONIZATION: Synchronization: The Critical section problem; Synchronization hardware; Semaphores; Classical problems of synchronization; Monitors.			
Unit-III			12 Hrs
DEADLOCKS: System model; Deadlock characterization; Deadlock prevention; Deadlock avoidance; Deadlock detection and recovery from deadlock.			

MEMORY MANAGEMENT: Logical and Physical address space; Swapping; Contiguous memory allocation; Paging; Segmentation. Virtual Memory Management: Demand paging & its performance Page replacement; Allocation of frames; Thrashing.	
Unit-IV	
10 Hrs	
FILE SYSTEM: File concept; Access methods; Directory structure; Protection. Implementing File System: File system structure; Directory implementation; Allocation methods; Free space management.	
SECONDARY STORAGE STRUCTURES: Disk structure; Disk attachment; Disk scheduling; Disk management; Swap space management.	
Unit-V	
08 Hrs	
Protection: Goals of protection, Domain of protection. Introduction to Unix and Unix commands. Introduction of sed, awk and grep family.	
Course Outcomes: After completing the course, the students will be able to	
CO1:	Learning the Basic concepts of operating system, system structures and Process management.
CO2:	Solving problems on various scheduling algorithms & Process synchronization.
CO3:	Studying the concepts on deadlocks and memory management.
CO4:	Knowing the Concepts of file management and Solving problems on Disk management.
CO5:	Learning the system protection and basic concepts of UNIX and its commands.
Text Book	
1	Operating System Principles - Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Wiley-India.
Reference Books	
1	Operating Systems: A Concept Based Approach - D.M.
2	Dhamdhare, Tata McGraw- Hill.
3	Operating Systems - P.C.P. Bhatt, PHI.
4	Operating Systems - Harvey M Deital, Addison Wesley.

II-Semester			
<u>DISCRETE MATHEMATICAL STRUCTURES</u>			
(Theory)			
Course Code	:		CIE Marks : 30
Credits: L:P:T	:	4:0:0	SEE Marks : 70
Total Hours	:	52 Hrs	SEE Duration : 3 Hrs
OBJECTIVES:			
<ul style="list-style-type: none"> • To develop logical thinking and its application to computer science and apply logical reasoning to solve a variety of problems. • The subject enhances one's ability to reason and ability to present a coherent and mathematically accurate argument, Use mathematically correct terminology and notation. 			
PEDAGOGY :			
Class Room Lecture, Assignments ,Tests, Seminars, Group Discussion ,Case Studies and Field Work.			
Unit-I			08 Hrs
Fundamentals of Logic Basic connectivity and Truth table, Logical equivalence, logical implications, Quantifiers – Definitions and Proofs of theorem.			
Unit-II			12 Hrs
Set Theory: Sets and subsets, Set operations and the laws of set theory, Principle of inclusion and exclusion and Venn Diagrams, Generalization of principle of inclusion and exclusion.			
Unit-III			10 Hrs
Functions: Functions-types of functions, Special Functions, Function composition and Inverse function.			
Unit-IV			10 Hrs
Relations: Cartesian Product and relations, Properties of Relations, Zero-one matrices and directed graphs, Hasse diagram, Equivalence relations and partitions.			

Unit-V		12 Hrs
Graph: Theory Definitions and Examples, Sub graphs , complements and Graph Isomorphism, Vertex Degree, Planar Graphs, Hamiltonian paths and circuits, Matrix representation-Incidence matrix and Adjacency matrix.		
Course Outcomes: After completing the course, the students will be able to:		
CO1:	Knowing the argument using logical notations and determining the argument is valid or not.	
CO2:	Understanding the basics principles of sets and operations.	
CO3:	Determining the different types of functions.	
CO4:	Demonstrate and understanding of relation is able to determine their properties.	
CO5:	Demonstrate different model problems using Hamilton path and matrix representations.	
Text Book		
1	Discrete and Combinatorial Mathematics. An applied Introduction, Ralph P Grimaldi, B.V.Ramana, Pearson Education, ISBN-10:8177584243, ISBN-13:9788177584240.	
Reference Books		
1	Discrete Mathematics, Seymour Lipschutz, Marc Lipson, Schaum's Outlines, McGraw-Hill, ISBN: 978-0-161587-7.	
2	Discrete Mathematics & its Applications, Kenneth H Rosen, McGraw-Hill, ISBN10: 0073383090, ISBN-13: 978-0-073383095. Geir Agnarsson & Raymond Greenlaw, "Graph Theory-Modeling, Applications and Algorithms", Pearson Education, ISBN - 978-81-317-1728-8.	

II Semester

ENGLISH

(Theory)

Course Code	:		CIE Marks	:	30
Credits: L:P:T	:	4:0:0	SEE Marks	:	70
Total Hours	:	52 Hrs	SEE Duration	:	3 Hrs

OBJECTIVES:

- To inculcate life skills and human values.
- To improve the reading and writing skills and language competency.

PEDAGOGY :

Class Room Lecture, Assignments ,Tests, Seminars, Group Discussion ,Case Studies and Field Work.

Unit-I

14 Hrs

Prose:

1. The Last Leaf - O Henry.
2. The Challenge of Everest – H. P. S. Ahluwalia.
3. Zero Budget Natural Farming – Shibu.
4. The Kid – Charlie Chaplin.

Unit-II

14 Hrs

Poetry:

1. A Prayer for My Daughter – W. B. Yeats.
2. The Road Not Taken – Robert Frost.
3. Still I Rise - Maya Angelou.
4. How did you Die? - Edmund Vance Cooke.

Unit-III		24 Hrs
<u>Language Activity:</u>		
<ol style="list-style-type: none"> 1. Word class (Nouns, Adjectives, Verbs, adverbs). 2. Articles. 3. Prepositions (Place, Time, and Position). 4. Synonyms. 5. Antonyms. 6. Introducing: Self Introduction and Introducing the chief-guest /principal/president/family member/relatives/friend. 		
Course Outcomes: After completing the course, the students will be able to:		
CO1:	Read, understand, and interpret a variety of written texts.	
CO2:	Undertake guided and extended writing using appropriate vocabulary.	
CO3:	Understanding and correcting grammar usage	
CO4:	Listen and speak with confidence in both formal and informal contexts with reasonable fluency and acceptable pronunciation.	
CO5:	Become employable with requisite professional skills, ethics and values.	
Text Book		
1	Contemporary English grammar structure and composition.	

II Semester				
<u>HINDI</u>				
(Theory)				
Course Code	:		CIE Marks	: 30
Credits: L:P:T	:	4:0:0	SEE Marks	: 70
Total Hours	:	52 Hrs	SEE Duration	: 3 Hrs
OBJECTIVES:				
<ul style="list-style-type: none"> • To actively involve students in the meaning & knowledge construction of the language using the constructivist teaching approach. • To enable students practically apply concepts learnt in class by means of content having a real life connect. 				
1. गद्य ज्योति – सं. डॉ.रामकिशोर वर्मा. 2. पत्र लेखन (वाणिज्य पत्र). 3. अनुवाद (कन्नडा/अंग्रेजी अनुच्छेद का हिन्दी में अनुवाद). प्रात्यक्षिक:कथाकारिता,शब्दों का योग्य उच्चारण, शब्दों का अनुवाद.				52 Hrs
Course Outcomes: After completing the course, the students will be able to				
CO1:	Develop Hindi reading & linguistic comprehension of students.			
CO2:	Develop interest in literature story and poetry.			
CO3:	Inculcate moral and human values within themselves.			
CO4:	Understand the types of Hindi Short Story Writing.			
CO5:	Develop Reading, Writing & Communication skills			
Text Book				
1	गद्य ज्योति – सं. डॉ.रामकिशोर वर्मा, ज्योति प्रकाशन इलाहाबाद -१.			
Reference Books				
1	व्यवहिक हिन्दी: रामकिशोर वर्मा.			
II Semester				

KANNADA

(Theory)

Course Code	:		CIE Marks	:	30
Credits: L:P:T	:	4:0:0	SEE Marks	:	70
Total Hours	:	52 Hrs	SEE Duration	:	3 Hrs

OBJECTIVES:

- To impart education for new generation that acquaints them with our culture.
- To impart all forms of Kannada literature to student to help to learn dynamic attitude.

ಸಾಹಿತ್ಯ - 1

ಸಾಹಿತ್ಯ - MAZÄÄ

32 Hrs

1. ಪಾಠಶಾಲೆಗೆ ಹಾಜರಿರಿಸುವುದು - ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು (ಸಾಹಿತ್ಯ: ರ. ಜಿ. ಜಿ)

2. ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು - ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು

3. ದುಃಖ - ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು

4. ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು - ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು

5. ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು - ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು

6. ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು - ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು

7. ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು - ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು

ಸಾಹಿತ್ಯ - JgÄqÄÄ

20 Hrs

ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು (ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು) - ಸಾಹಿತ್ಯದ ಮೂಲಭೂತ ಅಂಶಗಳು

Course Outcomes: After completing the course, the students will be able to

CO1:	To impart and motivate them to learn the State Language with easeness and confidence enabling for better communication skills.
CO2:	To orient , enhance the knowledge of the language basics & vachanas.
CO3:	To train the students effectively in learning process of Kannada language.
CO4:	To enable the learners with the history, evolution.

II Semester

DATA STRUCTURE USING C

(Laboratory)

Course Code	:		CIE Marks	:	10
Credits: L:P:T	:	0:4:0	SEE Marks	:	40
Total Hours	:	04	SEE Duration	:	3 Hrs
1. Write a C Program to find the Binomial co-efficient using recursion					
2. Program to find X^n using recursion.					
3. Program to search for an element using sequential (linear) search.					
4. Program to search for an element in an array using binary search.					
5. Program to Sort a list of N elements using Bubble Sort.					
6. Program to sort a list of N elements using MERGE SORT Algorithm.					
7. Write a program to sort N numbers using selection sort.					
8. Program to sort a list of N elements using insertion sort.					
9. Program to demonstrate stack using push, pop, display.					
10. Program to simulate working of circular queue, the operations are q insert a. Q delete, Q display					
11. program to simulate working of Ordinary queue, the operations are q insert b. Q delete, Q display					
12. Program to convert and print a given valid fully parenthized infix arithmetic expression to postfix expression. The consists of single character as operands and +,-,*, / as operators, assume that only binary operators are allowed in the expression.					
13. Write a program to Count Number of Characters, Words & Sentences using File Concept.					
14. Write a C Program to Open a File, Write in it and Close the File.					
Course Outcomes: After completing the course, the students will be able to					
CO1:	Implementing recursion algorithm concept in Binomial Co-efficient.				
CO2:	Implementation of searching and sorting techniques.				
CO3:	Simulating the operations on Stack and Queues-Circular & Ordinary.				
CO4:	Demonstration Of convert the infix to postfix expression.				
CO5:	Implementation of Files.				
<u>II Semester</u>					
<u>OPERATING SYSTEM</u>					
(Laboratory)					

Course Code	:		CIE Marks	:	10
Credits: L:P:T	:	0:4:0	SEE Marks	:	40
Total Hours	:	04	SEE Duration	:	3 Hrs
1. Write a C program to simulate the FCFS non-preemptive CPU scheduling algorithms to find turnaround time and waiting time.					
2. Write a C program to simulate the SJF non-preemptive CPU scheduling algorithms to find turnaround time and waiting time.					
3. Write a C program to simulate the Round Robin (pre-emptive) non-preemptive CPU scheduling algorithms to find turnaround time and waiting time.					
4. Write a C program to simulate the Priority non-preemptive CPU scheduling algorithms to find turnaround time and waiting time.					
5. Write a C program to simulate the Sequential file allocation strategies.					
6. Write a C program to simulate the following file allocation strategies. a) Indexed b) Linked					
7. Write a C program to simulate the following contiguous memory allocation techniques a) Worst-fit b) Best-fit					
8. Write a C program to simulate paging technique of memory management.					
9. Write a C program to simulate Bankers algorithm for the purpose of deadlock avoidance.					
10. Write a C program to simulate disk scheduling algorithms a) FCFS b) SCAN					
11. Write a C program to simulate FIFO page replacement algorithms.					
12. Write a C program to simulate LRU page replacement algorithms.					
13. Write a C program to simulate producer-consumer problem using semaphores.					
14. Write a C program to simulate the concept of Dining-Philosophers problem.					
Course Outcomes: After completing the course, the students will be able to					
CO1:	Recognize CPU Scheduling, synchronization, and deadlock.				
CO2:	Develop various system programs to make use of OS concepts related to process synchronization, shared memory, file systems and Deadlock, etc.				
CO3:	Apply segmentation and paging techniques.				
CO4:	Implementation of semaphore.				
II- Semester					
<u>OFFICE AUTOMATION</u>					

(Laboratory)

Course Code	:		CIE Marks	:	10
Credits: L:P:T	:	0:4:0	SEE Marks	:	40
Total Hours	:	04	SEE Duration	:	3 Hrs

1. Creating Paragraphs Inserting Date & Time, Pictures, Bullets & Numbering, indentation etc. in MS-Word.

2. Create Visiting card Using MS-Word.

3. **Mail Merge:** Create a form letter with common matter and empty spaces for text which will change for each letter (fields). Format and save the letter with a new name. Create another document containing a table with rows and columns. The row headings should be fieldnames and each subsequent row should containing data under each field name to be used in the form letter (empty spaces) saved previously. Save this document with a different name. Perform Mail Merge with both the saved files.

4. Create and Run Macros in MS Word.

5. Create a PowerPoint presentation on BLDE Association (5 Slides).

6. Create a PowerPoint presentation apply the different design themes, transitions and animations.

7. Create a new workbook and explore the usage of the following groups of inbuilt functions.

a) TEXT- Concatenate, Dollar, Clean, Trim, Find, Replace, Left, Right, Mid.

b) Date & Time – Date, Date Value, Day, Month, Year, Days, Now, Hour, Minute, Second, Time, Today.

c) Lookup & Reference – Row, Column, Rows, Columns, Match.

8. Create a new workbook and explore the usage of the following groups of inbuilt functions
Math & Trigonometric – Cos, Sin, Tan, Ceiling, Floor, Decimal, Even, GCD, int, LCM, Log, Round, Roundup, Rounddown, Sqrt, Sum.

a) Statistical – Average, Count, CountBlank, Countif, Mean, Stddev.

b) Info – iseven, isodd, isformula, istext.

9. Create a payroll for an BLDE Organization in MS-Excel with chart representation.

10. Create a student's marks sheet in MS-Excel with chart representation.

11. Create dropdown list for products with its price.	
12. Create a spreadsheet on product invoice apply V-Lookup and H-Lookup.	
13. <u>Graphs and Charts:</u> Create a new workbook. Feed appropriate tabular data and create column graphs and pie charts using the data. Format the charts for color, data, numbers, legend, axis, effects and 3d options.	
14. <u>Group, Sort, Filter:</u> Create a new workbook and feed data in a category wise manner (eg. Individual product's monthly sales figures of different categories of products for a six month period) and group, ungroup, subtotal, sort and filter data according to categories. Also do the same using Advanced filter.	
Course Outcomes: After completing the course, the students will be able to	
CO1:	Able to do Various Formatting in MS-Word.
CO2:	Able to apply knowledge in Creating Mail Merge and to run Macros in MS-Word.
CO3:	Able to do Various Formatting in MS-Powerpoint to create the slides.
CO4:	Applying various calculating functions and formulae and creating Different Charts Using MS-Excel.