DEPARTMENT OF COMPUTER APPLICATIONS

VISION

- To Be Renewed Potential Academic Excellence toward Betterment of Society.

MISSION

- To Develop Students with Innovative Ideas, Talent, Problem-Solving Abilities, and Leadership Qualities.
- To Establish Industrial interaction in Order to improve Entrepreneurship Skills.
- To Train Students with the Latest Trends, Tools, and Technologies.
- To Promote Knowledge for holistic development in Social Events and Ethics.

PROGRAMME OUTCOMES

After completion of the programme, the student will be able to

PO1 acquires knowledge of Computing Fundamentals, Basic Mathematics, Computing specialization, and Domain Knowledge of proper computing models from defined problems

PO2 analysis and synthesizes computing systems through quantitative and qualitative techniques.

PO3 modern tool usage for Design and Development - Able to analyse and identify the customer requirements in multidisciplinary domains, create high level design and implement robust software applications using the latest technological skills.

PO4 capable of adapting to new technologies and constantly upgrading their skills with an attitude towards independent and lifelong learning.

PO5 communicates effectively in both verbal and written form.

PO6 perform professionally with social, cultural and ethical responsibility as an individual as well as in multifaceted teams with a positive attitude.

PO7 develop practical skills that will allow you to provide solutions to industry, society, and business.

PROGRAMME EDUCATIONAL OBJECTIVES

The objectives of this programme are to equip/prepare the students as

PEO1 graduates are prepared for employment in the IT industry by demonstrating the required domain knowledge. (50%)

PEO2 graduates are motivated to become global leaders through practical training, hands-on and project experience, and career and entrepreneurial skill development. (30%)

PEO3 graduates are addressed and trained to be creative, to develop innovative ideas about social issues, and to be directed toward problems with solutions. (20%)

PROGRAMME SPECIFIC OUTCOMES (PSOS)

A graduate with B.C.A. in the Computer Application program will

PSO1 prepare students for roles that require them to develop programming skills, networking skills, learning applications, programming languages, Web development, hardware and troubleshooting, software skills, and modern techniques related to computer applications and the IT industry.

PSO2 develop your knowledge and skills not only in computers and real-world application software but also in common organizations and management.

PSO3 give a number of opportunities for individuals to shine in their lives and a few of them, like software programmers, system developers, network administrators, web designers, and faculty for Computer Science and Computer Applications.

GRADUATE ATTRIBUTES

1) **Disciplinary knowledge:** Ability to apply mathematics, logic, and statistics to the design, development, and analysis of software systems to the knowledge of the discipline to develop and update domain knowledge relevant to choose the IT Industry.

2) **Critical thinking:** Demonstrate Computer Applications used industry /enterprise/ community by conveying ideas clearly, effectively and professionally to the satisfaction of all the stakeholders for the quality manner.

3) **Analytical reasoning**: Ability to design components, systems and/or processes to meet required specifications in Computer Application.

4) **Information/digital literacy:** Apply latest technology competently and appropriately as and when required to apply relevant problem-solving methodologies for lifelong solutions.

5) **Communication Skills:** Ability to communicates effectively, comprehending and writing effective reports and design documentation, summarizing information, making effective oral presentations and giving and receiving clear oral instructions and demonstrate English proficiency in the industry/company to meet the communication skills.

6) **Leadership readiness/qualities:** Ability to develop creative and effective responses to intellectual, professional and social challenge and to be open-minded about cultural diversity, linguistic difference, and the complex nature of our world in the positive manner.

7) **Self-directed learning:** Ability to demonstrate competence in the practical art of computing in by showing in design, an understanding of the practical methods, and using modern design tools competently for complex real-life IT problem.

PROGRAMME STRUCTURE FOR BCA

(For those admitted from the Academic year 2023-2024 and onwards)

Category	Course Type	Course Code	Course Title	Contact Hours	Exam Hours	Marks			Credits
						CIA	ESE	Total Marks	
Semester-I									
PART-I	Language	U23TA1L1	Tamil– I	6	3	25	75	100	3
PART-II	English	U23EN1L1	English – I	6	3	25	75	100	3
PART-III	Core-1	U23CA101	Python Programming	5	3	25	75	100	5
	Core-2 (Core Lab-1)	U23CA1P1	Practical: Python Programming Lab	5	3	40	60	100	5
	Elective Generic -1 (Allied)	U23CA1A1	RDBMS with PL/SQL	4	3	25	75	100	3
PART-IV	Skill Enhancement Course SEC1 (NME – 1)	U23CA1S1	Fundamentals of Information Technology	2	-	50	-	50	2
	Foundation Course	U23CAFC1	Structured programming in C	2	-	50	-	50	2
TOTAL				**30**				**600**	**23**
Semester-II									
PART-I	Language	U23TA2L2	Tamil– II	6	3	25	75	100	3
PART-II	English	U23EN2L2	English – II	6	3	25	75	100	3
PART-III	Core-3	U23CA202	Object Oriented Programming Concepts using C++	5	3	25	75	100	5
	Core-4 (Core Lab-2)	U23CA2P2	Practical: C++ Programming Lab	5	3	40	60	100	5
	Elective Generic2- (Allied Lab)	U23CA2AP	PL/SQL LAB	4	3	40	60	100	3
	Comprehension – I (Self Study Course-Online Exam)	U23CA2C1	Comprehension in Computer Applications – I	-	1	-	50	50	1
PART-IV	Skill Enhancement Courses SEC2 (NME – 2)	U23CA2S2	Introduction to HTML	2	-	50	-	50	2
	Skill Enhancement Course SEC3 (DSC)	U23CA2S3	Office Automation	2	2	-	50	50	2
TOTAL				**30**				**650**	**24**

Semester-III									
PART-I	Language	U23TA3L3	Tamil– III	6	3	25	75	100	3
PART-II	English	U23EN3L3	English – III	6	3	25	75	100	3
PART-III	Core-05	U23CA303	Data Structures and Algorithms	5	3	25	75	100	5
	Core-06 (Core Lab 3)	U23CA3P3	Data Structures and Algorithms – Lab	5	3	40	60	100	5
	Elective Generic -3(Allied)	U23CA3A3	Discrete Mathematics	4	3	25	75	100	3
PART-IV	Skill Enhancement Course SEC4 (DSC)	U23CA3SP	Entrepreneurial Based - Web Designing Lab	2	-	50	-	50	2
	Ability Enhancement Compulsory Course -1	U23AE301	Environmental Studies	2	-	50	-	50	2
TOTAL				**30**				**600**	**23**
Semester-IV									
PART-I	Language	U23TA4L4	Tamil– IV	6	3	25	75	100	3
PART-II	English	U23EN4L4	English– IV	6	3	25	75	100	3
PART-III	Core-07	U23CA404	Programming in Java	4	3	25	75	100	4
	Core-08 (Core Lab – 4)	U23CA4P4	Programming in Java - Lab	4	3	40	60	100	4
	Elective Generic -4 (Allied)	U23CA4A4	Digital Logic Fundamentals	4	3	25	75	100	3
	Comprehension – II (Self Study Course- Online Exam)	U23CA4C2	Comprehension in Computer Applications–II	-	1	-	50	50	1
PART-IV	Skill Enhancement Course SEC5 (DSC)	U23CA4S4	PHP Programming	2	2	-	50	50	2
	Skill Enhancement Course SEC6 (DSC)	U23CA4SP	PHP Programming – Lab	2	2	-	50	50	2
	Ability Enhancement Course	U23AE402	Yoga & Value Education	2	-	50	-	50	2
	Internship/ Institutional Training/Mini Project/ (Carried out during II year summer vacation-2 weeks duration)	U23CA5IT	Internship/ Institutional Training /Mini Project	-	-	Completion			
TOTAL				**30**				**700**	**24**

PART-III

Semester-V									
PART-III	Core-09	U23CA505	Operating system	5	3	25	75	100	4
	Core-10	U23CA506	ASP.Net programming	5	3	25	75	100	4
	Core-11 (Core Lab- 5)	U23CA5P5	ASP.Net programming – Lab	5	3	40	60	100	4
	Core Elective -1	U23CA5E1A	**Software Engineering**	4	3	25	75	100	3
		U23CA5E1B	Cryptography						
		U23CA5E1C	Information Security						
	Core Elective -2	U23CA5E2A	**Artificial Intelligence**	4	3	25	75	100	3
		U23CA5E2B	Big Data Analytics						
		U23CA5E2C	Mobile Adhoc Network						
	Core-12 Major Group Project	U23CA5MP	Major Group Project with Viva Voce	5	3	40	60	100	5
PART-IV	Skill Enhancement Course SEC7 (DSC)	U23CA5SP	Open-Source Software Technologies - Linux Lab	2	2	-	50	50	2
	Proficiency Enhancement Course (Self-Study Course)	U23GS5SS	General Studies	-	-	-	Completion		2
	Summer Internship/ Institutional Training / Mini Project	U23CA5IT	Internship/ Institutional Training /Mini Project	-	-	40	60	100	2
	MOOC/Spoken Tutorial (Self Study Course - online)			-	-	-	Completion		2
TOTAL				**30**				**750**	**31**
Semester-VI									
PART-III	Core-13	U23CA607	Computer Network	5	3	25	75	100	3
	Core-14	U23CA608	Data analytic using R Programming	5	3	25	75	100	3
	Core – 15	U23CA609	Introduction to Data Science	5	3	25	75	100	3
	Core – 16 (Core Lab 6)	U23CA6P6	R Programming Lab	5	3	40	60	100	3
	Core Elective-3	U23CA6E3A	**Mobile Application Development**	4	3	25	75	100	3

PART		Code	Title						
		U23CA6E3B	Grid Computing						
		U23CA6E3C	Artificial Neural Network						
	Core Elective-4	U23CA6E4A	**Cloud Computing**	4	3	25	75	100	3
		U23CA6E4B	Fuzzy Logic						
		U23CA6E4C	Human Computer Interaction						
	Comprehension – III (Self Study Course- Online Exam)	U23CA6C3	Comprehension in Computer Applications – III	-	1	-	50	50	1
PART-IV	Professional Competence Skill Enhancement Course (SEC8)	U23CAPC1	IOT and Its Applications	2	2	-	50	50	2
	Extra Department Course Open Elective – (Self Study Course)	To be selected from the courses offered by other departments		-	3	-	100	100	3
PART-V	Extension Activities – NSS, NCC, YRC, Physical Education			-	-	-	Completion		1
	NCC*								
TOTAL				**30**				**800**	**25**
Grand Total				**180**					**150**

*As per UGC norms, those students who opt NCC under extension activities will be studying the prescribed syllabi of the UGC which will include theory, practical and camp components such students who qualify the prescribed requirements will earn in additional **24 credits**.

Part-III BCA / Semester – III / Core-5:
DATA STRUCTURES AND ALGORITHMS (U23CA303)

Lecture Hours	: 60	**Tutorial Hours**	: 15
Practical Hours	: -	**No. of Credits**	: 05
Contact Hours per Semester	: 75		
Contact hours per Week	: 5		
Internal Marks	: 25		
External Marks	: 75		
Total Marks	: 100		

Objectives of the Course

The course aims at giving an overall view of the
- To understand the concepts of Data structures list
- To learn linear data structures-lists, stacks, queues
- To learn Tree structures and application of trees
- To learn graph structures and application of graphs
- To understand various sorting and searching

Course Learning Outcomes (for Mapping with POs and PSOs)
On completion of the course, the students will be able to

CO1 understand the concept of Dynamic memory management, data types, algorithms, Big O notation

CO2 understand basic data structures such as arrays, linked lists, stacks and queues

CO3 describe the hash function and concepts of collision and its resolution methods

CO4 solve problem involving graphs, trees and heaps

CO5 apply Algorithm for solving problems like sorting, searching, insertion and deletion of data

CO-PO and PSO Mapping (Course Articulation Matrix)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	2	2	3	3	3	3	3	3	3
CO2	3	2	2	2	2	3	2	3	3	3
CO3	3	2	3	3	2	2	2	3	3	3
CO4	2	2	2	2	2	3	2	3	3	3
CO5	3	2	2	2	3	3	3	3	3	2
Total Contribution of COs to POs and PSOs	14	10	11	12	12	14	12	15	15	14
Weighted percentage of Course Contribution to POs	93.33	66.67	73.33	80.00	80.00	93.33	80.00	100	100	93.33

0- No Correlation   1-Weak   2-Moderate   3-Strong

Course Content

Unit 1 Abstract Data Type   (L-12hrs; T-3hrs)

Abstract Data Types (ADTs)- List ADT-array-based implementation-linked list implementation singly linked lists-circular linked lists-doubly-linked lists-applications of lists-Polynomial Manipulation- All Operations-Insertion-Deletion

Unit 2 Stack and Queue   (L-12hrs; T-3hrs)

Stack ADT-Operations- Applications- Evaluating arithmetic expressions – Conversion of infix to postfix expression-Queue ADT-Operations-Circular Queue- Priority Queue- dequeue applications of queues.

Unit 3 Tree Concept   (L-12hrs; T-3hrs)

Tree ADT-tree traversals-Binary Tree ADT-expression trees-applications of trees-binary search tree ADT- Heap-Applications.

Unit 4 Graphs   (L-12hrs; T-3hrs)

Definition- Representation of Graph- Types of graph-Breadth first search – Depth first search-Topological sort- Bi-connectivity – Cut vertex- Euler Circuits-Applications of graphs.

Unit 5 Sorting and Hashing   (L-12hrs; T-3hrs)

Searching- Linear Search-Binary Search-Sorting-Bubble Sort-Selection Sort-Insertion sort-Shell Sort-Radix Sort-Hashing-Hash functions- -Rehashing Extendible Hashing.

Recommended Texts

1. Mark Allen Weiss, *Data Structures and Algorithm Analysis in C++*, 4th Edition, Pearson Education, 2014.
2. Reema Thareja, *Data Structures Using C*, 2nd Edition, Oxford Universities Press, 2014.

Reference Books

1. Thomas H. Cormen, Chales E. Leiserson, Ronald Rivest, Clifford Stein, Introduction to Algorithms, McGraw Hill 2009, 3rd Edition.

2. Aho, Hopcroft and Ullman, Data Structures and Algorithms, Pearson Education ,2003

Website and E-learning sources

1. NPTEL & MOOC courses titled Data Structures

2. https://nptel.ac.in/courses/106106127/

Part-III BCA / Semester – III / Core Lab-3:
DATA STRUCTURES AND ALGORITHMS - LAB (U23CA3P3)

Lecture Hours	: -	**Tutorial Hour :**	-
Practical Hours	: 75	**No. of Credits :**	05
Contact Hours per Semester	: 75		
Contact hours per Week	: 5		
Internal Marks	: 40		
External Marks	: 60		
Total Marks	: 100		

Objectives of the Course

This course aims at providing knowledge on
- To understand the concepts of ADTs
- To learn linear data structures-lists, stacks, queues
- To learn Tree structures and application of trees
- To learn graph structures and application of graphs
- To understand various sorting and searching

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students would be able to:

CO1 understand the concept of Dynamic memory management, data types, algorithms, Big O notation

CO2 understand basic data structures such as arrays, linked lists, stacks and queues

CO3 describe the hash function and concepts of collision and its resolution methods

CO4 solve problem involving graphs, trees and heaps

CO5 apply Algorithm for solving problems like sorting, searching, insertion and deletion of data

CO-PO and PSO Mapping (Course Articulation Matrix)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	2	3	2	3	3	3	3
CO2	2	1	3	3	2	2	2	3	3	3
CO3	3	3	1	2	1	3	2	3	3	3
CO4	2	3	3	1	2	1	2	3	3	3
CO5	3	2	3	2	3	2	2	3	3	2
Total Contribution of COs to POs and PSOs	12	11	12	10	11	10	11	15	15	14
Weighted percentage of Course Contribution to POs	80.00	73.33	80.00	66.67	73.33	66.67	73.33	100	100	93.33

0- No Correlation   1-Weak   2-Moderate   3-Strong

LIST OF DATA STRUCTURES AND ALGORITHMS LAB

PART-A

Instructions:

The following list of programs are compulsory and must be completed during the current semester and submitted in a record form.

PROGRAMS

1. Write a program to implement the List ADT using arrays and linked lists.
2. Write a program to implement the following using a singly linked list.
   - Stack ADT
   - Queue ADT
3. Write a program that reads an infix expression, converts the expression to postfix form and then evaluates the postfix expression (use stack ADT).
4. Write a program to implement priority queue ADT.
5. Write a program to perform the following operations:
   - Insert an element into a binary search tree.
   - Delete an element from a binary search tree.
   - Search for a key element in a binary search tree.
6. Write a program for the implementation of BFS and DFS for a given graph.
7. Write a program for implementing the following searching methods:
   - Linear search
   - Binary search.
8. Write a program for implementing the following sorting methods:
   - Bubble sort
   - Selection sort
   - Insertion sort
   - Radix sort.

PART-B
MINI PROJECT

Instructions:

- The following list of projects are compulsory and must be completed and submitted as a printed record.

- A team of 5 to 6 members will be followed as a group. They have to select any 3 given topics by using C, C++ and Python.

I. Snakes and Ladder Game

Snakes and Ladder is the most common board game played. The rules of the game are as follows:
The first person to reach 100 wins.
Each player gets only one chance in a single traversing.
Snakes decrease your points while the ladder increases them.

II. Library Management System

The library is the place where we find a collection of books organized in a particular order. The functionality of the Library Management System is mentioned below:

1) Add book information.
2) Display book information.
3) To list all books of a given author.
4) To list the count of books in the library

III. Hangman Game

The hangman game is one of the most famous games played on computers. The Rules of the game are as follows:
1) There is given a word with omitted characters and you need to guess the characters to win the game.
2) Only 3 chances are available and if you win the Man survives or Man gets hanged.

IV. Bus Reservation System

Bus Reservation is a real-time job any person relatable getting the tension to book tickets offline is just resolved using this.
The functionality of the Bus reservation system is mentioned below:
1) Login System
2) Booking of tickets
3) Cancel tickets
4) Checking bus status

V. Cricket Score Board

Cricket second most popular game in the world. Most Indians are just crazy about these sports
The functionality of the Cricket score display is mentioned below:
1) Print Match Statistics
2) Print runs scored
3) Update score
4) Show results

Scheme of Evaluation

CIA – 40
PART-A – 30 [Result-5, Writing Program-5, Execution-5, Output-10, Viva-5]
PART-B – 10 [Report-5, Viva-5]
ESE – 60
PART-A – 40 [Result-15, Writing Program-5, Execution-5, Output-10, Viva-5]
PART-B – 20 [Report-10, Viva-10]

Recommended Texts

1. Mark Allen Weiss, *"Data Structures and Algorithm Analysis in C++"*, 4th Edition, Pearson Education 2014.
2. Reema Thareja, *"Data Structures Using C"*, 2nd Edition, Oxford Universities Press 2014.

Reference Books

1. Thomas H. Cormen, Chales E. Leiserson, Ronald Rivest, Clifford Stein, "Introduction to Algorithms", McGraw Hill 2009, 3rd Edition.

2. Aho, Hopcroft and Ullman, "Data Structures and Algorithms", Pearson Education 2003

Website and E-learning sources

1. NPTEL & MOOC courses titled Data Structures
2. https://nptel.ac.in/courses/106106127/

Part-III BCA / Semester – III / Elective Generic-3: DISCRETE MATHEMATICS(U23CA3A3)

Lecture Hours	: 50	**Tutorial Hours**	: 10
Practical Hours	: -	**No. of Credits**	: 03
Contact Hours per Semester	: 60		
Contact hours per Week	: 4		
Internal Marks	: 25		
External Marks	: 75		
Total Marks	: 100		

Objectives of the Course

This course aims at providing an overall view of the

- Discrete Mathematics introduces students to the mathematics of networks, social choice, and decision making.
- The course provides students with a hands-on exploration of the relevancy of math in the real world.
- Applications and modelling are central to this course of study
- Appropriate technology should be used regularly for instruction and assessment
- Discrete Mathematics reflects the rigor taught in many entry-level college math courses.

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students will be able to:

CO1 **s**tudents are able to use mathematical reasoning in order to read, comprehend, and construct mathematical arguments.

CO2 demonstrate an understanding of relations and functions and be able to determine their properties.

CO3 students will count or enumerate objects and perform combinatorial analysis.

CO4 students will verify whether an algorithm works well and perform analysis in terms of memory and time.

CO5 students will formulate and model problems with the concepts and techniques of discrete mathematics.

CO-PO and PSO Mapping (Course Articulation Matrix)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	2	3	2	3	3	3	3
CO2	2	1	3	3	2	2	2	3	3	3
CO3	3	3	1	2	1	3	2	3	3	3
CO4	2	3	3	1	2	1	2	3	3	3
CO5	3	2	3	2	3	2	2	3	3	2
Total Contribution of COs to POs and PSOs	12	11	12	10	11	10	11	15	15	14
Weighted percentage of Course Contribution to POs	80.00	73.33	80.00	66.67	73.33	66.67	73.33	100	100	93.33

0- No Correlation   **1-Weak**   **2-Moderate**   **3-Strong**

Course Content

Unit 1 Relations   (L-10hrs; T-2 hrs)

Introduction to Relation -Binary Relation – Classification of Relations Composition of Relations – Inverse of a Relations – Representation of Relations on a set.

Unit 2 Functions   (L-10hrs; T-2 hrs)

Introduction to Functions–Addition and Multiplication of Functions–Classifications of Functions–Composition of Function–Inverse function.

Unit 3 Mathematical Logic   (L-10hrs; T-2 hrs)

Introduction – Statement (Propositions) – Basic set of Logical Operators/Operations – Propositions and Truth Tables – Algebra of Propositions.

Unit 4 Matrix Algebra   (L-10hrs; T-2 hrs)

Definition of a Matrix – Types of Matrices – Operations on Matrices -Addition, Subtraction, Scalar Multiple and Multiplication of Matrices Related Matrices-Transpose of a Matrix.

Unit 5 Graph Theory   (L-10hrs; T-2 hrs)

Graphs and Basic terminologies–Types of Graphs–Subgraph–Operations on graphs - Representation of Graph.

Recommended Texts

1. Swapan Kumar Chakraborty, Bikash Kanti Sarkar *Discrete Mathematics*, Oxford University Press
2. Hall, C., & O'Donnell J. (2000) *Discrete Mathematics Using a Computer*, Springer Verlag
3. K. A. Ross and C. R. B. Wright, *Discrete Mathematics* (Fifth Edition), Prentice Hall, 2003

Reference Books

1. Seymour Lipchitz and Marc Lars Lipson, *Discrete Mathematics*, Tata McGraw Hill Education Private Limited, Third Edition.

2. J.P. Tremblay, R. Manohar by *Discrete Mathematical Structures with Applications to Computer Science* TMH edition

Website and E-learning sources

1. http://home.iitk.ac.in/~arlal/book/mth202.pdf

2. https://www.tutorialspoint.com/discrete_mathematics/discrete_mathematicpdf_version.htm

3. http://www.freebookcentre.net/Mathematics/Discrete-Mathematics-Books.html

4. https://www.coursera.org/specializations/discrete-mathematics

Part-IV BCA / Semester – III / SEC-4- ENTREPRENEURIAL BASED - WEB DESIGNING - LAB (U23CA3SP)

Lecture Hours	**: -**	**Tutorial Hours : -**	
Practical Hours	**: 2**	**No. of Credits : 02**	
Contact Hours per Semester : 30			
Contact hours per Week	**: 2**		
Internal Marks	**: 50**		
External Marks	**: -**		
Total Marks	**: 50**		

Objectives of the Course

This course aims at providing an overall view of the
- Understand the basics of HTML and its components
- To study about the tables and list in HTML
- Understand and apply the concepts of XML and CSS
- Understand the concept of JavaScript

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students would be able to:

CO1 develop working knowledge of HTML
CO2 ability to Develop and publish Webpages using Hypertext Markup Language (HTML).
CO3 ability to optimize page styles and layout with Cascading Style Sheets (CSS).
CO4 ability to develop a JavaScript
CO5 an ability to develop web application using various web programming languages.

CO-PO and PSO Mapping (Course Articulation Matrix)

CO-PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	2	3	2	3	3	3	3
CO2	2	1	3	3	2	2	2	3	3	3
CO3	3	3	1	2	1	3	2	3	3	3
CO4	2	3	3	1	2	1	2	3	3	3
CO5	3	2	3	2	3	2	2	3	3	2
Total Contribution of COs to POs and PSOs	12	11	12	10	11	10	11	15	15	14
Weighted percentage of Course Contribution to POs	80.00	73.33	80.00	66.67	73.33	66.67	73.33	100	100	93.33

0- No Correlation   1-Weak   2-Moderate   3-Strong

LIST OF WEB DESIGNING LAB

1. Create a HTML file to apply colours in different ways.

2. Create a static web page which defines all text formatting tags of HTML in tabular format.

3. Create webpage to include image using HTML tag.

4. Design an HTML page to create an ordered and unordered list of items and tags to provide link to different pages.

5. Design an HTML page that contains different frames in a single window.

6. Create employee registration webpage using HTML form objects.

7. Design a webpage using different font styles and background properties in CSS.

8. Design a webpage using CSS properties for positioning an element

9. Write JavaScript code for Performing arithmetic operations

10. Write JavaScript code for checking if the number is odd or even.

11. Write JavaScript code for calculating factorial of a number.

12. Create an XML file with Internal / External DTD

Recommended Texts

1. Pankaj Sharma, ‒*Web Technology*, SK Kataria &Sons Bangalore,2011.
2. Mike Mc graph, ‒*JavaScript, Dream Tech*,1ˢᵗEdition, Press,2006.
3. Achyut S Godbole & Atul Kahate, ‒*Web Technologies*, 2ⁿᵈEdition, 2002.

Reference Books

1. Laura Lemay, Rafe Colburn, Jennifer Kyrnin, ‒*Mastering HTML, CSS & Java Script* Web Publishing,2016.

2. DT Editorial Services (Author), ‒*HTML5BlackBook* (CoversCSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery), 2ndEdition Paperback, 2016.

Website and E-learning sources

1. NPTEL&MOOC courses titled Web Design and Development.

2. https://www.geeksforgeeks.org

Part-IV BCA / Semester – III / Ability Enhancement – ENVIRONMENTAL STUDIES (U23AE301)

Lecture Hours	: 2	Tutorial Hours	: -
Practical Hours	: -	No. of Credits	: 02
Contact Hours per Semester	: 30		
Contact hours per Week	: 2		
Internal Marks	: 50		
External Marks	: -		
Total Marks	: 50		

Objective of the Course

The course is designed to provide students knowledge about the basic concepts, components and importance of the environment.

Course Outcomes

On completion of the course the students will be able to:

CO1 define the structure and functions of ecosystem

CO2 explain the benefits of biodiversity conservation

CO3 summarize the sources, effects and control measures of various types of Pollution

CO4 perceive the environment legislations in India for sustainable development.

CO5 evaluate appropriate techniques, resources, and modern instruments and equipment's to control the pollutants

Course Content

Unit 1 Ecology and Ecosystem   (L-6hrs)

Definition and Scope of Environmental Studies – Ecology and Ecosystem – Structure of an Ecosystem – Food chains, food webs and ecological pyramids.

Unit 2 Environmental problems and Management   (L-6hrs)

Environmental problems and Management: Causes, effects and Control measures of: Air Pollution – Water Pollution – Noise Pollution – Nuclear Hazards. Solid waste management and Waste Disposal methods.

Unit 3 Biodiversity and its conservation   (L-6hrs)

Biodiversity and its conservation: Introduction-definition, Types of diversity: genetic, species and ecosystem biodiversity. Value of biodiversity: Consumptive use, productive use, social, ethical and aesthetic values. Biodiversity at global, national and local levels.

Unit 4 Threats to biodiversity   (L-6hrs)

India as a mega diversity nation, Hot spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit 5 Climate change and Global Warming   (L-6hrs)

Climate change and Global Warming causes and Measures. Waste and Plastics. Urban environmental problems and measures. Disaster management: floods, earthquake, cyclone and landslides.

Recommended Texts

1. P.D.Sharma ,*Ecology and Environment*, Rastogi Publication 2003.

2. N. Arumugam and V. Kumaresan *Environmental Studies*,..Saras Publication.

Reference Books

1. Agarwal. K.C. *Environmental Biology,* Nidi Publications Limited, Bikaner 2001.

2. Wiley Eastern, Environmental *Chemistry* Limited India A.K.De. 1999.

3. Jadhav,H. and Bhosale, *Environmental Protection and Laws*, V.M.1995.,Himalaya Publishing House, Delhi. pp284.

4. Odum, Fundamentals of Ecology, E.P.1971. W.B.Saunders Co., USA.pp.574.

Website and E-learning sources

1. Biodiversity: https://www.pmfias.com/biodiversity-hotspots-india/

2. https://byjus.com/free-ias-prep/biodiversity/

3. Pollution; https://www.livescience.com/22728-pollution-facts.html

4. https://sciencing.com/types-pollutants-5270696.html

5. WildlifeProtectionAct:https://www.indiacode.nic.in/handle/123456789/1726?view_type=browse&sam_handle=123456789/1362

6. https://byjus.com/free-ias-prep/wildlife-protection-act-1972/

Part-III BCA / Semester – IV / Core-7:
PROGRAMMING IN JAVA (U23CA404)

Lecture Hours	: 50	**Tutorial Hours**	: 10
Practical Hours	: -	**No. of Credits**	: 04
Contact Hours per Semester	: 60		
Contact hours per Week	: 4		
Internal Marks	: 25		
External Marks	: 75		
Total Marks	: 100		

Objectives of the Course
The course aims at giving an overall view of the

- To provide fundamental knowledge of object-oriented programming
- To equip the student with programming knowledge in Core Java from the basics up.
- To enable the students to use AWT controls, Event Handling and Swing for GUI.
- To provide fundamental knowledge of object-oriented programming.
- To equip the student with programming knowledge in Core Java from the basics up.

Course Learning Outcomes (for Mapping with POs and PSOs)
On completion of the course the students will be able to

CO1 understand the basic Object-oriented concepts. Implement the basic constructs of Core Java.

CO2 implement inheritance, packages, interfaces and exception handling of Core Java.

CO3 implement multi-threading and I/O Streams of Core Java

CO4 implement AWT and Event handling.

CO5 use Swing to create GUI.

CO-PO and PSO Mapping (Course Articulation Matrix)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	3	3	3	2	3	1	2	3	3	3
CO2	3	2	2	2	3	2	3	3	3	3
CO3	2	3	3	2	2	3	2	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	2	2	2	2	2	1	1	3	3	2
Total Contribution of COs to POs and PSOs	13	13	13	11	13	10	11	15	15	14
Weighted percentage of Course Contribution to POs	86.66	86.66	86.66	73.33	86.66	66.67	73.33	100	100	93.33

0- No Correlation   1-Weak   2-Moderate   3-Strong

Course Content

Unit 1 Basics of Java   (L-10hrs; T-2hrs)

Introduction: Review of Object-Oriented concepts – History of Java – Java buzz words – JVM architecture - Datatypes - Variables - Scope and life time of variables - arrays - operators – control statements - type conversion and casting - simple java program - constructors - methods - Static block - Static Data – Static Method String and String Buffer Classes.

Unit 2 Inheritance and Exception Handling   (L-10hrs; T-2hrs)

Inheritance: Basic concepts - Types of inheritance - Member access rules - Usage of this and Super key word - Method Overloading - Method overriding - Abstract classes - Dynamic method dispatch - Usage of final keyword.

Packages: Definition-Access Protection -Importing Packages.

Interfaces: Definition–Implementation–Extending Interfaces.

Exception Handling: try – catch - throw - throws – finally – Built-in exceptions - Creating own Exception classes.

Unit 3 Thread and I/O Stream   (L-10hrs; T-2hrs)

Multithreaded Programming: Thread Class - Runnable interface –Synchronization–Using synchronized methods– Using synchronized statement- Interthread Communication –Deadlock.

I/O Streams: Concepts of streams - Stream classes- Byte and Character stream - Reading console Input and Writing Console output - File Handling.

Unit 4 AWT Controls and Event Handling   (L-10hrs; T-2hrs)

AWT Controls: The AWT class hierarchy - user interface components- Labels - Button - Text Components - Check Box - Check Box Group - Choice - List Box - Panels – Scroll Pane - Menu - Scroll Bar. Working with Frame class - Color - Fonts and layout managers.

Event Handling: Events - Event sources - Event Listeners - Event Delegation Model (EDM) - Handling Mouse and Keyboard Events - Adapter classes - Inner classes

Unit- 5 J-Swing   (L-10hrs; T-2hrs)

Swing: Introduction to Swing - Hierarchy of swing components. Containers - Top level containers - JFrame - JWindow - JDialog - JPanel - JButton - JToggleButton - JCheckBox - JRadioButton - JLabel,JTextField - JTextArea - JList - JComboBox - JScrollPane.

Recommended Texts

1. Herbert Schildt, *The Complete Reference*, Tata McGraw Hill, New Delhi, 7th Edition, 2010
2. Gary Cornell, *Core Java 2 Volume I – Fundamentals,* Addison Wesley, 1999

Reference Books

1. O'Rielly *Head First Java* Publications,
2. Y. Daniel Liang, *Introduction to Java Programming*, 7th Edition, Pearson Education India, 2010

Website and e-learning source

1. https://javabeginnerstutorial.com/core-java-tutorial
2. http://docs.oracle.com/javase/tutorial/
3. https://www.coursera.org/

Part-III BCA / Semester – IV / Core Lab-4:
PROGRAMMING IN JAVA – LAB (U23CA4P4)

Lecture Hours	: -	**Tutorial Hours :** -	
Practical Hours	: 60	**No. of Credits : 04**	
Contact Hours per Semester	: 60		
Contact hours per Week	: 4		
Internal Marks	: 40		
External Marks	: 60		
Total Marks	: 100		

Objectives of the Course

This course aims at providing knowledge on
- To provide fundamental knowledge of object-oriented programming
- To equip the student with programming knowledge in Core Java from the basics up.
- To enable the students to know about Event Handling.
- To enable the students to use String Concepts.
- To equip the student with programming knowledge in to create GUI using AWT controls.

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students will be able to

CO1 understand the basic Object-oriented concepts. Implement the basic constructs of Core Java.
CO2 implement inheritance, packages, interfaces and exception handling of Core Java.
CO3 implement multi-threading and I/O Streams of Core Java
CO4 implement AWT and Event handling.
CO5 use Swing to create GUI.

CO-PO and PSO Mapping (Course Articulation Matrix)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	2	3	2	3	3	3	3
CO2	2	1	3	3	2	2	2	3	3	3
CO3	3	3	1	2	1	3	2	3	3	3
CO4	2	3	3	1	2	1	2	3	3	3
CO5	3	2	3	2	3	2	2	3	3	2
Total Contribution of COs to POs and PSOs	12	11	12	10	11	10	11	15	15	14
Weighted percentage of Course Contribution to POs	80.00	73.33	80.00	66.67	73.33	66.67	73.33	100	100	93.33

0- No Correlation   1-Weak   2-Moderate   3-Strong

LIST OF JAVA PROGRAMMING LAB

1. Write a Java program that prompts the user for an integer and then prints out all the prime numbers up to that Integer?

2. Write a Java program to multiply two given matrices.

3. Write a Java program that displays the number of characters, lines and words in a text?

4. Generate random numbers between two given limits using Random class and print messages according to the range of the value generated.

5. Write a program to do String Manipulation using Character Array and perform the following string operations:
   - String length
   - Finding a character at a particular position
   - Concatenating two strings

6. Write a program to perform the following string operations using String class:
   - String Concatenation
   - Search a substring
   - To extract substring from given string

7. Write a program to perform string operations using String Buffer class:

   - Length of a string
   - Reverse a string
   - Delete a substring from the given string

8. Write a java program that implements a multi-thread application that has three threads. First thread generates random integer every 1 second and if the value is even, second thread computes the square of the number and prints. If the value is odd, the third thread will print the value of cube of the number.

9. Write a threading program which uses the same method asynchronously to print the numbers 1to10 using Thread1 and to print 90 to100 using Thread2.

10. Write a program to demonstrate the use of following exceptions.

    - Arithmetic Exception
    - Number Format Exception
    - Array Index Out of Bound Exception
    - Negative Array Size Exception

11. Write a Java program that reads on file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes?

12. Write a program to accept a text and change its size and font. Include bold italic options. Use frames and controls.

13. Write a Java program that handles all mouse events and shows the event name at the center of the window when a mouse event is fired. (Use adapter classes).

14. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result. Handle any possible exceptions like divide by zero.

15. Write a Java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green with radio buttons. On selecting a button, an appropriate message with "stop" or "ready" or "go" should appear above the buttons in a selected color. Initially there is no message shown.

Recommended Texts

1. Herbert Schildt, *The Complete Reference*, Tata McGraw Hill, New Delhi, 7th Edition, 2010

2. Gary Cornell, *Core Java 2 Volume I – Fundamentals,* Addison Wesley, 1999

Reference Books

1. , O'Rielly ,*Head First Java* Publications,

2. Y. Daniel Liang, *Introduction to Java Programming*, 7th Edition, Pearson Education India, 2010

Website and E-learning sources

1. https://javabeginnerstutorial.com/core-java-tutorial

2. http://docs.oracle.com/javase/tutorial/

3. https://www.coursera.org/

Part-III BCA / Semester – IV / Elective Generic -4:

DIGITAL LOGIC FUNDAMENTALS (U23CA4A4)

Lecture Hours	**: 50**	**Tutorial Hours**	**: 10**
Practical Hours	**: -**	**No. of Credit**	**: 03**
Contact Hours per Semester	**: 60**		
Contact hours per Week	**: 4**		
Internal Marks	**: 25**		
External Marks	**: 75**		
Total Marks	**: 100**		

Objectives of the Course

This course aims at providing knowledge on

- This course provides basic knowledge about all Boolean Functions and circuits
- Also, course takes effort to understand design synchronous & asynchronous circuits and Programmable Logic Devices.

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students will be able to

CO1 design digital circuits using simplified Boolean functions

CO2 to analyze and design combinational circuits.

CO3 to analyze and design synchronous and asynchronous sequential circuits.

CO4 to understand Programmable Logic Devices.

CO5 to write HDL code for combinational and sequential circuits

CO-PO and PSO Mapping (Course Articulation Matrix)

CO-PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	2	3	2	3	3	3	3
CO2	2	1	3	3	2	2	2	3	3	3
CO3	3	3	1	2	1	3	2	3	3	3
CO4	2	3	3	1	2	1	2	3	3	3
CO5	3	2	3	2	3	2	2	3	3	2
Total Contribution of COs to POs and PSOs	12	11	12	10	11	10	11	15	15	14
Weighted percentage of Course Contribution to Pos	80.00	73.33	80.00	66.67	73.33	66.67	73.33	100	100	93.33

0- No Correlation   1-Weak   2-Moderate   3-Strong

Course Content

Unit 1 Logic Gates   (L-10hrs; T-2hrs)

Digital Logic - The Basic gates-NOT, OR, AND; Universal Logic gates - NOR, NAND. Combinational Logic Circuits - Boolean Laws and Theorems.

Unit 2 Sum of Product and K-Map   (L-10hrs; T-2hrs)

Sum-of-Products method - Truth table to Karnaugh Map - Pairs, Quads and Octets; Karnaugh Simplifications- Don't care Conditions

Unit 3 Product of Sum and Conversion   (L-10hrs; T-2hrs)

Product-of-sums Method - Product-of-sums simplification - Number Systems and Codes - Binary Number system - Binary-to-decimal Conversion - Decimal-to-Binary Conversion.

Unit 4 Number System   (L-10hrs; T-2hrs)

Octal Numbers - Hexadecimal Numbers - Arithmetic Circuits – Binary Addition - Binary Subtraction.

Unit 5 2's Complement   (L-10hrs; T-2hrs)

2'S complement representation - Arithmetic Building Blocks - Adder– Subtractor.

Recommended Texts

1. Donald P Leach, Albert Paul Malvino, Goutam Saha, *Digital Principles and Applications*, McGraw Hill Education Pvt. Ltd, 7th Edition, 2013.
2. M. Morris R. Mano, Michael D. Ciletti, —*Digital Design: With an Introduction to the Verilog HDL,* VHDL, and System Verilog, 6th Edition, Pearson Education, 2017.

Reference Books

1. G. K. Kharate, *Digital Electronics*, Oxford University Press, 2010

2. John F. Wakerly, *Digital Design Principles and Practices*, Fifth Edition, Pearson Education, 2017.

3. Charles H. Roth Jr, Larry L. Kinney, *Fundamentals of Logic Design*, Sixth Edition, CENGAGE Learning, 2013

4.Donald D. Givone, Digital Principles and Design‖, Tata McGraw Hill, 2003.

Part-III BCA / Semester – IV / COMPREHENSION IN COMPUTER APPLICATIONS – II (U23CA4C2)

Lecture Hours	:	**Tutorial Hours :**	-
Practical Hours	: -	**No. of Credits : 01**	
Contact Hours per Semester	:		
Contact hours per Week	:		
Internal Marks	:		
External Marks	: 50		
Total Marks	: 50		

Part-IV BCA / Semester – IV / Skill Enhancement Courses / SEC 5: PHP PROGRAMMING (U23CA4S4)

Lecture Hours	: 25	**Tutorial Hours**	: 05
Practical Hours	: -	**No. of Credits**	: 02
Contact Hours per Semester	: 30		
Contact hours per Week	: 2		
Internal Marks	: -		
External Marks	: 50		
Total Marks	: 50		

Objectives of the Course

This course aims at providing knowledge on

- To provide the necessary knowledge on basics of PHP.
- To design and develop dynamic, database-driven web applications using PHP version.
- To get an experience on various web application development techniques
- To learn the necessary concepts for working with the files using PHP.
- To get acknowledge on OOPS with PHP.

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students will be able to

CO1 write PHP scripts to handle HTML forms

CO2 write regular expressions including modifiers, operators, and meta characters.

CO3 create PHP Program using the concept of array.

CO4 create PHP programs that use various PHP library functions

CO5 manipulate files and directories.

CO-PO and PSO Mapping (Course Articulation Matrix)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	2	3	2	3	3	3	3
CO2	2	1	3	3	2	2	2	3	3	3
CO3	3	3	1	2	1	3	2	3	3	3
CO4	2	3	3	1	2	1	2	3	3	3
CO5	3	2	3	2	3	2	2	3	3	2
Total Contribution of COs to POs and PSOs	12	11	12	10	11	10	11	15	15	14
Weighted percentage of Course Contribution to Pos	80.00	73.33	80.00	66.67	73.33	66.67	73.33	100	100	93.33

0- No Correlation   1-Weak   2-Moderate   3-Strong

Course Content

Unit 1 Introduction to PHP (L-5hrs; T-1hrs)

Introduction to PHP-Basic Knowledge of websites-Introduction of Dynamic Website-Introduction to PHP-Scope of PHP-XAMPP and WAMP Installation.

Unit 2 Basics of PHP (L-5hrs; T-1hrs)

PHP Programming Basics-Syntax of PHP-Embedding PHP in HTML-Embedding HTML in PHP. Introduction to PHP Variable -Understanding Data Types -Using Operators -Using Conditional Statements -If (), else if() and else if condition Statement.

Unit 3 Looping Statements and Arrays (L-5hrs; T-1hrs)

Switch () Statements-Using the while () Loop-Using the for () Loop PHP Functions. PHP Functions Creating an Array-Modifying Array Elements-Processing Arrays with Loops-Grouping Form Selections with Arrays-Using Array Functions.

Unit 4 Files (L-5hrs; T-1hrs)

PHP Advanced Concepts -Reading and Writing Files -Reading Data from a File.

Unit 5 Sessions and Cookies (L-5hrs; T-1hrs)

Managing Sessions and Using Session Variables-Destroying a Session-Storing Data in Cookies-Setting Cookies.

Recommended Texts

1. Lynnmighley and Michael Morrison.,*Head First PHP & MySQL*: A Brain-Friendly Guide,2009.
2. Alan Forbes*, The Joy of PHP:A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL.*

Reference Books

1. Steven Holzner ,*PHP*: *The Complete Reference*.
2. DT Editorial Services(Author),–*HTML5 Black Book*(CoversCSS3,JavaScript,XML, XHTML,AJAX,PHP,jQuery),Paperback 2016,2ndEdition.

Website and E-learning sources

1. Refer MOOC Courses like NPTEL and SWAYAM
2. https://www.w3schools.com/php/default.asp

Part-IV BCA / Semester – IV / Skill Enhancement Courses / SEC-6: PHP PROGRAMMING LAB (U23CA4SP)

Lecture Hours	: -	Tutorial Hours : -	
Practical Hours	: 30	No. of Credits :02	
Contact Hours per Semester : 30			
Contact hours per Week	: 2		
Internal Marks	: -		
External Marks	: 50		
Total Marks	: 50		

Objectives of the Course

This course aims at providing knowledge on
- To provide the necessary knowledge on basics of PHP.
- To design and develop dynamic, database-driven web applications using PHP version.
- To introduce the importance of PHP in web page design.
- To understand the features like arrays, functions, and forms in PHP
- To understand files, OOPs concepts cookies, sessions and database.

Course Learning Outcomes (for Mapping with POs and PSOs)

On completion of the course the students will be able to

- **CO1** write PHP scripts to handle HTML forms
- **CO2** write regular expressions including modifiers, operators, and meta characters.
- **CO3** utilizing the basic concepts of statements and arrays.
- **CO4** create PHP programs that use various PHP library functions
- **CO5** manipulate files and directories.

CO-PO and PSO Mapping (Course Articulation Matrix)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2	2	2	2	3	2	3	3	3	3
CO2	2	1	3	3	2	2	2	3	3	3
CO3	3	3	1	2	1	3	2	3	3	3
CO4	2	3	3	1	2	1	2	3	3	3
CO5	3	2	3	2	3	2	2	3	3	2
Total Contribution of COs to POs and PSOs	12	11	12	10	11	10	11	15	15	14
Weighted percentage of Course Contribution to POs	80.00	73.33	80.00	66.67	73.33	66.67	73.33	100	100	93.33

0- No Correlation　　1-Weak　　2-Moderate　　3-Strong

LIST OF PHP PROGRAMMING LAB

1. Write a PHP program to find Armstrong number
2. Write a PHP program to display Fibonacci Series
3. Write a PHP Program to display biodata of a person
4. Write a PHP Program to reverse a string
5. Write a PHP Program to check perfect number
6. Write a PHP Program to store date time in a cookie
7. Write a PHP Program to display selected item from a list box
8. Write a PHP Program to perform array operations
9. Write a PHP program using function
10. Write a PHP Program to create a login page
11. Write a PHP Program to display the mark list of a student
12. Write a PHP program to Read from existing file.
13. Write a PHP program to Write a file
14. Write a PHP program to calculate Date and Time function

Recommended Texts

1. Lynnmighley and Michael Morrison, *Head First PHP &MySQL*: A Brain-Friendly Guide,2009.
2. Alan Forbes, *The Joy of PHP:A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL.*

Reference Books

1. Steven Holzner PHP: *The Complete Reference*.
2. DT Editorial Services(Author),−*HTML5 Black Book*(CoversCSS3,JavaScript,XML, XHTML,AJAX,PHP,jQuery),2ndEdition, Paperback,2016.

Website and E-learning sources

1. Refer MOOC Courses like NPTEL and SWAYAM
2. https://www.w3schools.com/php/default.asp

Part-IV BCA / Semester – IV /
YOGA & VALUE EDUCATION (U23AE402)

Lecture Hours	: 20	**Tutorial Hours :**	-
Practical Hours	: 10	**No. of Credits : 02**	
Contact Hours per Semester	: 30		
Contact hours per Week	: 2		
Internal Marks	: -		
External Marks	: 50		
Total Marks	: 50		

Objectives of the Course

Human beings are facing enormous problems in this 21st century and thus leading a meaningful Life is really challenging. It is both internal and external factors that prevent one not to have a peaceful life. It is the need of the hour to impart the ways and means of holistic living to student learners.

Course Outcomes

On completing of the Course, the learner will be able to

CO1 remember the scientific basis of yoga, pranayama, and kiriyas, recall the importance of the practice of yoga for holistic living, reproduce human and moral values for moral and self-development.

CO2 understand the scientific basis and importance of yoga, demonstrate human values, morals, and responsibilities towards society and measures to eradicate social values.

CO3 apply the concepts and tools of yoga for self and moral development to lead a holistic living, identify social evils and execute measures to solve them.

CO4 analyze the types and paths of yoga, identify the inherent difficulties in acquiring moral Values examine and develop self-soothing mechanisms and explore the social evils and measures to overcome them.

CO5 evaluate the merits of practicing yogasanas, pranayamas and yogic kiriya, assess the human and moral values needed for self-development / holistic living, discuss various social evils and find ways to eradicate them.

Course Content

Unit 1 Science Of Yoga   (T-03hrs; P-10hrs)
Science of Yoga: Meaning - Panchakosha - **Types of yoga**: Karma yoga – Bakthi Yoga - Jnana yoga - Raja yoga - **Paths of Yoga**: Yama - Niyama - Asana - Pranayama - Prathyahara - Dharana - Dhyana - Samadhi.
(Practice: SuksmaVyama – Surya Namaskar – Basic set of Asanas, Pranayama & yogic kriyas)

Unit 2 Values For Life   (T- 04hrs)
Human Values: Definition - Nature – Types - Process and Significance - Social Consciousness and responsibility - Holistic living.

Unit 3 Moral Development   (T- 04hrs)
Morality: Moral Development - Inherent difficulties in Acquiring moral Values -Truth – Commitment - Honesty and Integrity - Forgiveness and Love -Empathy and ability to sacrifice.

Unit 4 Self Development   (T- 04hrs)

Self-Development: Meaning - Growth mindset - Self-soothing mechanism - Developing resilience – Body Language - Good Manners and Etiquette

Unit 5 Social Evils   (T-05hrs)

Social Evils: Meaning - Domestic violence - Corruption - Terrorism - Measures to eradicate social evils.

Reference Books

1. Study Material: The work book compiled by the TEAM of GVN College
2. Yoga: (Asanas, Pranayama, Mudra, Kriya) Vivekananda Kendra (1977), Vivekananda Prakasan Trust, Chennai.

Website and E-Learning Sources

1. https://www.mea.gov.in/in-focusarticle.htm?25096/Yoga+Its+Origin+History+and+Development
2. https://www.incredibleindia.org/content/incredibleindia/en/blogs/india-the-land-of-yoga.html
3. https://www.artofliving.org/in-en/yoga/yoga-for-beginners/science-behind-yoga
4. https://www.livescience.com/35129-yoga-increases-brain-function-bone-density.html
5. https://kripalu.org/presenters-programs/science-yoga

Part-IV BCA / Semester – IV / INTERNSHIP/INDUSTRIAL TRAINING/MINI PROJECT
(U23CA5IT)