



**Rayat Shikshan Sanstha's
KARMAVEER BHAURAO PATIL
MAHAVIDYALAYA,
PANDHARPUR
(AUTONOMOUS)
Pandharpur- 413304**



B.C.A. – I

(Choice Based Credit, Grading and Semester System with effect from the academic year 2023-2024)

Rayat Shikshan Sanstha's
Karmaveer Bhaurao Patil Mahavidyalaya, Pandharpur
(Autonomous)
Pandharpur-413304(Maharashtra)

Syllabus for Approval as per NEP 2020		
Sr.No.	Headings	Particulars
1	Class	B.C.A. -I
2	Eligibility for Admission	Passing HSC exam / Diploma
3	Name of the Course	B. C. A.
4	Passing Marks	20
5	Evaluation	30 marks for semester +20 marks for internal evaluation
6	No. of Years/Semesters	02
7	Level	U.G.
8	Pattern	Semester
9	Status	Revised
10	To be implemented from Academic year	2023-24

BCA – I (Semester – I)

Course Type *	Course Code	Course Title	Remarks	Credit	No. of Lectures (Hrs)	No. of Practical (Hrs)	CA	Internal Assessment Marks	Total Marks
Major	BCA-5111 – MJ	Programming & Problem Solving using 'C'-I	Theory	2	30L		30	20	50
	BCA - 5112 – MJ	Programming & Problem Solving using 'C'-II	Theory	2	30L		30	20	50
	BCA - 5113 – MJP	Programming & Problem Solving using 'C' Practical-I	Practical	2		60L	25	25	50
Minor	BCA - 5114 – MN	Digital Marketing	Theory	2	30L		30	20	50
GE/ OE	BCA - 5115 - OE	Introduction to Computer	Theory	2	30L		30	20	50
	BCA-5116 - OEP	Introduction to Computer Practical	Practical	2		60L	25	25	50
VSC	BCA - 5117 - VSC	Information Technology	Theory	1	15L		15	10	25
	BCA - 5118- VSCP	Information Technology Practical	Practical	1		30L	15	10	25
SEC	BCA - 5119- SEC	Web Designing	Theory	1	15L		15	10	25
	BCA - 51110- SECP	Web Designing Practical	Practical	1		30L	15	10	25
AEC		English Part-A	Theory	2	30L		30	20	50
IKS	BCA	Computing	Theory	2	30L		30	20	50

	5111 1- IKS	Ancient India							
CC							30	20	50
Sem-II									
Major	BCA - 5121- MJ	OOPS With C++- I	Theory	2	30L		30	20	50
	BCA - 5122- MJ	OOPS With C++- II	Theory	2	30L		30	20	50
	BCA - 5123- MJP	OOPS With C++ Practical- II	Practic al	2		60L	25	25	50
Minor	BCA - 5124- MN	Python Programmi ng	Theory	1	15L		15	10	25
	BCA- 5125- MNP	Python Programmi ng Practical	Practic al	1		30L	15	10	25
OE	BCA - 5126- OE	E- Commerce	Theory	2	30L		30	20	50
	BCA - 5127- OEP	Introductio n to Google Tools Practical	Practic al	2		60L	25	25	50
VSC	BCA - 5128- VSC	Advanced Excel	Theory	1	15L		15	10	25
	BCA - 5129- VSC P	Advanced Excel Practical	Practic al	1		30L	15	10	25
SEC	BCA - 5121 0- SEC	Web Developme nt	Theory	1	15L		15	10	25
	BCA - 5121 1- SECP	Web Developme nt Practical	Practic al	1		30L	15	10	25
AEC		English	Theory		30L		30	20	50

		Part-B							
VEC	BCA - 51212- VEC	Introductio n to Machine Learning	Theory	2	30L		30	20	50
CC							30	20	50

* MJ-Major Course, MN-Minor Course, OE-Optional Elective, VSC-Vocational Skill Course , SEC-Skill enhancement Course ,IKS-Indian Knowledge System, VEC-Value Education Courses

* CA- College Assessment,

Credits: Theory – (2)

Paper Type: Major

Paper Code: BCA-511-MJ

Total Lectures: 30 Hrs.

Contact Hrs. (L): 2

Semester End Examination: 30 Marks

Internal Evaluation: 20 Marks

Course Objectives:

1. To introduce the foundations of computing, programming and problem- solving using computers.
2. To develop the ability to analyze a problem and devise an algorithm to solve it.
3. To develop the basic concepts and terminology of programming in general.
4. To implement algorithms in the 'C' language.
5. To test, debug and execute programs.

Course Outcomes (COs)

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

- Identify and define appropriate solutions to problems in the field of computer science and other related disciplinary areas.
- Illustrate the solutions to the problems in the form of simple algorithms and flowcharts
- Apply various computer programming language concepts and strategies to write and execute efficient and structured computer programs
- Analyze and compile the programs to detect any errors, debug and correct the programs.
- Test and perform critical evaluation of the program outcome to validate the program logic.
- Integrate the concepts of control structures, arrays to create more complex programming solutions

Unit I

15

Programming Methodology & Introduction to 'C':

Definition of Problem , Problem solving steps , Introduction to programming planning tools , Need of programming planning tools, Definition of Logic , Types of logic- 1) Sequence logic 2) Selection logic 3) Iteration logic

Algorithm-

Definition, Characteristics or features of algorithm, Examples of algorithm to solve problem.

Flowchart-

Definition, characteristics or features of flowchart, symbols used in flowchart , Examples that converts algorithms to flowchart

Introduction to 'C':

History or evolution of 'C' language, Features or characteristics of 'C' language.

,Structure of 'C' program, Compilation & execution of program.

C' Fundamentals:

'C' tokens- Keywords , Identifier, Special symbols ('C' charactersets), Variables, Constants, Data types- Primitive, Derived, User defined, Operators- Arithmetic, logical, assignment, relational, bitwise, conditional, increment, decrement, sizeof, comma operator etc., Type casting or type conversion , Use of 'typedef' and 'enum' , Precedence and associativity of operator, Header files and its use.

Data input and output operations:

Introduction to input and output operations, Introduction to header files, stdio.h header file functions - printf(), scanf(), getchar(), putchar(), Different format specifier with their use, Different back slash (escape sequence) character constants with their use

15

Unit II

Control Statements:

Introduction to control statement, Types of control statements-Selective or Decision making -Different forms of if statement , switch statement , Conditional (ternary) operator

Iterative or looping statement –

While loop , do-while loop ,for loop

Unconditional branching (jump) Statement –

breakstatement, continue statement, goto statement

Arrays:

Introduction & definition of an array, Types of an array
-One dimensional array, Two dimensional array, Multi- dimensional array ,
Declaration & initialization of an array, Memory allocation of an array, Character array (string)- Declaration, Operation on string, Inbuilt String functions

Books Recommended :

- 1) Programming in ANSI-C – E. Balgurusamy
- 2) The C programming Language - Ritchie and Kernighan
- 3) Let Us C - Y.C. Kanetkar.
- 4) A structure Programming Approach using 'C'- Behrouz A. Forouzan, RichardF. Gilberg

B.C.A. – I (Semester-I)

Course Title:-Programming and Problem Solving using 'C'-II

Credits: Theory – (2)

Paper Type: Major

Paper Code: BCA-512-MJ

Total Lectures: 30 Hrs.

Contact Hrs. (L): 2

Semester End Examination: 30 Marks

Internal Evaluation: 20 Marks

Course Objective:

1. Students will be able to develop logics which will help them to create programs, applications in 'C' language.
2. Also by learning the basic programming constructs they can easily switch over to any other language in future.

Course Outcomes (COs)

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

- Divide the programs into separate modules by writing user defined functions
- Implement various standard library and execute the dynamic memory management techniques using the concept of pointers
- Evaluate the programs to test and validate the output
- Design and write programs to implement the concepts of functions, pointers and in C programming

Unit-I : Functions

15

Introduction & definition of function, Need or use of function, Types of Functions- Inbuilt/Predefined/Library functions, User defined function, Steps to add or include user defined function in program-Function declaration (Prototyping), Function calling , Function definition (Function Implementation)

Types of Function - Function with argument without returnvalue, Function with argument with return value , Function without argument with return value, Function without argument without return value

Variables-Definition, characteristics & importance of local & global variable

Recursion.

Storage Classes -Introduction, definition of storage Classes,Explanation and use of storage classes- auto, extern, static, register

Unit-II : Pointers

15

Definition and declaration of pointer, Pointer initialization, Pointer and function, Pointer and array, Pointerof pointer, Call by value and Call by reference, Dynamic memory allocation.

Structures and Union

Definition and declaration, Array of structures, Passing structure to function, Pointer to structure,Nested structure, self referential structure, Size of and type def.

Macros and Preprocessing:-Features of C pre-processor, Macro Declaration, Expansion, File Inclusion

Books Recommended:

- 1) Programming in ANSII-C – E. Balgurusamy
- 2) The C programming Language - Ritchie and Kernighan.
- 3) Let Us C - Y.C. Kanetkar

B.C.A. – I (Semester-I)

Course Title:-Programming and Problem Solving using 'C'- Practical I

Credits: Theory – (2)

Paper Type: Major

Paper Code: BCA-513-MJP

Total Lectures: 60 Hrs.

Contact Hrs. (L): 4

Semester End Examination: 25 Marks

Internal Evaluation: 25 Marks

Tools / Software: Turbo C++ Editor /Notepad++/ DosBox/Visual Studio Code (VS Code)
Practical based on: Programming and Problem Solving using 'C' – I & II

1. WAP to find out factorial of any number.
2. WAP to print the sum and product of digits of an integer.
2. WAP to reverse a number.
3. Write a function that checks whether a given number is perfect or not.
4. Write a function to find whether a given no. is prime or not.
5. WAP to compute the factors of a given number.
6. WAP to find out palindrome numbers between 1 to 100.
7. Write a macro that swaps two numbers.
8. WAP to print a triangle of stars as follows (take number of lines from user):

```
*  
***  
*****  
*****  
*****
```

9. WAP to perform following actions on an array entered by the user:
 - i) Print the even-valued elements
 - ii) Print the odd-valued elements
 - iii) Calculate and print the sum and average of the elements of array
 - iv) Print the maximum and minimum element of array
 - v) Remove the duplicates from the array
 - vi) Print the array in reverse order
10. WAP a program to find out entered number is palindrome or not?
11. Write a program to display weekday name when user entered any day's first character (e.g.S=Sunday)
12. Write a program to calculate multiplication of two matrices.
13. Write a program that swaps two numbers using pointers.
14. Write a program in which a function is passed address of two variables and then alter its contents.
15. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
16. Write a program which count total number of vowels present in string.
17. Write a program to find sum of n elements entered by the user.

18. Write a program to allocate memory dynamically using malloc() & calloc().
19. WAP to illustrate difference between structure and union.
20. WAP to pass array of structure to function.

B.C.A. – I (Semester-I)

Course Title:-Digital Marketing

Credits: Theory – (2)

Paper Type: Minor

Total Lectures: 30 Hrs.

University Evaluation: 30 Mark

Paper Code: BCA -514-MN

Contact Hrs. (L): 2

Internal Evaluation: 20 Marks

OBJECTIVES:-

- To understand the basic concepts in Digital Marketing.
- To improve SEO techniques.
- To acquire knowledge of the latest digital practices for social media marketing and promotions.
- To promote a website's visibility using paid search, contextual advertising, and organic search rankings.

OUTCOMES:-

- Ability of understanding of digital marketing principles and strategies.
- Ability of how to reach your target customers using SEO.
- Use of social media sites to manage and enhance an organization's message and online presence.
- Ability to demonstrate their understanding of the various new medias such as; social media, mobile technology, web analytics, search engine optimization, viral advertising.

Unit I - Introduction to Digital Marketing:

Meaning of Digital Marketing, Differences from Traditional Marketing, Return of Investments on Digital Marketing vs. Traditional Marketing, E Commerce, Tools used for successful marketing, SWOT Analysis of Business for Digital Marketing, Media and promotion plan. Blogs, Websites, Portal and Their Differences, Visibility, Visitor Engagement, Conversion Process, Retention, Performance Evaluation, Online Reputation Management

Unit II –

Search Engine Optimization (SEO): Optimization, Definition, its importance, Strategies and techniques used to optimize any article/page/website/blog for traffic generation and revenue, different On page Optimization Techniques, different Off Page Optimization Techniques. Preparing Reports, Creating Search Campaigns, and Creating Display Campaigns.

Social Media Optimization (SMO):

Introduction to Social media, Types of Social Media platforms (Facebook, Twitter, Instagram, YouTube), Roles of Social Media in Marketing, Goals and Strategies, Facebook Marketing, Email Marketing, Google plus marketing, Word press Blog Creation, Twitter Marketing, LinkedIn Marketing, Pinterest, Instagram Marketing, eCommerce Marketing, Affiliate Marketing, SMS Marketing, Page Optimization, social media Analytical Tools.

Unit III –

Search Engine Marketing: Introduction and Use of Search Engine Marketing, Introduction to Online Advertising and Ad words, Tools used — Pay Per Click, Google Adwords, Display Advertising Techniques, Advertisement Designing, Adwords Account And Campaign Basics, Adwords Targeting And Placement, Adwords Bidding And Budgeting, Adwords Tools, Opportunities, Optimizing Performance, Ads Type, Bidding Strategies, Search Network, Display Network, Shopping Ads, Video

Ads, Universal App Ads, Tracking Script, Remarketing, Performance Monitoring, Report Generation.

Website Traffic Analysis:

Web Analytics Tools, Google Analytics, Navigating Google Analytics, Traffic Sources, Acquisition, Behavior, Content, Visitors, Live Data, Demographics

Books Recommended:

- 1) Ryan, D. (2014). Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation, Kogan Page Limited.
- 2) The Beginner's Guide to Digital Marketing (2015). Digital Marketer. Pulizzi, J. (2014) Epic Content Marketing, McGraw Hill Education.
- 3) Lorrie Thomas. The McGraw-Hill 36-Hour Course: Online Marketing, McGraw Hill.

B.C.A. – I (Semester-I)

Course Title:-Introduction to computer

Paper Type: OE

Paper Code: BCA-515-OE

Credits: Theory – (2)

Total Lectures: 30 Hrs.

Contact Hrs. (L): 2

Semester End Examination: 30 Marks

Internal Evaluation: 20 Marks

Objectives:

1. Familiarize the concepts of operating systems, programming languages, peripheral devices, networking, multimedia and internet.
2. It will help them to pursue specialized programs leading to technical and professional careers and certifications in the IT industry.
3. The focus of the subject is on introducing skills relating to IT basics, computer applications, etc.

Course Outcomes (COs)

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

- State the characteristics of computer and identify the components of computer system.
- Apply various office tools and strategies to execute efficient and structured office work.
- Describe computer generations, types of computer software.
- Explain about internet and email management.
- Select and use the appropriate software application to complete a particular task such as a word Processing skills.

Unit-I : Introduction to Computer, Structure and Working of Computer

8

Introduction to Computer: Computer Characteristics, Concept of Hardware, Software, Evolution of computer and Generations, Types of Computer – Analog and Digital computers, Hybrid Computers, General Purpose and Special Purpose Computer, Limitations of Computer, Applications of Computer in Various Fields.

Structure and Working of Computer: Structure and Working of Computer: Functional Block Diagram of Computer. CPU, ALU, Memory Unit, Bus Structure of Digital Computer Address, Data and Control Bus.

Unit-II : Input/output Devices

12

Input Device: Keyboard, Voice Recognition Device, Digitizers, Point and draw devices- mouse, joystick, track ball, light pen, Data scanning devices:- image scanner, OCR, OMR, MICR, Bar code reader, card reader

Output Devices: Monitor, Printer: - laser printer, dot-matrix printer, ink jet printer, Daisywheel Laser, Line (Chain and Drum), Plotters.

Computer Memory

Memory Concept, Memory Cell, Memory Organization, Semi-conductor Memory –

RAM, ROM, PROM, EPROM, Secondary Storage Devices – Magnetic Tape, Magnetic Disk (Floppy Disk and Hard Disk.), Compact Disk.

Unit-III :

10

Computer Language and Software: Algorithm, Flowcharts, Machine Language, Assembly Language, High Level Language, Assembler, Compiler, Interpreter. Characteristics of Good Language. Software – System and Application Software

Computer Communication and Networks

Basic of Computer Networks (LAN, MAN, WAN), Internet- Concept of Internet, Applications of Internet, Connecting to the Internet, Troubleshooting, World Wide Web (WWW), Web Browsing Software, Search Engines- Popular Search Engines /Search for content, Accessing Web Browser, Downloading WebPages, Printing Web Pages, Understanding URL, Surfing the web.

Basics of E-mail- What is an Electronic Mail, Email Addressing, Using E-mails and Opening Email Account, Mailbox: Inbox and Outbox, Creating and Sending a new E-mail, Replying to an E-mail Message, Forwarding an E-mail message, sorting and searching emails, Document collaboration, Instant Messaging and Collaboration, Using Instant messaging, instant messaging providers Netiquettes

Books Recommended:

- 1) Computer Fundamental –P.K. Sinha
- 2) Computer Fundamental – V. Rajaraman
- 3) Computer Today – Donaid N. Sanders.

Course Title:-Introduction to computer Practical

Paper Type: OE

Paper Code: BCA-516-OE

Credits: Theory – (2)

Total Lectures: 30 Hrs.

Contact Hrs. (L): 2

Semester End Examination: 25 Marks

Internal Evaluation: 25 Marks

1. Windows

Starting Windows- Browsing Start Menu, Manipulating Windows-Moving, Resizing, Closing, Windows, Minimizing and Maximizing Windows, Working With Multiple Windows Using Windows Application. Using Word- Pad to create a document, entering text and saving the work. Using my computer- Changing the icon arrangement, To View the floppy disk. To manage files. selecting one or more files, copying a file, delete a file, Drag and drop to move a file.

2. MS-Office 2013

- a. MS-Word
- b. MS-Excel
- c. MS-PowerPoint
- d. MS-Access

B.C.A. – I (Semester-I)

Course Title:-Information Technology

Credits: Theory – (1)

Paper Type: VSC

Total Lectures: 15 Hrs.

Semester End Examination: 15 Marks

Paper Code: BCA-517-VSC

Contact Hrs. (L): 1

Internal Evaluation: 10 Marks

Objectives:

1. Familiarize the concepts of operating systems, programming languages, peripheral devices, networking, multimedia and internet.
2. It will help them to pursue specialized programs leading to technical and professional careers and certifications in the IT industry.
3. The focus of the subject is on introducing skills relating to IT basics, computer applications, etc.

Course Outcomes: At the end of this course, the student should be able to:

- To understand basic concepts and terminology of information technology.
- To a basic understanding of personal computers and their operations.
- To understand various input and output devices.
- To understand internet concepts.

Unit-I : Introduction to Computer, Structure and Working of Computer 5

Introduction to Computer: Computer Characteristics, Concept of Hardware, Software, Evolution of computer and Generations, Types of Computer – Analog and Digital computers, Hybrid Computers, General Purpose and Special Purpose Computer, Limitations of Computer, Applications of Computer in Various Fields.

Structure and Working of Computer: Structure and Working of Computer: Functional Block Diagram of Computer. CPU, ALU, Memory Unit, Bus Structure of Digital Computer Address, Data and Control Bus.

Unit-II : Input/output Devices 5

Input Device: Keyboard, Voice Recognition Device, Digitizers, Point and draw devices- mouse, joystick, track ball, light pen, Data scanning devices:- image scanner, OCR, OMR, MICR, Bar code reader, card reader

Output Devices: Monitor, Printer: - laser printer, dot-matrix printer, ink jet printer, Daisywheel Laser, Line (Chain and Drum), Plotters.

Computer Memory

Memory Concept, Memory Cell, Memory Organization, Semi-conductor Memory -- RAM, ROM, PROM, EPROM, Secondary Storage Devices – Floppy Disk and Hard Disk., Compact Disk.

Books Recommended:

1. Computer Fundamental –P.K. Sinha
2. Computer Fundamental – V. Rajaraman
3. Computer Today – Donaid N. Sanders.

B.C.A. – I (Semester-I)

Course Title:-Information Technology Practical

Credits: Theory – (1)

Paper Type: VSC

Total Lectures: 30 Hrs.

Semester End Examination: 115 Marks

Paper Code: BCA-518-VSC

Contact Hrs. (L): 2

Internal Evaluation: 10 Marks

1. MS-Office 2013

- a. MS-Word
- b. MS-Excel
- c. MS-PowerPoint
- d. MS-Access

B.C.A. – I (Semester-I)

Course Title:-Web Designing

Credits: Theory – (1)

Paper Type: SEC

Paper Code: BCA -519- SEC

Total Lectures: 15 Hrs.

Contact Hrs. (L): 1

Semester End Examination: 15 Marks

Internal Evaluation: 10 Marks

Course Objectives:

1. Understand The Web Designing techniques.
2. Analyze and design real time web applications
3. Develop web based application using suitable client side web technologies

Course Outcomes:

The student will be able to:

- Analyze a web page and identify its elements and attributes.
- Create web pages using HTML and Cascading Style Sheets.
- Build static web pages using HTML,CSS (Client side programming).

Unit-I : 1: Overview of HTML

5

Introduction to HTML, Overview of basic HTML, Structure of HTML, Creating and opening HTML file, Singular and paired tags, Text form Lists, Image, Image Map, Table, Frame Form, get and post method, input tag.

2: Introduction to HTML5:

5

Need of HTML5, DOCTYPE Element, Events in HTML5, Input tag in HTML5- (Type, Auto focus, placeholder, required etc. attributes.), Graphics in HTML5, Media tags in HTML5.

3: Use OF CSS

5

Introduction to CSS, Use of CSS, Types of CSS, Selectors, Properties, Values., CSS Properties- Background, Text, Fonts, Link, List, Table, Box Model, Border, Margin, Padding, Display, Positioning, Floating, Opacity, Media type, Back- grounds and Borders Image, Values and Replaced Content, Text Effects.

Books Recommended:

- 1) HTML5 Black Book- Kogent Learning Solutions Inc Dreamtech.
- 2) Beginning HTML and CSS- Rob Larsen.
- 3) HTML_ &_ CSS_ The_ Complete_ Reference- Thomas A. Powell. (Fifth Edition).

B.C.A. – I (Semester-I)

Course Title:-Web Designing Practical

Credits: -1

Paper Type: SEC

Paper Code: BCA -520- SEC

Total Lectures: 30 Hrs.

Contact Hrs. (L): 2

Semester End Examination: 15 Marks

Internal Evaluation: 10 Marks

1. Design HTML page to display student Information.
2. Design HTML page for all lists.
3. Design HTML page for display Table.
4. Design HTML page for Image map, frameset tags.
5. Create a web page using the Internal/ Linked/ External style sheet.
6. Create web page using Text formatting properties, CSS Borders, Margin Properties, Colorproperties.

B.C.A. – I (Semester-I)

Course Title:- Computing Science in Ancient India

Credits: Theory – (2)

Paper Type: IKS

Total Lectures: 30 Hrs.

Semester End Examination: 30 Marks

Paper Code: BCA -521- IKS

Contact Hrs. (L): 2

Internal Evaluation: 20 Marks

Course Objectives:

1. To make students aware of history of computing in Ancient India

Course Outcomes:

On completion of this course, students will be able to:

- To study some algorithms in Chhanda shastra.
- Introduction of Cryptography in Ancient India.

Unit 1: Background and context

Ganit – Gan – to compute

Need of algorithms/ sophisticated mathematics algorithms in ancient India

04

Unit 2: Chhanda Shastra

Introduction to Chhanda Shastra by Pingala Acharya

Equivalence to Binary System

Some algorithms in Chhanda Shastra – Prastara, Nashtam, U'ddhistam, Sankhya, Lagakriya

Meru Prastara (Pascal triangle)

12

Unit 3: Cryptography in Ancient India

What is Cryptography?

Rhythmic, Dialectical, Aphoristic

Representing numbers in India

Akshara Sankhya system of Aryabhatta

Akshara Sankhya system of Katpayadi

14

Textbooks/ References:

1. Computing Science in ancient India by T.N. Rao, Subhash Kak, Meru Publication.
2. <http://www.youtube.com/@ProjectShivoham>

Semester-II
Course Title:- OOPS with C++ - I

Credits: Theory – (2)

Paper Type: Major

Total Lectures: 30 Hrs.

Semester End Examination: 30 Marks

Paper Code: BCA -521-MJ

Contact Hrs. (L): 2

Internal Evaluation: 20 Marks

OBJECTIVES:-

- To understand how C++ improves C with object-oriented features.
- To learn the syntax and semantics of the C++ programming language.
- To learn how to design C++ classes for code reuse.
- To learn how to implement copy constructors and class member functions.
- To understand the concept of data abstraction and encapsulation.
- To learn how to overload functions and operators in C++.

OUTCOMES:

- Understand the features of C++ supporting object oriented programming
- Understand the relative merits of C++ as an object oriented programming language
- Understand how to produce object-oriented software using C++

Unit:-I Introduction to (Object Oriented Programming)OOP:

15

Introduction to OOP, Features of OOP's- Class, Object, Data Abstraction and encapsulation, Data hiding, Message passing, polymorphism, inheritance, persistency, delegation, extensibility. Comparison between POP(Procedural Oriented Programming) and OOP. Advantages of OOP's. Application of OOP.

Introduction to C++:

History of C++, C++ basics(C++ tokens)- Keywords, identifiers, data types, constants, operators, special symbols, control flow statements. Types of Variables- Value, pointer and reference. Structure of C++ program, Introduction to cin and cout objects. Function and its types, template, Default argument, Parameter passing methods, inline function . Static polymorphism(Function overloading)

Unit - II Classes and Objects:

15

Introduction to class and object. Defining class (class specification). Creating object .Access specifier(Visibility modes)-public, protected, private. Class members- data members, member & Non-member function. Defining member function inside and outside the class. Static data members and static member functions. Pointer to object, Array of object, Returning objects from functions .Passing object as parameter by value, by pointer, by reference .Dynamic memory allocation (new, delete) Friend function and friend class, nesting of classes. Constructors Concept, characteristics of constructor .Types of constructor- default, parameterized and copy ,Constructor overloading, Constructor with default argument .Destructor Concept, characteristics of destructor. Static polymorphism (Operator overloading) Concept- rules to overload operator, unary and binary operator overloading, overloading operator using member function and friend function. Type conversion (type casting)- implicit and explicit

Books Recommended:

1. *OOP in C++* – E-balagurusamy Tata McGraw Hill
2. *The Complete Reference C++*-Herbert Schildt McGraw Hill Publications.
3. *Mastering C++*-K. R. Venugopal

Semester-II

Course Title:- OOPS with C++ - II

Credits: Theory – (2)

Paper Type: Major

Total Lectures: 30 Hrs.

Semester End Examination: 30 Marks

Paper Code: BCA -522-MJ

Contact Hrs. (L): 2

Internal Evaluation: 20 Marks

OBJECTIVE:-

- To learn how containment and inheritance promote code reuse in C++.
- To learn how inheritance and virtual functions implement dynamic binding with polymorphism.
- To learn how to do different operations on files.
- To learn how to use exception handling in C++ programs.

Outcomes:-

- Understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism
- Understand advanced features of C++ specifically stream I/O. and operator overloading

Unit I. Inheritance and Runtime Polymorphism:

15

1. Inheritance

Introduction of inheritance, benefits, use, Defining derived class, Types of derivations, Types (Forms) of Inheritance- Single, Multi-level, Multiple, Hierarchical, Hybrid, Multi-path (Virtual base class), Behavior of constructors and destructor in inheritance Overloaded member functions, Pointer to base class, Pointer to derived class, Object composition-delegation

2. Runtime polymorphism-

Introduction of runtime polymorphism, Virtual functions- Concept, characteristics and use of virtual function, Pure virtual function-Concept, characteristics and Use, Abstract class, virtual destructors.

Unit II. Stream and Files:

15

Introduction to streams in C++, Stream classes and File stream classes, Formatted and unformatted I/O functions and Manipulators.

Exception Handling and Template:

Introduction to Exception handling, Exception handling mechanism-try, catch, throw keywords, Custom exception, Introduction to function template- overloaded function and user defined template, class template- inheritance of class template, overloaded operators and class template containership.

Books Recommended:

- 1) *OOP in C++* – E-balagurusamy
- 2) *Mastering C++* - K.R. Venugopal
- 3) *Structured approach using C++* – Behrouz A. Forouzan

Type: Major Practical
Course Title-OOPS with C++ - I and II : Practical-II

Credits: Practical – (2)

Paper Type: Major

Paper Code: BCA -523-MJP

Total Lectures: 60 Hrs.

Contact Hrs. (L): 4

Semester End Examination: 25 Marks

Internal Evaluation: 25 Marks

Tools / Software: Turbo C++ Editor /Notepad++/ DosBox/Visual Studio Code (VS Code)

Practical based on: OOPS with C++ - I and II

A) Sample Programs on OOP's with C++-I and II

- 1) Write different programs in 'C++' language that shows use of array, pointers variable, reference variable, cin and cout objects, scope resolution operators, basic operators
- 2) Write a program that shows use of class and object.
- 3) Write a program that shows parameter passing techniques in C++
- 4) Write a program that shows defining member function inside and outside of class body
- 5) Write a program that demonstrate use of inline function
- 6) Write a program to implement function overloading concept
- 7) Write a program to implement parameterized and copy constructor
- 8) Write a program that shows use of static data member and static member function.
- 9) Write a program that shows use of nesting classes.
- 10) Write a program that shows passing and returning object from function.
- 11) Write a program that shows use of new and delete operator
- 12) Write a program that shows explicit type conversion
- 13) Write a program to overload different unary and binary operators by using friend and member function.
- 14) Write a program to calculate factorial of given number by using recursion.
- 15) Write a program for addition, subtraction, multiplication and division of two complex numbers by using return by object method.
- 16) Create 2 distance classes "class A" stores distance in meter and cm and "Class B" stores distance in feet and inches and add two distances by friend function and display the result.
- 17) Generate the result for 5 students with following data - Name, exam no. Theory marks in 5 subjects, grade. Use array of object concept.
- 18) Write a program for constructor overloading.
- 19) Write a program to calculate root of quadratic equation by using default argument constructor.
- 20) Write a program to demonstrate friend function, friend class, member function of a class is friend to another class.
- 21) Write a program to count no. of objects created by using static data member & member function.
- 22) Write a program to overload unary operators (++ , -- , -).
- 23) Write a program to overload binary operator.(+ , - , * , / , %) by using member function and friend function.

Inheritance & Runtime polymorphism

- 24) Write a program to implement single inheritance.
- 25) Write a program to implement multi-level inheritance
- 26) Write a program to implement multiple inheritance
- 27) Write a program to implement hierarchical inheritance
- 28) Write a program to implement hybrid inheritance
- 29) Write a program to implement multi-path inheritance
- 30) Write a program that shows use of pointer to base class

- 31) Write a program that shows use of pointer to derived class
- 32) Write a program that shows use of virtual function.
- 33) Write a program that shows use of pure virtual function.
- 34) Write a program that shows use of abstract class
- 35) Write a program that shows use of virtual destructor
- 36) Write a program that shows behavior of constructor and destructor in inheritance.

Streams and Files

- 37) Write a program that shows use of istream class.
- 38) Write a program that shows use of ostream class.
- 39) Write a program that shows use of different manipulators.

Exception Handling and template

- 40) Write a program that shows use try, catch and throw
- 41) Write a program that shows use multiple catch blocks.
- 42) Write a program that shows use of custom exception.
- 43) Write a program that shows use of function template
- 44) Write a program that shows use of class template

B.C.A. – I (Semester-II)

Course Title:-Python Programming

Credits: Theory – (2)

Paper Type: Minor

Paper Code: BCA -524-MN

Total Lectures: 30 Hrs.

Contact Hrs. (L): 2

Semester End Examination: 30 Marks

Internal Evaluation: 20 Marks

Course Objective:

1. To learn the fundamentals of python Programming
2. To learn different data structures used in Python
3. To learn different control statements used in logic development.
4. To learn the various operations on the array, list, tuple, string, set, and dictionary.

Course Outcomes:

Upon successful completion of this course, students will be able to-

- Understand the features or characteristics of Python.
- Understand the concept of Python Virtual Machine, Python Data types. Command Line Argument. Operators.
- Explore Integrated Development Environment (IDE).
- Do programs using conditional control statements and also use the concept of Looping for doing programs.
- Describe the concept of strings, Collection Lists, Tuples and Dictionaries.

Unit - 1

(08)

Introduction: Features of python, steps for execution of python program, python virtual machine, memory management, garbage collection, Installation of python software. setting the path to operating system environment, writing the first python program, executing a python program.

Data types in python: Data types, type conversion- implicit and explicit, comments, literals, constants, Identifiers, naming conventions, operators, operator precedence and associativity, input and output statements, command-line arguments.

Unit - 2

(10)

Control Statements: if statement, if..else statement, if..elif..else statement, while loop, for loop, else suite, infinite loop, nested loops, word indentation, break statement, continue statement, pass statement, assert statement, return statement.

Arrays in Python: Concept of array, advantages of array, creating an array, importing array module, indexing and slicing on arrays, methods of array module, types of arrays.

String, List, Tuple, Set and Dictionary: Creating string, manipulating different operations on string, creating list, manipulating different operations on list, list comprehensions, creating tuple, manipulating different operations on tuple, creating set, manipulating different operations on set, creating dictionary, manipulating different operations on dictionary.

Reference Books:

1. Python: The Complete Reference by Martin C. Brown.
2. Core Python Programming, Dreamtech publications, by R. Nageswara Rao.
3. Python Programming, A modular approach, First Edition, Pearson, by Taneja Sheetal
4. Learning with Python, Dreamtech publications, by Allen Downey
5. Python Programming for the Absolute Beginner by Michael Dawson-Cengage Learning.

B.C.A. – I (Semester-II)
Course Title:- E-Commerce

Credits: Theory – (2)

Paper Type: OE

Paper Code: BCA-525-OE

Total Lectures: 30 Hrs.

Contact Hrs. (L): 2

Semester End Examination: 30 Marks

Internal Evaluation: 20 Marks

Objectives

1. Define e-commerce and describe how it differs from e-business
2. Identify the unique features of e-commerce.

Course Outcomes: After Completion of the subject student should able to

- Understand the basic concepts and technologies used in the field of management information systems:
- Have the knowledge of the different types of management information systems:
- Understand the processes of developing and implementing information systems:
- Be aware of the ethical, social, and security issues of information systems

Unit- I

6

Introduction to E-Commerce:

Introduction, Overview of E-Commerce, Scope, Activities and Goals of E-Commerce, E-Commerce Applications, Prospects of E-Commerce, Framework of E-Commerce, Growth of E-Commerce in India

Unit –II

10

Portals and E-Commerce:

Introduction to Portals, Difference between portal and website. Portal technologies, E-Commerce portals, B2B portals, Enterprise information portal, Payment gateways, Content management on the portals

Unit –III

14

Commerce and E-Business:

E-Commerce applications, Difference between E-Commerce and E- Business, Models of business : C2C, G2G B2G, B2P, P2P, B2A, C2A, B2B, B2C, E-distributor, Just in time delivery in e-business

Management of E-Commerce:

Managing E-Commerce, Exploring E-Commerce, Prospects of E-Commerce, Dot com companies, Comparison between conventional business and e-business, Organization of business in E-Commerce, Legal issues in E-Commerce, Problems on E-Commerce.

Reference Books:

1. "E-commerce: Business, Technology, Society" by Kenneth C. Laudon and Carol Guercio Traver.
2. "Electronic Commerce: A Managerial and Social Networks Perspective" by Efraim Turban, David King, Judy McKay, Peter Marshall, and Jae Kyu Lee.
3. "E-commerce: Concepts, Models, Strategies" by Ravi Kalakota and Andrew B. Whinston.
4. "E-commerce 2019: Business, Technology, Society" by Kenneth C. Laudon and Carol Guercio Traver.

B.C.A. – I (Semester-II)
Course Title:- Introduction to Google Tools

Credits: Practical – (2)

Paper Type: OE

Paper Code: BCA-526-OE

Total Lectures: 30 Hrs.

Contact Hrs. (L): 2

Semester End Examination: 25 Marks

Internal Evaluation: 25 Marks

1. Assignment on Google Email
2. Assignment on Google Drive
3. Assignment on Google Calendar
4. Assignment on Google Docs, Sheets, Slides
5. Assignment on G Talk
6. Assignment on Google Maps
7. Assignment on Google Contacts
8. Assignment on Google Assistant

B.C.A. – I (Semester-II)

Course Title:-Advanced Excel

Paper Type: VSC

Paper Code: BCA -527-VSC

Credits: Theory – (1)

Total Lectures: 15 Hrs.

Contact Hrs. (L): 2

Semester End Examination: 15 Marks

Internal Evaluation: 10 Marks

Course Objectives:

1. To Learn Edit worksheets using advanced enhancements and worksheet features.
2. To Learn Use 3D referencing to merge data from multiple worksheets.
3. To Learn Import and export data from the Internet and merge the data in to Excelworksheets and publish Excel worksheets on the web.
4. To Learn Create templates after writing complex worksheets and workbooks
5. To Learn Work with named ranges and create lists.

Course Outcomes :- Students Will Be Able to:

- Modify worksheets using advanced enhancements and worksheet features.
- Calculate 3D referencing to merge data from multiple worksheets.
- Construct templates after writing complex worksheets and workbooks
- Examine Import and Export data from Excel to other Office applications
- Enhance lists using pivot tables and pivot table charts

Unit – I Advance Excel –

What If Analysis ,Goal Seek ,Scenario Analysis, Data Tables (PMT Function). Solver Tool Logical Functions. If Function, How to Fix Errors, if error, Nested If ,Complex if andor functions.

Unit – II Data Validation –

Number, Date & Time Validation ,Text and List Validation .Customvalidations based on formula for a cell, Dynamic Dropdown List Creation using Data Validation – Dependency List Lookup Functions. Vlookup / HLookup, Index and Match .Creating Smooth User Interface Using Lookup, Nested Vlookup, Reverse Lookup using Choose Function, Worksheet linking using Indirect .Vlookup with Helper Column Pivot Tables ,CreatingSimple Pivot Tables, Basic and Advanced Value Field Setting, Classic Pivot table, Choosing Field, Filtering PivotTables, Modifying PivotTable Data, Grouping based on numbers and Dates, Calculated Field & Calculated Items.

Arrays Functions - What are the Array Formulas. Use of the Array Formulas?. Basic Examples of Arrays (Using ctrl+shift+enter)., Array with if,len and mid functions formulas., Array with Lookup functions. Advanced Use of formulas with Array.

Charts and slicers-Variou Charts i.e. Bar Charts / Pie Charts / Line Charts .Using SLICERS, Filter data with Slicers ,Manage Primary and Secondary Axis Excel Dashboard, Planning a Dashboard -Adding Tables and Charts to Dashboard ,Adding Dynamic Contents toDashboard.

Reference Books :-

1. Excel 2019 Bible - Michael Alexander - 1th edition - Wiley
2. Excel 2019 All-in-One for Dummies Greg Harvey 1st edition For Dummies
3. Excel for Beginners M.L. Humphrey 1st edition Independently Published

B.C.A. – I (Semester-II)

Course Title:-Advanced Excel Practical

Paper Type: VSC

Paper Code: BCA -528-VSC

Credits: Theory – (1)

Total Lectures: 30 Hrs.

Contact Hrs. (L): 2

Semester End Examination: 15 Marks

Internal Evaluation: 10 Marks

1. Working with the IF Statement.
2. Working with Sum IF and Count IF statements.
3. Working with Date & Time Validation
4. Working with Date & Time Validation
5. Working with Arrays Functions
6. Inserting Charts.

B.C.A. – I (Semester-II)

Course Title:-Web Development

Paper Type: SEC

Paper Code: BCA -529- SEC

Credits: Theory – (1)

Total Lectures: 15 Hrs.

Contact Hrs. (L): 1

Semester End Examination: 15 Marks

Internal Evaluation: 10 Marks

Course Objectives:

1. On completion of this course, a student will be familiar with client server architecture and able to develop a web application using Javascript and JQuery technologies.
2. Students will gain the skills and project-based experience needed for entry into web application and development careers.
3. Use Java script for dynamic effects and to validate form input entry
4. Analyze to Use appropriate client-side or Server-side applications

Course Outcomes:

The student will be able to:

- Develop programming skills by the use of java script
- Develop dynamic web pages using JavaScript (Client side programming).
- Test Use appropriate client-side applications.
- Develop interactive web applications using JQuery.
- Extend this knowledge to .Net Platforms, Java Technologies, Full Stack Development

Unit-I : JavaScript

5

Introduction to JavaScript, JavaScript Variables, Data types, Operators, types of operators, Built in functions in JavaScript.

Control structure in JavaScript :

Control structure, DOM, Math, Array, History, Navigator, Location, Windows, String, Date, Document objects, user defined function, Validation in JavaScript, Event & event handling in JavaScript.

Unit-II : Introduction to JQuery

5

Introduction to jQuery, Need of JQuery, Adding jQuery to Your Web Pages, jQuery Syntax, jQuery Selectors, jQuery Event Methods, jQuery Effects - Hide and Show, Fading, Sliding, Animation.

Unit-III : JQuery functions

5

Callback Functions, jQuery - Chaining, JQuery - Get and Set Content and Attributes, jQuery - Add Elements, Add Several New Elements, jQuery -Remove Elements, jQuery - Get and Set CSS Classes, jQuery - css() Method, jQuery - The noConflict() Method

Books Recommended:

- 1) HTML5 Black Book- Kogent Learning Solutions Inc Dreamtech.
- 2) Beginning JavaScript and CSS Development with jQuery- Richard York.
- 3) Beginning HTML and CSS-Rob Larsen.
- 4) HTML & CSS The Complete Reference-Thomas A. Powell. (Fifth Edition).
- 5) W3schools.com

B.C.A. – I (Semester-II)

Course Title:-Web Development Practical

Credit :- 1

Paper Type: SEC

Paper Code: BCA -530- SEC

Total Lectures: 30 Hrs.

Contact Hrs. (L): 2

Semester End Examination: 15 Marks

Internal Evaluation: 10 Marks

1. Create web page Using DIV and SPAN tag properties.
2. Write a JavaScript code working with functions: the alert Box, the confirm Box , the prompt Box etc.
3. Create standard calculator using JavaScript.
4. Create XML page to display student information

B.C.A. – I (Semester-II)

Course Title:- Introduction to Machine Learning

Paper Code: BCA -531- VEC

Paper Type: VEC

Credits: Theory – (2)

Total Lectures: 30 Hrs.

Semester End Examination: 30 Marks

Contact Hrs. (L): 2

Internal Evaluation: 20 Marks

Course objectives

1. To understand the concepts and the real world applications of Machine Learning.
2. To understand the data labelling.
4. Analyzing various machine learning algorithms.

Course Outcomes:

The student will be able to:

- 1) Understand different types of machine learning.
- 2) Understand how to label data in dataset
- 3) Understand how to train data for Machine Learning.
- 4) Select feature for Machine Learning.

10

UNIT.I Introduction to ML and Labelled data

Machine Learning: Definition of ML, How does Machine Learning Work?. Features of ML, Need for ML, History of ML, Types of machine learning: supervised, unsupervised, semi_supervised and reinforcement learning, Applications of machine learning, Machine learning Life cycle, Machine learning model, steps in the design of learning system, challenges in machine learning,.

Introduction to Labelled data: Definition of Label, Introduction to Data Labelling in ML, Definition of Data Labelling, How does Data Labelling Work, Approaches to Data Labelling, Benefits and Challenges of Data Labelling, Use Cases of Data Labelling, Best Practices for Data Labelling, Introduction to Classification and its types.

UNIT-II Unlabeled Data, Dataset and Feature Selection

20

Unlabeled data: Definition of unlabeled data, Benefits of Using Unlabeled Data, Limitations of Using Unlabeled Data, Examples of Real-World Use Cases of Unlabeled Data, Introduction to clustering and its applications, Labeled Data vs. Unlabeled Data.

Dataset: What is a dataset?, Types of data in datasets, Types of datasets, Need of Dataset, Training Dataset and Test Dataset, Popular sources for Machine Learning datasets, Definition and steps of Data Pre-processing

Feature selection & Engineering: Definition of Feature, Introduction & Definition of feature selection, Need for Feature Selection, importance of feature selection. Feature selection technique, Feature Engineering & its techniques.

Reference Books:

1. Manohar Swamynathan "Mastering Machine Learning with python in Six Steps", Apress.
2. Machine Learning,'A probabilistic perspective,, MIT press,2012 by Kevin Murphy.
3. Shai Shalev-Shwartz, Shai Ben-David, "Understanding Machine Learning: From Theory to Algorithms,,.
4. Mark Summerfield, "Programming in python 3: A Complete Introduction to python programming...



**Chairman
B.O.S. in B.C.A.**

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Pandharpur (Autonomous)**