Vidnyan Mahavidhyalaya Sangola
Department of Computer Science
Teaching Plan

Teacher Name: Mr Kolawale D.S. **Academic Year: 2019-20**

Class	Subject	Month	Topics
BCA – II **Sem- III**	**OOP with C++**	**July**	**Introduction to (Object Oriented Programming)OOP :** Introduction to OOP Features of OOP's- Class, Object, Data Abstraction, Data encapsulation, Data hiding, Message passing, polymorphism, inheritance, persistency, delegation, extensibility Introduction to OOP languages. Application of OOP Comparison between POP (Procedural Oriented Programming) and OOP. Advantages of OOP's **Introduction to C++ :** History of C++ C++ basics (C++ tokens)- Keywords, identifiers, data types, variables, constants, operators, special symbols Types of Variables- Value, pointer and reference. Structure of C++ program Introduction to cin and cout objects. Function and its types Default value argument. Parameter passing methods. Static polymorphism (Function overloading)

		August	**Classes and Objects :** Introduction to class and object. Defining class (class specification) Creating object Access specifier (Visibility modes)- public, protected, private Class members- data members, member functions Non-member function Defining member function inside and outside the class. Inline function Static data members and static member functions Pointer to object Array of object Returning object Passing object as parameter by value, by pointer and 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 Destructor- Concept, characteristics of destructor. Constructor overloading 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.

		September	**Inheritance and Runtime Polymorphism:** Introduction and concept of inheritance 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 Pointer to base class. Pointer to derived class. Runtime polymorphism- Virtual functions- Definition, concept, characteristics and use of virtual function. Pure virtual function- Definition, concept, characteristics and use of pure virtual function. **Stream and Files:** Introduction to streams in C++ Stream classes File stream classes Formatted and unformatted I/O functions and Manipulators.

		October	File Manipulations- Opening, closing, reading, writing, appending File opening modes Opening files using open() and constructor Error handling during file manipulations Command line arguments **Exception Handling and Template:** Introduction to Exception Exception handling mechanism- try, catch, throw keywords. Custom exception. Introduction to Exception Introduction to class template Introduction to function template.

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B. Sc – (ECS)-II **Sem-III**	**Object Oriented Programming** **Using C++**	**July**	**Introduction to Object-Oriented-Programming:** Comparison with Procedure Oriented programming, Object oriented Programming paradigm, Basic concepts of object oriented programming, Benefits of OOP, object oriented Languages, Applications of OOP. **Introduction to C++:** Tokens, Keywords, Identifiers and constants, Basic Data types, User defined data types, Derived data types, symbolic constants, Type compatibility, Declaration of variables, Dynamic initialization of variables,reference variables, operators & Expressions in C++, Scope resolution operator,member dereferencing operators, Memory management operators, Type casting, Control structures.
		August	**Introduction of function:-** The main function, Types of Functions, Function prototyping, parameter passing technique, Inline functions, Default arguments, **Function Overloading.** Classes and Objects: - Structures in C++, specifying a class, Access specifires,Defining member functions, making an outside function inline, nesting of member functions, Private member functions, Memory allocation for the objects, Static data members. Static member functions, Array of objects, objects as Function arguments, Friend functions, Returning objects, Constant member functions, Local classes.

		September	**Constructors &Destructors:-** Types of Constructors, Multiple Constructors in a class, Constructors with default arguments, Dynamic initialization of objects,Constructing two Dimensional Arrays, Const Objects, Destructors. **Operator overloading and Type Conversions:** Introduction, Defining operator overloading, Overloading Unary and Binary operators, Manipulation of string using operators, Rules for Overloading operators, Type Conversion. **Polymorphism:** Introduction, Pointers to objects, *this* pointer, Pointer to derived classes, virtual functions, pure virtual functions, virtual destructor.
		October	**Inheritance:** Extending classes, Introduction, Defining derived classes, Single Inheritance, Making private member Inheritable, Multilevel Inheritance,Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual base classes, Abstract classes, Constructors in derived classes, Member classes: Nesting of classes, Pointers, virtual functions **Managing Console I/O Operations:** Introduction, C++ stream classes,Unformatted I/O Operations, Managing output with manipulators, Working With Files, classes for file stream operations, Opening and closing a file, Detecting end of file, File modes, file pointers and their manipulations, sequential input and output operations, Random access, Error handling During file Operations, Command-Line Arguments.

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BCA–III Sem-V	**Computer Graphics**	**July**	**Introduction** – applications of computer graphics, operations of computer graphics, graphics software packages. **Graphical input – output devices**- graphical input devices, graphical output devices, raster scan video principles- raster scan monitors, color raster scan systems, plasma panel display, LCD panels, hard copy raster devices. Random scan devices- monitor tube displays, plotters.
		August	**2D geometrical transformations** – basic transformations- translation, rotation, scaling, homogeneous co-ordinate system – transformations in homogeneous notation, inverse of basic transformations, scaling about a reference point, rotation about an arbitrary point. Other transformations – reflection about any arbitrary line, shearing, combined transformation- computational efficiency, visual reality, inverse of combines 'transformations. **3D geometrical transformations**- basic 3D transformation- 3D translation, 3D scaling. 3D rotation, rotation about an arbitrary axis in space, other 3D transformations- 3D reflection, reflection about any arbitrary plane, 3D shearing

		September	**Scan conversion** – scan conversion methods, polynomial method for line,polynomial method for circle, DDA algorithm for line, circle and ellipse,Bresenham‘s algorithm for line drwing and circle. Midpoint methods for line and circle, problems of scan conversion. **Scan conversion for solids**- solid areas or polygons, inside-outside test – odd even method, winding number method. Solid area filling algorithms- boundary fill algorithm, scan line fill algorithm, scan line seed fill algorithm, ordered edge list algorithm.
		October	**Projection** – introduction, parallel projection-orthographic projection,axonometric projection, oblique projection, perspective projection – standard perspective projection, vanishing points. Image formation inside a camera. **2D viewing and clipping**- windows and viewports, viewing transformation,clipping of lines in 2D-cohen-sutherland clipping algorithm, midpoint subdivision method, polygon clipping – Sutherland – hogman polygon clipping.

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B.C.A-II **Sem- IV**	**Advanced Web Technology**	**December**	**Introduction and Basics of PHP:** History of PHP PHP is better than Its alternatives Interfaces to External systems Hardware and Software requirements Benefits of PHP as a server side languages How PHP works with the web server Installation and Configuration files PHP Framework Basic PHP syntax PHP data types Displaying type information Testing for specific data type Changing type with Set type Operators Variable manipulation Dynamic variables Static vs. Dynamic Optimization Redirecting web pages Control Structures

		January	**Array, String and Functions:** Array: String: Functions: **Object Oriented Programming in PHP:** Object oriented concepts Define a class and objects Class attributes Object properties Object methods constructors and destructors Class constants
		February	Static method inheritance Abstract classes Exception Handling Final keyword Implementing Interface Object serialization Understanding Advance and New Checking for class and method existence **Working With Forms and Database (MySQL):** Working With Forms: Forms Forms controls properties, methods and events Retrieving form data with $_POST, $_GET and $_REQUEST arrays Validating retrieved data Strategies for handling invalid input Super global variables Super global array Importing user input Accessing user input Combine HTML and PHP code Using hidden fields Redirecting the user File upload and scripts Validation

		March	Working with Database MySQL: History of MySQL Installation and Up gradation to MYSQL MySQL Architecture Invoking MySQL through Command Line MySQL Server Start and Stop Overview of Data Types in MySQL Defining a Database Creating Tables and Fields in MySQL Working with PHP-MySQL Environment Connecting to the MYSQL Selecting a database Adding data to a table Displaying returned data on Web pages Finding the number of rows Inserting, deleting and updating data Executing multiple queries **State Management:** Cookies: Session:

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B.Sc.(ECS)-II **Sem- IV**	**Computer Graphics**	**December**	Basics Concept in Computer Graphics Introduction to Computer Graphics, Application of Computer Graphics, Classification of Computer Graphics, Types of Graphics Devices, Video Display Devices, Input Devices, Display File and its Structure, Display file Interpreter, Display Processor, Graphics file Format. Graphics in C:
		January	Introduction to graphics in C : initgraph(), detectgraph() and closegraph() function, Drawing object in C , Line, Circle, Rectangle, Ellipse, Changing foreground & background colors, Filling object by color function., drawpoly, fillpoly, floodfill, getcolor, settext, outtext, style, fonts, coloring.
		February	2-D Transformation Translation, Rotation, Scaling, Homogenous Coordinates for Translation, Homogenous Coordinates for Rotation, Homogenous Coordinates for Scaling, Composogation from 2D Transformation, Other Transformation Reflection, Shear, and Inverse Transformation.

		March	Line, Circle and Character Generation Basics concept in line Drawing, Line Drawing Algorithm, Digital Differential Analyzer, Bresenham's Line Algorithm, Antialiasing of Lines, Method of Antialiasing, Increasing Resolution, Unweighted Area Sampling, Pixel Phasing, Representation of Circle ,Polynomial Method, Trigonometric Method, Circle Drawing Algorithm, DDA Circle Drawing Algorithm, Bresenham's Circle Drawing Algorithm, Character Generation, Stroke Method, Starbust Method, Bitmap Method.

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