

Maharashtra State Board of Technical Education, Mumbai

TEACHING PLAN (TP-TH)/ Course Information Sheet (CIS)

K-1

Academic Year: 2026-27

Date: 10/07/2026

Institute Name: K. K. Wagh Polytechnic, Nashik

MSBTE Code: 0078

Program and Code: Computer Technology (CM)

Course Code & Abbr.: 313316 (OOP)

Course Name: Object Oriented Programming using C++(OOP)

Name of Faculty: Mrs.S.S.Gaikwad

Class: SYCM-Mac **Semester:** 3rd **Scheme:** K

Course Index: CI304 **Learning Hrs:** 48

● Teaching-Learning & Assessment Scheme:

Course Title	Course Code / Abbr	Course Category	Learning Scheme						Credits	TH Paper Duration (Hrs.)	Assessment Scheme										Total Marks
			Actual Contact Hrs/Week			SLH	NLH	Theory				Based on LL & TSL Practical				Based on SL					
			CL	TL	LL			FA TH			SA TH	Total		FA-PR		SA-PR		SLA			
												Max	Min	Max	Min	Max	Min	Max	Min		
OBJECT ORIENTED PROGRAMMING USING C++	313316/OOP	SEC	3	2	4	1	10	5	3	30	70	100	40	50	20	25@	10	25	10	200	

Abbreviations: CL- Class Room Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS – Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination, @\$ Internal Online Examination

● Course Outcomes (COs): Theory & Practical

By learning course Object Oriented Programming using C++(OOP-313316), the Second Year students will be able to:

CO No.	TLO No.	Course Outcomes (COs) / Theory Learning Outcomes (TLOs)
CO304.1 (CO1)	Write C++ programs using classes and objects.	
	TLO 1.1	Compare POP vs OOP approach of programming.
	TLO 1.2	Describe the different features of Object Oriented Programming
	TLO 1.3	Write programs to solve arithmetic expressions.
	TLO 1.4	Write programs to demonstrate use of special operators in C++.
	TLO 1.5	Develop C++ program to show the use of Classes and Objects.
CO304.2 (CO2)	Develop C++ programs using constructors	
	TLO 2.1	Develop a program using inline function.
	TLO 2.2	Develop friend function to solve given problem.
	TLO 2.3	Write C++ programs using array of objects.
	TLO 2.4	Write C++ program to initialize the object using constructor
	TLO 2.5	Write C++ program to delete object using destructor.
CO304.3 (CO3)	Implement Inheritance in C++.	
	TLO 3.1	Explain the given type of inheritance based on its characteristics.
	TLO 3.2	Implement given type of inheritance in C++ program
	TLO 3.3	Write C++ program using virtual base class.
	TLO 3.4	Use constructor in given derived class.
CO304.4 (CO4)	Implement Polymorphism in C++.	
	TLO 4.1	Create C++ program to perform given arithmetic operations using pointers
	TLO 4.2	Use 'pointer to object' to solve the given problem.
	TLO 4.3	Use compile time polymorphism to solve the given problem
	TLO 4.4	Use run time polymorphism to solve the given problem.
CO304.5 (CO5)	Develop C++ programs to perform file operations.	
	TLO 5.1	Identify relevant class to perform the given file operations.
	TLO 5.2	Describe different file modes.
	TLO 5.3	Develop C++ program to perform read/write operations from/to the given file

● **Teaching Plan:**

Unit No. (Allotted Hrs. & Marks)	COs & TLOs	Unit Title with Topic Details/Contents	Plan Dates (From-To & No. of Lectures)	Actual Executio n (From- To & No. of Lectures)	Teaching Method/ Media	Remark
01 (08) (12)	CO1 TLO- 1.1 1.2 1.3 1.4 1.5	Unit-1 Principles of Object Oriented Programming 1.0 Overview of the Course, Prerequisites, Scope, Skills, Career & Opportunities, MNCs 1.1 Procedure Oriented Programming (POP) verses Object Oriented Programming (OOP) 1.2 Features of Object Oriented Programming, Examples of Object Oriented languages, Applications of OOP. 1.3 Data types, Type compatibility, Declaration of variable, Dynamic initialization of variable, Reference variable, Type casting 1.4 Special Operators in C++: Scope resolution operator	01/07/2026 To 13/07/2026 (04) (01 Ex)		Chalk-Board, LCD+PPTs, MKCL ERA, TurboC++ Editor	
		1.5 Memory management operators, Manipulators 1.6 Structure of C++ program, Basic Input /Output operators and functions in C++, Simple C++ Program 1.7 Class & Object: Introduction, Specifying a class, Access specifiers 1.8 Defining member functions: Inside class and Outside class, Creating objects, Memory allocations for objects	14/07/2026 To 20/07/2026 (04)		Chalk-Board, LCD+PPTs, MKCL ERA, YouTube Videos	
02. (12) (16)	CO2 TLO- 2.1 2.2 2.3 2.4 2.5	Unit-2 Functions and Constructors 2.1 Inline function, Static data members 2.2 Static member function 2.3 Friend function: Using two different classes , Using non-member function 2.4 Array of Objects	2/07/2026 To 03/08/2026 (04)		Chalk-Board, LCD+PPTs, TurboC++ Editor	
		2.5 Object as function arguments 2.6 Concepts of Constructors 2.7 Types of constructors 2.8 Constructor overloading	07/08/2026 To 10/08/2026 (04)		Chalk-Board, LCD+PPTs, TurboC++ Editor	
		2.9 Constructor overloading 2.10 Constructors with default arguments 2.11 Destructors 2.12 Destructors with Example	14/08/2026 To 17/08/2026 (04)		Chalk-Board, LCD+PPTs, TurboC++ Editor	
03. (09) (16)	CO3 TLO- 3.1 3.2 3.3 3.4	Unit 3 Extending classes using Inheritance 3.1 Introduction to Inheritance 3.2 Defining a derived class 3.3 Visibility modes and effects	22/08/2026 To 24/07/2026 (03)		Chalk-Board, LCD+PPTs, TurboC++ Editor	
		3.4 Types of Inheritance : Single Inheritance 3.5 Multilevel, Multiple Inheritance 3.6 Hierarchical, Hybrid Inheritance	29/08/2026 To 31/08/2026 (03)		Chalk-Board, LCD+PPTs, TurboC++ Editor	
		3.7 Virtual base class, 3.8 Abstract class 3.9 Constructor in derived class	05/09/2026 To 07/09/2026 (03)		Chalk-Board, LCD+PPTs, TurboC++ Editor	

04. (10) (16)	CO4 TLO- 4.1 4.2 4.3 4.4	Unit 4 Pointers and Polymorphism in C++ 4.1 Concept of Pointer: Pointer declaration 4.2 Pointer operator, Address operator, Pointer arithmetic 4.3 Pointer to Object: Pointer to object 4.4 'this' pointer	11/09/2026 To 14/09/2026 (04)		Chalk-Board, LCD+PPTs, TurboC++ Editor MKCL ERA	
		4.5 Pointer to derived class 4.6 Introduction of Polymorphism 4.7 Types of polymorphism , Compile time Polymorphism: Function overloading	19/09/2026 To 21/09/2026 (03)		Chalk-Board, LCD+PPTs, TurboC++ Editor	
		4.8 Revision of constructor overloading, Operator overloading: Rules for operator overloading 4.9 Overloading of unary and binary operators 4.10 Run time polymorphism: Virtual function 4.11 Rules for virtual function, Pure virtual function	26/09/2026 To 30/09/2026 (03) (01 Ex)		Chalk-Board, LCD+PPTs, TurboC++ Editor	
05. (06) (10)	CO5 TLO- 5.1 5.2 5.3	Unit 5 File operations 5.1 C++ stream classes, Classes for file stream operations 5.2 Detection of end of file 5.3 File modes with Example	03/10/2026 To 05/10/2026 (03)		Chalk-Board, LCD+PPTs, TurboC++ Editor	
		5.4 Opening files: Using constructors and open() 5.5 Closing files, Reading from and writing to files 5.6Formatted Input/output functions in file 5.7 Types of file: Random access, Sequential access	10/10/2026 To 14/10/2026 (03) (01 Ex)		Chalk-Board, LCD+PPTs, TurboC++ Editor MKCL ERA	
		Total	48 Hrs.			

• Chapter wise CO-PO Mapping:

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes PSOs	
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PSO-1	PSO-2
CO1	2	1	1	2	1	1	1	2	1
CO2	2	1	1	2	1	1	1	2	2
CO3	2	2	2	2	2	2	1	2	1
CO4	2	2	2	2	2	2	1	2	1
CO5	2	2	2	2	2	2	1	2	2

- **Legends:-** High:03, Medium:02, Low:01, -- :No Mapping

Sr. No.	Programme Outcomes (POs)	Programme Specific Outcomes (PSOs)
1.	PO-1 Basic and Discipline Specific Knowledge	PSO1 Apply acquired skills of programming, networking, hardware & database for computer based problem solving and software development.
2.	PO-2 Problem Analysis	
3.	PO-3 Design/ Development of Solution	
4.	PO-4 Engineering Tools	
5.	PO-5 Engineering Practices for Society, Sustainability and Environment	PSO-2 Pursue higher studies in the field of Computer Science / Computer Engineering /Information Technology.
6.	PO-6 Project Management	
7.	PO-7 Life Long Learning	

● Weightage to Learning Efforts & Assessment Purpose (Specification Table)

Unit No.	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	Principles of Object Oriented	CO1	8	2	4	6	12
2	Functions and Constructors	CO2	12	2	4	10	16
3	Extending classes using	CO3	9	2	4	10	16
4	Pointers and Polymorphism in	CO4	10	2	4	10	16
5	Database Administration	CO5	6	0	4	6	10
6	File operations	Total :	45	8	20	42	70

Learning Levels with reference to Bloom's Taxonomy: R Level: Remember, U Level: Understand, A-Level: Apply

● Formative & Summative Assessment Criteria:

■ Theory Assessment:

a) Formative assessment (FA-TH) :

- Two offline class tests each of 30 marks will be conducted as per MSBTE guidelines. The average of two class test marks will be consider for final FA-TH(Average) out of 30 marks.

b) Summative Assessment (SA-TH) :

- The comprehensive End semester assessment will be done by MSBTE by a Theory written Examination for 70 marks. Question Paper and Assessment is performed by MSBTE.
- Final Theory Score out of 100 Marks will be derived as the total score as below:

$$SA-TH [out of 70] + FA-TH [Average out of 30] = 100 \text{ Marks}$$

■ Practical Assessment:

- Formative Assessment (FA) of each practical/experiment will be performed progressively for 50 marks. The assessment will be performed based on the Regularity in Practical Performance, Tool Selection Ability, Use of Appropriate tool to perform the Identified tasks, Algorithm/Solution developed, Quality of output achieved, Answer to sample questions and Submit report in total time.
- Final Term Work (FA-PR) of 50 marks is calculated based on scores in Formative Assessment for all practical's/experiments as:

$$\text{Term Work Marks} = \text{Sum of Total Marks Scored in FA} / (50 \times \text{Total Number of Experiments}) \times 50$$
- A Summative (comprehensive) Assessment (SA-PR) of Practical will be performed as End Semester Examination (ESE). The SA-PR will be for 50 Marks with MSBTE guidelines at the end of semester. The schedule of MSBTE Practical ESE will be display on Notice board prior to examination.

■ Self Learning Assessment:

- Self-learning Activities (SLA) includes Micro project / Assignment / other activities related to subject/course and it will be evaluated out of 25 Marks.

● References :

1. Suggested Books for Reference:

Sr. No	Author	Title of the Book	Publisher
1.	E Balaguruswamy	Object Oriented Programming with C++	McGraw-Hill Education ISBN-10:0070669074, ISBN13:9780070669079
2.	D Ravichandran	Programming with C++	McGraw-Hill Education ISBN-10: 0070681899, ISBN13: 978-0070681897
3.	Stroustrup B.	The C++ Programming Language	McGraw Hill Education ISBN 10:0070591199
4.	Robert Lafore	Object Oriented Programming in C++	Pearson Education India ISBN-10: 8131722821, ISBN13: 978-8131722824
5.	John R Hubbard	Programming with C++	Tata McGraw-Hill
6.	Yashwant Kanetkar	Let us C++	BPB Publication
7.	Terrence W. Pratt	Programming Languages	PHI Publication

2. Learning Websites & Portals:

Sr. No	Website /Portal Link/URL	Description
1	https://www.w3schools.com/cpp/	C++ Tutorial for all topics
2	https://www.javatpoint.com/cpp-tutorial	C++ Tutorial for all topics
3	https://www.javatpoint.com/cpp-files-and-streams	C++ File Streams
4	https://www.programiz.com/cpp-programming	Inheritance in C++
5	https://www.programiz.com/cpp-programming/online-compiler/	Online Compiler for C++
6	https://www.onlinegdb.com/online_c++_compiler	Online compiler for C++

3. URLs of referred YouTube Videos:

Sr. No	Website /Portal Link/URL	Description
1	https://youtu.be/z_jD2KkjHS4	Procedure and object oriented Programming
2	https://youtu.be/LZ9P4vP4Ymc	Introduction to Object Oriented Programming
3	https://youtu.be/9jbF8EyrT2U	Decision Making Statements in C++
4	https://youtu.be/a7Wim2t053E	C++ Reference Variables & Typecasting
5	https://youtu.be/hAA8FBq2bA4	Constructors & Destructors in C++
6	https://youtu.be/QcLI2zGVYFo	Static Data Member
7	https://youtu.be/7ZfEp71tlec	Inheritance in OOP's
8	https://youtu.be/JU8DbwBvOWE	Virtual Functions & Abstract Classes
9	https://youtu.be/fBIM7pR2r_Q	Introduction to pointer
10	https://youtu.be/uc_Hr10cBBE	Polymorphism in C++
11	https://youtu.be/ULp4eSHL3SM	Unary Operator Overloading
12	https://youtu.be/b3rmSbqpevk	Increment and Decrement Operator

4. Self Prepared Video URLs:

Sr. No	Website /Portal Link/URL	Description
1	https://youtu.be/GN3DMPSo4SE	Polymorphism
2	https://youtu.be/_Qm_1zIL1Hc	File Operation
3	https://youtu.be/UVz23dU_XTc	Inheritance
4	https://youtu.be/zxuugw73yCw	Constructor and Destructor
5	https://youtu.be/r9H0EoXvHC0	Constructor and Destructor
6	https://youtu.be/OrqtMUfAm6g	Array of Object
7	https://youtu.be/AOSFMWg6Qek	Function Definition inside and outside a class
8	https://youtu.be/h3v1nINYliA	Static member Function
9	https://youtu.be/ZGWJB2UBmSc	Static member Variable
10	https://youtu.be/i1bqRNoZMY0	Memory Allocation for Object
11	https://youtu.be/Zb5KmtVr5ew	Concept of OOP

5. Tools to Use for Teaching-Learning, Assessment and Evaluation:

1. TurboC++ – Turbo C++ was a software development tool for writing programs in the C++ language.
2. Google Classroom – Google class room used to share the notes with students, to give some assignments and we also assess it through google classroom..
3. MKCL LMS Era – Google class room used to share the notes with students, to give some assignments, Quiz ,enotes through MKCL LMS Era.

Mrs.S.S.Gaikwad
(Faculty Name & signature)

Mr.A.D.Talole
CIAAN Cordinator

Prof. M.P.Bhosale
(HOD-Computer Tech. Dept.)

CC-

1. OOP - 313316 Course File

2. Notice Board / ERP

3.Institute Website / CIAAN Coordinator

