

GOVERNMENT POLYTECHNIC, NAGPUR.

(An Autonomous Institute of Govt. of Maharashtra)

COURSE CURRICULUM

PROGRAMME	: DIPLOMA IN COMPUTER ENGG / INFORMATION TECHNOLOGY.
LEVEL NAME	: PROFESSIONAL COURSES
COURSE CODE	: CM402E
COURSE TITLE	: Object Oriented Programming
PREREQUISITE	: CM401E
TEACHING SCHEME	: TH:03; TU:00; PR:04(CLOCK HRs.)
TOTAL CREDITS	: 05(3 TH/TU CREDIT = 3 CLOCK HR., 2 PR CREDIT = 1 CLOCK HR.)

❖ RATIONALE:

Engineering students must be able to use basics of programming in real time environment. This course increases student's ability towards problem solving and logic development for real world problems. It also describes basics of programming using C++ programming language. C++ is the most commonly used object oriented language. It is very important course for understanding and acquires higher level knowledge in the field of software engineering and learning advanced object oriented languages.

❖ COURSE OUTCOMES:

After completing this course students will be able to–

1. Analyze the solutions for real world problems.
2. Select and use appropriate statements, functions, and data structures available in C++, as required
3. Understand various concepts available in C++.
4. Apply concept of object oriented programming for real time problems.
5. Write and execute programs in C++.
6. Debug and test the programs in C++.

❖ **COURSE DETAILS:**

A. THEORY :

Units	Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
1. Fundamental s of programming	1. Define / Explain various OOP's basic concepts . 2. Differentiate between OOP and POP 3. Describe structure of C++ program.	1.1 Its need & requirement, Procedure Oriented Programming (POP) verses Object Oriented Programming (OOP), 1.2 Basic concepts of Object Oriented Programming, Object Oriented Languages, Applications of OOP. 1.3 Beginning with C++: What is C++? , keywords, variables, constants, basic data types, 1.4 Operators, scope resolution operator, memory management operators, console input/output, structure of C++ program.	6
2. Basic of Classes & Objects	1. Define classes and objects 2. Write programs on classes and objects 3. Declare and define static data members, member functions 4. Define friend functions and write programs for it.	2.1 Structures in C++. 2.2 Class & Object: Introduction, specifying a class, access specifiers, defining member functions, creating Objects, memory allocation for objects. 2.3 Array of Objects, Object as function arguments. 2.4 Static data members, static member function, friend Function	8
3. Constructors , Destructors, Inheritance	1. Define constructors and destructors, types of constructors. 2. Programs based on constructors and destructors. 3. Define inheritance and its types. 4. State visibility modes. 5. Write program based on inheritance.	3.1 Concepts of Constructors, Types of constructors: Default, Parameterized, Copy. 3.2 Overloaded Constructors :Multiple Constructors in a Class, Constructors with default arguments. 3.3 Destructors. 3.4 Introduction to derived class, visibility modes & effects 3.5 Types of Inheritance : single, multilevel, multiple, hierarchical , hybrid 3.6 Constructors in derived class.	12
4. Pointers in C++	1. Define pointer 2. Enlist pointer arithmetic statements 3. State pointer to array, string and objects. 4. Define this pointer	4.1 Concepts of Pointer: Pointer declaration, Pointer operator, address operator, Pointer arithmetic. 4.2 Pointer to Array: Searching, Insertion, deletion 4.3 Pointer to String: Searching, finding length, comparisons, concatenation, reverse 4.4 Pointer to Object: Pointer to Object, this pointer, Pointer to derived class, virtual function	6

Units	Specific Learning Outcomes (Cognitive Domain)	Topics and subtopics	Hrs.
5. Polymorphism	1. Define polymorphism 2. Define types of polymorphism 3. Write programs over polymorphism	5.1 Introduction, Types of polymorphism: Compile time, Run time 5.2 Compile time Polymorphism: Function overloading, operator overloading: Overloading unary and binary operators, Rules for Operator overloading. 5.3 Run time polymorphism: Virtual functions, rules for virtual Functions, pure virtual function.	8
6. Working with files	1. Define various file operations 2. Define various files opening modes 3. State movement of pointer throughout file 4. Write program over files	6.1 Introduction 6.2 Classes for File Stream Operations 6.3 Opening and closing a file, detecting end of file 6.4 File Modes 6.5 File pointers and their manipulations 6.6 Sequential input and output operation 6.7 Updating a File: Random Access 6.8 Error handling during file operations 6.9 Command Line Arguments	8
Total Hrs.			48

B. LIST OF PRACTICALS/LABORATORY EXPERIENCES/ASSIGNMENTS:**(Note: Perform all practicals in Windows/LINUX environment)**

Practical	Specific Learning Outcomes (Psychomotor Domain)	Units	Hrs.
1.	Write and execute two simple C++ programs based on object and classes.	Fundamental of programming	4
2	Write and execute two programs based on default argument concept in function.	Classes and objects,	2
3	Write and execute two programs based on function overloading.		2
4	Write and execute two programs on static member function.		2
5	Write and execute two programs using friend function		2
6	Write and execute two programs based on constructor, destructor and dynamic constructor.	Constructor and destructor	4
7	Write and execute two programs over constructor overloading		2
8	Write and execute five programs for all types inheritance	Inheritance	4
9	Write and execute a program to pass parameters from derived class constructor to base class constructor		2
10	Write and execute two programs to create a pointer for object and array of objects.	Pointer	2
11	Write and execute program for virtual function.		2
12	Write and execute program for function overloading	Polymorphism	2
13	Write and execute two simple programs on unary operator overloading.		2
14	Write and execute two simple programs on binary operator overloading.		2
15	Write and execute two simple programs to perform various operations over files	Working with files	2
16	Write and execute two simple programs to randomly access contents of file		2
17	Write and execute a simple program using command line argument		2
18	Mini project based on above concepts		6

❖ SPECIFICATION TABLE FOR THEORY PAPER:

R – Remember

U – Understand

A – Analyze / Apply

Unit No.	Units	Levels from Cognition Process Dimension			Total Marks
		R	U	A	
01	Fundamentals of programming	04(04)	02(00)	00(00)	06(04)
02	Basic of classes and objects	04(02)	08(04)	00(00)	12(06)
03	Constructor , Destructor and Inheritance	02(00)	08(04)	06(06)	16(10)
04	Pointers in c++	02(02)	08(04)	00(00)	10(06)
05	Polymorphism	02(02)	06(06)	06(00)	14(08)
06	Working with files	02(02)	04(04)	06(00)	12(06)
	Total	16(12)	36(22)	18 (06)	70 (40)

❖ QUESTION PAPER PROFILE FOR THEORY PAPER:

Q. No	Bit 1			Bit 2			Bit 3			Bit 4			Bit 5			Bit 6			option
	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	T	L	M	
01	1	R	2	2	R	2	1	R	2	2	R	2	3	R	2	4	R	2	5/7
	5	R	2																
02	1	R	4	2	U	4	3	U	4	4	U	4	5	U	4				3/5
03	2	R	4	3	U	4	3	U	4	4	U	4	6	U	4				3/5
04	4	U	4	3	U	4	4	U	4	5	R	4	6	U	4				3/5
05	2	A	6	5	U	6	6	A	6										2/3
06	5	A	6	6	A	6	3	A	6										2/3

T= Unit/Topic Number

L= Level of Question

M= Marks

R-Remember

U-Understand

A-Analyze/ Apply

❖ ASSESSMENT AND EVALUATION SCHEME :

	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	(Term End TEE(Continuous Assessment)CA Examination)	PT	Students	Two PT (average of two tests will be computed)	20	--	Theory Answer Scripts	1, 2, 3, 4
		Class Room Assignments		Assignments	10	--	Assignment copy	1, 2, 3, 4
				TOTAL	30	12		
	(Term End TEE(Continuous Assessment)CA Examination)	End Exam	Students	End Of the Course	70	28	Theory Answer Scripts	1, 2, 3, 4
Direct Assessment Practical	(Term End TEE(Continuous Assessment)CA Examination)	ST	Students	One skill test at end of term	20	--	Practical Answer Scripts / Printout	1, 2, 3, 4
		Journal Writing		Assignments	05	--	Journal	1, 2, 3, 4
				TOTAL	25	10		
	(Term End TEE(Continuous Assessment)CA Examination)	End Exam	Students	End Of the Course	50	20	Practical Answer Scripts / Printout	1, 2, 3, 4

Indirect Assessment	Student Feedback on course	Students	After First PT	Student Feedback Form	1, 2, 3, 4
	End Of Course Survey		End Of The Course	Questionnaires	

❖ **SCHEME OF PRACTICAL EVALUATION:**

S.N.	Description	Max. Marks
1	Writing program and Drawing flow chart	20
2	Execution of program	20
3	Viva voce	10
	TOTAL	50

❖ **MAPPING COURSE OUTCOMES WITH PROGRAM OUTCOMES:**

Course Outcomes	Program Outcomes (Pos)									
	1	2	3	4	5	6	7	8	9	10
1	3	3	3	2	2	2	2	2	1	3
2	2	3	3	3	2	1	1	2	1	2
3	3	3	3	2	2	1	1	2	1	2
4	3	3	3	3	2	1	1	2	1	2
5	3	3	3	3	2	2	2	2	1	3
6	3	3	3	3	2	2	2	2	1	3

❖ **REFERENCE & TEXT BOOKS:**

S.N.	Title	Author, Publisher, Edition and Year Of publication	ISBN Number
1.	Object oriented programming with c++	E. Balagurusamy , Publication Mc graw Hill Education , 4 th	ISBN-13, 9781259004612

		Edition	
2.	Let us C++	Yashwant Kanetkar BPB Publication , 2 nd Edition	ISBN-13, 9788183331630
3	Object oriented programming in c++	Robert Lafore, SAMS publication, 4 th edition	
4	Object oriented programming in c++	Lekhraj Vilhekar, Icebreakers publication, 1 st edition	

❖ **E-REFERENCES:**

www.cprogramming.com/tutorial/c++-tutorial.html

www.tutorialspoint.com/cplusplus/cpp_tutorial.pdf

www.tutorialspoint.com/cplusplus/cpp_pdf_version.htm

<http://www.w3schools.org.in> accessed on 30th March 2016

❖ **LIST OF MAJOR EQUIPMENTS/INSTRUMENTS WITH SPECIFICATION**

1. Computer (Dual Core or above)
2. Network printer.
3. TCP/GCC compiler

❖ **LIST OF EXPERTS & TEACHERS WHO CONTRIBUTED FOR THIS CURRICULUM:**

S.N.	Name	Designation	Institute / Industry
1.	Lekhraj D. Vilhekar	Lecturer in Information Technology	Government Polytechnic, Nagpur.
2.	S. N. Chaudhary	Lecturer in Computer Engineering	Government Polytechnic, Nagpur.
3	G. B. Chavan	Lecturer in Computer Engineering	Government Polytechnic, Nagpur.
4	Shri. Atul Upadhyay	CEO	Vista Computers , Ram Nagar, Nagpur
5	Shri. N. V. Chaudhari	Asst. Professor (CSE)	DBACEO, Wanadongri, Nagpur
6	Shri. Manoj Jethawa	HOD Computer Science	Shri Datta Meghe Polytechnic, Nagpur

(Member Secretary PBOS)

(Chairman PBOS)