Course Code	USA20201J	Course Name	OBJECT ORIENTED PROGRAMMING	Course Category	C	Professional Core Course	L	T	C	P
							4	0	4	6

Pre-requisite Courses	Nil	Co-requisite Courses	Nil	Progressive Courses	Nil
Course Offering Department	Computer Applications		Data Book / Codes/Standards	Nil	

Course Learning Rationale (CLR):	The purpose of learning this course is to:
CLR-1 :	Utilize class and build domain model for real-time programs
CLR-2 :	Utilize method overloading and operator overloading for real-time application development programs
CLR-3 :	Utilize inline, friend and virtual functions and create application development programs
CLR-4 :	Utilize exceptional handling and collections for real-time object oriented programming applications
CLR-5 :	Create programs using object oriented approach and design methodologies for real-time application development

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Learning			Program Learning Outcomes (PLO)														
		1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
		Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)	Fundamental Knowledge	Application of Concepts	Link with Related Disciplines	Procedural Knowledge	Skills in Specialization	Ability to Utilize Knowledge	Skills in Modeling	Analyze, Interpret Data	Investigative Skills	Problem Solving Skills	Communication Skills	Analytical Skills	ICT Skills	Professional Behavior	Life Long Learning
CLO-1 :	Identify the class and build domain model	3	80	70	H	H	M	-	-	-	-	-	H	H	-	-	M	H	H
CLO-2 :	Construct programs using method overloading and operator overloading	3	85	75	H	H	H	H	H	-	M	-	H	H	-	-	M	H	H
CLO-3 :	Create programs using inline, friend and virtual functions, construct programs using standard templates	3	75	70	H	H	M	H	H	-	M	-	H	H	-	-	M	H	H
CLO-4 :	Construct programs using exceptional handling and collections	3	85	80	H	H	H	-	-	-	-	-	H	M	-	-	M	H	H
CLO-5 :	Construct programs using object oriented concepts	3	85	75	H	M	M	M	M	M	M	-	H	H	-	M	M	H	H
CLO-6 :	Create applications based on real world scenarios	3	80	70	H	H	M	-	-	-	-	-	H	H	-	-	M	H	H

Duration (hour)		24	24	24	24	24
S-1	SLO-1	Comparison of Procedural and Object Oriented Programming	Constructor Types: Default and Parameterized constructor	Inheritance and its types	Introduction to Files	Templates : Introduction
	SLO-2	List of OOPS languages and its features	Example Programs	Inheritance: Single	Classes For File Stream Operations	
S-2	SLO-1	Features: Classes, Objects, Inheritance, Polymorphism, Encapsulation	Constructor Types: Copy and Static, Private.	Inheritance: Multiple	Types of files	Types of templates
	SLO-2	Data Hiding, Message Passing, Reusability	Example Programs	Example program	Opening and Closing a File	
S-3	SLO-1	I/O Operations, Data Types	Destructor	Inheritance: Multilevel	Example Program	Class Templates
	SLO-2	Variables, Constants and Type Conversion	Static Data members	Example program	Detecting End Of File	Example for class templates
S4	SLO -1	Operators	Static member functions	Inheritance: Multiple	Example program	Function templates
	SLO -2	Special operators	Example program	Visibility of access specifier	Read and write functions- character and string	Example
S	SLO-1	Lab 1: I/O operations and operators	Lab 4: Parameterized Constructor and	*Lab 7: Inheritance*	Lab 10 : Simple file programs	Lab13 :Templates

5-8	SLO-2		Constructor Overloading			
S-9	SLO-1	Control Structures	Overloading Concept in OOP	Inheritance : Hierarchical	*File Open Modes*	Exceptional Handling: Types of exceptional handling
	SLO-2	Examples of Control Structures	Overloading types	*Example program*	*Example program*	Exceptional Handling :Try and Catch
S-10	SLO-1	Functions and types	Function Overloading: Different parameter with same data type	Inheritance : Hybrid	*Example Program*	Example program
	SLO-2	Function declaration and definition	Example Program	Example program	*File Pointer Manipulations*	Exceptional Handling : Standard exceptions
S-11	SLO-1	Passing arguments, returning values	Function Overloading: Different parameter with different argument types	Constructors and destructors in inheritance	*Example Program*	Example program
	SLO-2	default arguments, Constant arguments	Example Program	Example Program	*Sequential Input and Output Operations*	Exceptional Handling: Multilevel exceptional
S-12	SLO-1	Call by value , Call by reference	Function Overloading: Different parameter with different return values	Constructors and types of inheritance	*Functions to handle file pointer*	throw and throws
	SLO-2	Return by reference, Inline Functions	Example Program	Example program	*Example program*	Example program
S 13-16	SLO-1	Lab 2: Control structures and Functions	Lab 5 : Function Overloading	Lab 8 : Multiple ,Multilevel Inheritance	*Lab 11 : Working with files*	Lab 14 :Multilevel exceptional programs
	SLO-2					
S-17	SLO-1	Class and Objects	Operator Overloading Concept	Friend Function	Reading a class object	Exceptional Handling: finally
	SLO-2	Access specifier	Types of operator overloading	Virtual Base Classes	Example Program	User defined exceptions
S-18	SLO-1	Visibility of access specifier	Operator Overloading: Unary Operators	Example Program	Random Access –Updating a File	Programs for user defined exceptions
	SLO-2	Example program	Example program	Abstract Classes	Example program	Example program
S-19	SLO-1	Constructor	Operator Overloading: binary Operators	Example Program	Error Handling in File Operations	Exception Handling class
	SLO-2	Example program	Example program	Virtual Functions	Example program	Example program
S-20	SLO-1	Destructor	Operator Overloading: Assignment Operator	this pointer	Command Line Arguments	User defined exceptional class
	SLO-2	Example program	Example program	Inline functions	*Example Program*	Example Programs using CPP
S 21-24	SLO-1	Lab 3: Classes and Objects	Lab 6 : Operator Overloading	*Lab 9 : Abstract classes and Virtual Functions*	*Lab 12: command line arguments program*	Lab 15:User defined Exceptions and simple CPP application.
	SLO-2					

Learning Resources	1. *E Balagurusamy,(2017), "Object Oriented Programming in C++", 7th Edition, Tata McGraw Hill* 2. *ReemaThareja, (2015), "Object Oriented Programming with C++", 1st Edition, Oxford University Press* 3. *R S Salaria,(2016), "Mastering Object Oriented Systems Development Programming in C++", 6th Edition, Khanna Publishing*	4. Robert Lafore, (2008), "Object-Oriented Programming in C++", 4th Edition, SAMS Publishing 5. SouravSahay, (2017), "Object Oriented Programming with C++", 2nd Edition, Oxford University Press

Learning Assessment

Level	Bloom's Level of Thinking	Continuous Learning Assessment (50% weightage)								Final Examination (50% weightage)	
		CLA – 1 (10%)		CLA – 2 (10%)		CLA – 3 (20%)		CLA – 4 (10%) #			
		Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice	Theory	Practice
Level 1	Remember	20%	20%	15%	15%	15%	15%	15%	15%	15%	15%
	Understand										
Level 2	Apply	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
	Analyze										
Level 3	Evaluate	10%	10%	15%	15%	15%	15%	15%	15%	15%	15%
	Create										
	Total	100 %		100 %		100 %		100 %		100 %	

CLA – 4 can be from any combination of these: Assignments, Seminars, Tech Talks, Mini-Projects, Case-Studies, Self-Study, MOOCs, Certifications, Conf. Paper etc.,

Course Designers

Experts from Industry	Experts from Higher Technical Institutions	Internal Experts
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