

TECNIA INSTITUTE OF ADVANCED STUDIES
GRADE 'A' INSTITUTE
Department of Information Communication & Technology
COURSE PLAN
ACADEMIC SESSION 2024-25

As per Scheme of Examination & Syllabi for Bachelor of Computer Application Scheme & Syllabus (w.e.f Academic Session 2021-2022 onwards); Guru Gobind Singh Indraprastha University, New Delhi.

PROGRAMME CODE :	020	PROGRAMME :	Bachelor of Computer Applications (BCA)	SHIFT:	1st				L	3	T/P	1	Credits	4	
COURSE CODE :	BCA-205	COURSE NAME:	Object Oriented Programming using C++	SECTION:	A										
		COURSE TYPE:	Core Course Theory (CCT)	FACULTY:	Ms. Shikha Yadav										
LEARNING OBJECTIVES: The paper aims to understand the importance, limitations and challenges of processes involved in software development. In this course, the learners will be able to develop expertise related to the following: <ol style="list-style-type: none"> Gain knowledge and develop a broad understanding of bottom up approach Construct object oriented solutions for real world scenarios 															
PREREQUISITE: 1. Knowledge of C programming 2. Basic Programming Skills															
COURSE OUTCOME & MAPPING, COURSE ARTICULATION															
		COMMUNICATION SKILLS : The student should be able to communicate the technical information both orally and In writing professionally.	USE OF SOFTWARE TOOLS : Create, select, adapt and apply suitable tools and technologies to a wide range of computational activities.	TECHNICAL SKILLS : Acquire necessary knowledge of technical, scientific as well as basic managerial and financial procedures to analyze and solve real world problems within their work domain	DOMAIN AWARENESS : Clarity on both conceptual and application oriented skills In commerce, Finance & Accounting and it Applications in Business context.	TECHNICAL SUPPORT ; Must be able to provide technical support for various software applications	ANALYSIS AND INVESTIGATION OF COMPLEX COMPUTING PROBLEMS : Ability to analyze research and investigate complex computing problems through design of experiments, analysis and interpretation of data and synthesis of the information to arrive at valid conclusions.	DESIGN / DEVELOPMENT OF SOLUTIONS : Apply the knowledge gained In core courses to a broad range of advanced topics In computer science, to learn and develop sophisticated technical products independently.	IMBIBE CYBER ETHICS : Awareness on ethics, values, sustainability and creativity aspects of technical solutions.						
		COMMUNICATION SKILLS	USE OF SOFTWARE TOOLS	TECHNICAL SKILLS	DOMAIN AWARENESS	TECHNICAL SUPPORT	ANALYSIS AND INVESTIGATION OF COMPLEX COMPUTING PROBLEMS	DESIGN / DEVELOPMENT OF SOLUTIONS	IMBIBE CYBER ETHICS	BLOOM TAXONOMY					
CO - PO MAPPING		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	BT LEVEL					
CO1	Understand the basic principles of Object-Oriented Programming	3	3	3	3	2	2	1	2	BT12					
CO2	Apply OOPs principles using C++ constructs	1	2	3	1	3	1	1	1	BT13					
CO3	Develop expertise In classification hierarchies and polymorphism using C++	2	1	2	2	3	1	2	2	BT13					
CO4	Comprehend the working of files and generic programming	1	2	1	2	2	1	1	1	BT15					
Course Articulation (Average)		1.8	2.0	2.3	2.0	2.5	1.3	1.3	1.5						

Shikha Yadav

*Dr. Rakesh Kumar
(HOD-BCA)
HOD
BCA-TIAS*

S. No.	Lecture No.	Unit No.	Topic	Sessional Outcome	Experiential Learning	Participative Learning	Problem Solving Methodologies	ICT Tools & E-Resources Utilization	Mapping with CO	Class Material (PPT Faculty+ Students)	Additional Material	Mode of Assessment	Status
1	L1	1	Object Oriented Paradigm: Procedural vs. object-oriented development,	Student would be able to understand concept of oops		Lecture through PPT	Brainstorming	https://nptel.ac.in/courses/106105084	CO1	PPT	https://www.youtube.com/watch?v=YscEcXRmBoY	PPT (CIA)	
2	L2	1	Basic concepts of object-oriented programming	Understand the concept of related oops		Lecture through PPT		https://nptel.ac.in/courses/106105085	CO1, CO2	PPT	https://www.youtube.com/watch?v=YscEcXRmBoY	PPT (CIA)	
3	L3	1	Applications and benefits of OOP,, comparison between C and C++.	Understand the feature of oops		Lecture through PPT		https://nptel.ac.in/courses/106105086	CO2	PPT	https://www.youtube.com/watch?v=5UYFngKjsHQ	PPT (CIA)	
4	T1	1	Object Oriented Paradigm (Tutorial L1, L2 & L3)	Understand OOP	Discussion/ Doubt Clearing session			https://nptel.ac.in/courses/106105086	CO2		https://www.youtube.com/watch?v=5UYFngKjsHQ	PPT (CIA)	
5	L4	1	Beginning with C++: Stream based I/O	Understand the basic structure of oops programming	Flipped Classroom		Brainstorming	https://nptel.ac.in/courses/106105087	CO1, CO4	PPT	https://www.youtube.com/watch?v=QeQ26vn11bc	PPT (CIA)	
6	L5	1	Literals- constant qualifiers, operators in C++, reference variable	Learn about different application of oops	Flipped Classroom		Discussion	https://nptel.ac.in/courses/106105088	CO1	PPT	https://www.youtube.com/watch?v=RySS6ypa_B	Flipped Classroom	
7	L6	1	Functions, default arguments parameter passing by value, reference and pointer,	Understand the terms used to used oops programming		Lecture through PPT		https://nptel.ac.in/courses/106105084	CO2	PPT	https://www.youtube.com/watch?v=8G4u1pQc8	Questions from Assignment	
8	T2	1	C++, Variables & Functions(Tutorial L4, L5 & L6)	Understand C++, Variables & Functions	Discussion/ Doubt Clearing session			https://nptel.ac.in/courses/106105084	CO2		https://www.youtube.com/watch?v=5UYFngKjsHQ	Group Discussion	
9	L7	1	inline functions, s, type conversion, basic C++ programs	Understand the environment	Role Play on Entity Set			https://nptel.ac.in/courses/106105085	CO2, CO1	PPT	https://www.youtube.com/watch?v=B0Nxfp mkkS0	Group Discussion	
10	L8	1	New, delete operators- basic use, dynamic memory allocation for arrays.	Learn about different libraries used in c++		Lecture through PPT		https://nptel.ac.in/courses/106105086	CO1	PPT	https://www.youtube.com/watch?v=FFRR MEXdBU	PPT(CIA)	
11	L9	2	Classes and Objects: C++ class declaration	Learn about different libraries used in c++		Lecture through PPT	Practical	https://nptel.ac.in/courses/106105087	CO2	PPT	https://www.youtube.com/watch?v=FFRR MEXdBU	PPT(CIA)	
12	T3	2	Operators, arrays Classes & objects (Tutorial : L7, L8 & L9)	Understand the concept of Dynamic Allocation	Discussion/ Doubt Clearing session			https://nptel.ac.in/courses/106105087	CO2		https://www.youtube.com/watch?v=FFRR MEXdBU	Group Discussion	
13	L10	2	Access specifiers, member functions	Understand the concept of compiler		Lecture through PPT	Practical	https://nptel.ac.in/courses/106105088	CO2	PPT	https://www.youtube.com/watch?v=c9REsYnavk	PPT(CIA)	
14	L11	2	Arrays within a class, array of objects, memory allocation of objects	Learn different type of IDE	Flipped Classroom			https://nptel.ac.in/courses/106105089	CO1, CO3	PPT	https://www.codewithary.com/videos/cpp-tutorials-in-hindi-23/	Flipped Classroom	
15	L12	2	Passing objects as argument, returning objects from functions	Learn the concept of encapsulation		Lecture through PPT		https://www.youtube.com/watch?v=HwEIZZ0R0k	CO2	PPT	https://www.youtube.com/watch?v=HwEIZZ0R0k	PPT (CIA)	
16	T4	2	Memory Allocation, Passing objects(Tutorial : L10, L11 & L12)	Understand Objects & Functions	Discussion/ Doubt Clearing session			https://www.youtube.com/watch?v=HwEIZZ0R0k	CO2		https://www.youtube.com/watch?v=HwEIZZ0R0k	Group Discussion	
17	L13	2	Function overloading, static data and member functions	Apply the concept of oops		Flipped Classroom	Discussion	https://www.youtube.com/watch?v=LzOZbLwJwM	CO1	PPT	https://www.youtube.com/watch?v=LzOZbLwJwM	Flipped Classroom	
18	L14	2	Friend function and friend class	Understand the concepts of class	Mini Projects	Lecture through PPT	Practical	https://www.youtube.com/watch?v=M9gSidQ9HME	CO2	PPT	https://www.youtube.com/watch?v=M9gSidQ9HME	Mini Projects	
19	L15	2	This pointer	Apply the concept of function		Lecture through PPT	Practical	https://www.youtube.com/watch?v=fnE8cdU8kQA	CO1, CO2	PPT	https://www.youtube.com/watch?v=fnE8cdU8kQA	VIVA	
20	T5	2	Function Overloading, Friend Function & Pointer Tutorial(L13, 14, & 15)	Understand Function overloading	Discussion/ Doubt Clearing session			https://www.youtube.com/watch?v=fnE8cdU8kQA	CO1, CO2		https://www.youtube.com/watch?v=fnE8cdU8kQA	Group Discussion	

Sa
Shikha Yadav

Rajesh Kumar
HOD-BCA
HOD
BCA-TIAS

21	L16	2	Constructors & Destructors: Introduction to constructor and destructor	Understand the concept of constructors		Practical	https://www.youtube.com/watch?v=y9KRmJAMmN4	CO2	PPT	https://www.youtube.com/watch?v=AA8FBg2bA4	PPT(CIA)
22	L17	2	Parameterized constructor, constructor with default arguments, multiple constructors in a class, copy constructor.	Understand the default concept in programming		Practical	https://www.youtube.com/watch?v=skFA3H333sk	CO2	PPT	https://www.youtube.com/watch?v=skFA3H333sk	PPT(CIA)
23	L18	3	Inheritance: Types of inheritance, derivation – public, private & protected	Learn the garbage concept		Practical	https://www.youtube.com/watch?v=skFA3H333sk	CO3	PPT	https://www.youtube.com/watch?v=EYUvPBkGJICQ	PPT(CIA)
24	T6	3	Constructure, Inheritance Tutorial (L16, 17 & 18)	Understand Constructure & Inheritance	Discussion/ Doubt Clearing session		https://www.youtube.com/watch?v=skFA3H333sk	CO3		https://www.youtube.com/watch?v=EYUvPBkGJICQ	Group Discussion
25	L19	2	Ambiguity resolution (function overriding), aggregation, composition v/s classification	Applying dynamic memory allocation		Practical	https://nptel.ac.in/courses/106105084	CO3	PPT	https://www.youtube.com/watch?v=JURE9MCTF8Ls	PPT(CIA)
26	L20	2	Virtual base class, constructor and destructor in derived classes.	Understand the concept of abstract class	Lecture through PPT	Practical	https://nptel.ac.in/courses/106105085	CO2, CO3	PPT	https://www.youtube.com/watch?v=Z_vJEKUS9WTQ	PPT (CIA)
27	L21	2	Polymorphism: Types of polymorphism, early v/s late bindin	Apply the inheritance concept	Lecture through PPT	Practical	https://www.geeksforgeeks.org/inheritance-in-c/	CO3	PPT	https://www.youtube.com/watch?v=U84vE6I_rPk	PPT(CIA)
28	T7	2	Aggregation, Polymorphism (Tutorials L19, L20 & L21)	Understand Aggregation & Polymorphism	Discussion/ Doubt Clearing session		https://www.geeksforgeeks.org/inheritance-in-c/	CO3		https://www.youtube.com/watch?v=U84vE6I_rPk	Group Discussion
29	L22	2	Virtual Functions: Need for virtual functions, pointer to derived class objects	Understand the concept of access specifier	Mini Projects	Practical	https://nptel.ac.in/courses/106105084	CO4	PPT	https://www.youtube.com/watch?v=JUBDbwBvOWE	Mini Projects
30	L23	3	Pure virtual functions, abstract classes.	Understand the concept of hierarchies	Mini Projects	Practical	https://nptel.ac.in/courses/106105085	CO4	PPT	https://www.youtube.com/watch?v=JUBDbwBvOWE	Mini Projects
31	L24	3	Operator Overloading: Overloading unary operators	Learn the concept of polymorphism	Mini Projects	Practical	https://nptel.ac.in/courses/106105086	CO1, CO3	PPT	https://www.youtube.com/watch?v=Wvf52VN3IOA	Mini Projects
32	T8	3	Virtual Functions & Operator Overloading Tutorials (L22, L23 & L24)	Understand Virtual Functions & Operator Overloading	Discussion/ Doubt Clearing session		https://nptel.ac.in/courses/106105086	CO1, CO3		https://www.youtube.com/watch?v=Wvf52VN3IOA	Group Discussion
33	L25	3	Nameless objects, overloading binary operators	Learn the concept of polymorphism	Mini Projects	Practical	https://nptel.ac.in/courses/106105087	CO2	PPT	https://www.youtube.com/watch?v=9ynCoYTxISw	Mini Projects
34	L26	3	Overloading with friend functions	Learn the type of polymorphism	Mini Projects	Practical	https://nptel.ac.in/courses/106105088	CO1	PPT	https://www.youtube.com/watch?v=qRv9WIGdE	Mini Projects
35	L27	3	Conversion between basic types and user-defined types.	Create polymorphism	Mini Projects	Practical	https://nptel.ac.in/courses/106105088	CO2	PPT	https://www.youtube.com/watch?v=V5IKNJP_eCFA	Mini Projects
36	T9	3	Overloading & user defined types (Tutorials L25, L26 & L28)	Understand User Definrd Types	Discussion/ Doubt Clearing session		https://nptel.ac.in/courses/106105088	CO2		https://www.youtube.com/watch?v=V5IKNJP_eCFA	Group Discussion
37	L28	3	Parametric polymorphism: Generic Programming with Templates	Understand the concept of virtual function	Mini Projects	Practical	https://www.youtube.com/watch?v=fB3JHNNRfL	CO3, CO4	PPT	https://www.youtube.com/watch?v=zaqx5hdXBLw	Mini Projects
38	L29	3	Introduction, function templates/generic	Apply different type of binding	Role Play on Relational Model	Lecture through PPT	https://learn.microsoft.com/en-us/dotnet/visual-basic/programming	CO2	PPT	https://www.youtube.com/watch?v=arjFN4Iqfw	VIVA and Presentation
39	L30	3	Functions, characteristics, overloading of template functions	Understand the concept of template		Lecture through PPT	https://www.youtube.com/watch?v=Q7LWewcNplq	CO1, CO4	PPT	https://www.youtube.com/watch?v=yC_lqD_HESII	PPT(CIA)
40	T10	4	Parametric Polymorphism (Tutorials L28, L29 & L30)	Understand Polymorphism	Discussion/ Doubt Clearing session		https://www.youtube.com/watch?v=Q7LWewcNplq	CO1, CO4		https://www.youtube.com/watch?v=yC_lqD_HESII	Group Discussion
41	L31	4	Class templates, template arguments	Understand the concept of template overloading		Lecture through PPT	https://www.youtube.com/watch?v=Q7LWewcNplq	CO4	PPT	https://www.youtube.com/watch?v=Q7LWewcNplq	PPT(CIA)
42	L32	4	Exception Handling: Exception-handling model, types of exception	Understand the concept of template overloading		Lecture through PPT	https://www.youtube.com/watch?v=Q7LWewcNplq	CO4	PPT	https://www.youtube.com/watch?v=Q7LWewcNplq	PPT(CIA)

Shubh
Smitha Yadav

Dr. Rajesh Kumar
(HOD - BCA) HOD
BCA-TIAS

43	L33	4	Catching and handling exceptions, generic catch, rethrowing an exception	Apply overriding concept	Mini Projects	Lecture through PPT		https://www.youtube.com/watch?v=Zd_4xa071nc	CO4	PPT	https://www.youtube.com/watch?v=LskbnpjCFkk	Mini Projects
44	T11	4	Catching and Handling Exception (Tutorial: L31, L32 & L33)	Understand Catching & Handling	Discussion/ Doubt Clearing session			https://www.youtube.com/watch?v=Zd_4xa071nc	CO4		https://www.youtube.com/watch?v=LskbnpjCFkk	Group Discussion
45	L34	4	Specifying exceptions for a function	Understand the concept of file handling		Lecture through PPT	Practical	https://nptel.ac.in/courses/106105084	CO2	PPT	https://www.youtube.com/watch?v=Yz5SL4GIS8	PPT(CIA)
46	L35	4	Streams & Files: C++ Streams, basic stream classes	Understand the concept of stream class		Lecture through PPT	Practical	https://nptel.ac.in/courses/106105085	CO4	PPT	https://www.youtube.com/watch?v=Yz5SL4GIS8	VIVA
47	L36	4	Streams & Files: C++ Streams, basic stream classes	Understand the concept of stream class		Lecture through PPT	Practical	https://nptel.ac.in/courses/106105085	CO4	PPT	https://www.youtube.com/watch?v=Yz5SL4GIS8	PPT(CIA)
48	T12	4	Stream & Files (Tutorials: L34, L35 & L36)	Understand Stream & Files	Discussion/ Doubt Clearing session			https://nptel.ac.in/courses/106105085	CO4		https://www.youtube.com/watch?v=Yz5SL4GIS8	Group Discussion
49	L37	4	C++ predefined streams, I/O operations	Understand the stream classes		Lecture through PPT		https://nptel.ac.in/courses/106105086	CO4	PPT	https://www.youtube.com/watch?v=sc3mse4nin	PPT(CIA)
50	L38	4	Unformatted console I/O operations	Understand the concept of error and how to handle		Lecture through PPT		https://nptel.ac.in/courses/106105087	CO1	PPT	https://www.youtube.com/watch?v=v14PTJl_a4U	Questions from Assnment
51	L39	4	Manipulators, opening and closing a file- different modes and methods	Understand the concept of command line		Lecture through PPT		https://nptel.ac.in/courses/106105086	CO4	PPT	https://www.youtube.com/watch?v=v14PTJl_a4U	PPT(CIA)
52	T13	4	I/O Operations & Manipulators (Tutorials: L37, L38 & L39)	Understand I/O Operations	Discussion/ Doubt Clearing session			https://nptel.ac.in/courses/106105088	CO4		https://www.youtube.com/watch?v=v14PTJl_a4U	Group Discussion
53	L40	4	Error handling during file operations	Understand the how to handle error		Lecture through PPT		https://nptel.ac.in/courses/106105089	CO4	PPT	https://www.youtube.com/watch?v=vnmSRt4OnGn	PPT(CIA)
54	L41	4	File pointers and their manipulations	Understand the how to handle error	Flipped Classroom	Lecture through PPT	Discussion	https://nptel.ac.in/courses/106105090	CO1,CO4	PPT	https://nptel.ac.in/courses/106105090	PPT (CIA)
55	L42	4	Sequential access to file	Learn about exceptional handling	Flipped Classroom	Lecture through PPT		https://nptel.ac.in/courses/106105091	CO4	PPT	https://www.youtube.com/watch?v=Smyj9yD-JFJ	Flipped Classroom
56	T14	4	Error handling, File Pointers (L40, L41 & L42)	Understand Handling & Pointers	Discussion/ Doubt Clearing session			https://nptel.ac.in/courses/106105091	CO4		https://www.youtube.com/watch?v=Smyj9yD-JFJ	Group Discussion
57	L43	4	Random input and output operations	Learn about exceptional handling		Lecture through PPT		https://nptel.ac.in/courses/106105092	CO4	PPT	https://www.youtube.com/watch?v=OuhKhZn4T64	Group Discussion
58	L44	4	Persistent objects,	Doubts clearances session		Lecture through PPT		https://nptel.ac.in/courses/106105092	CO1,CO4		https://www.youtube.com/watch?v=OuhKhZn4T64	PPT(CIA)
59	L45	4	Command line arguments,	Doubts clearances session		Lecture through PPT		https://nptel.ac.in/courses/106105092	CO1,CO4		https://www.youtube.com/watch?v=OuhKhZn4T64	PPT(CIA)
60	T15	4	Persistent objects & Command Line Arguments (Tutorials: L43, L44 & L45)	Revision	Discussion/ Doubt Clearing session			https://nptel.ac.in/courses/106105092	CO1,CO4		https://www.youtube.com/watch?v=OuhKhZn4T64	Group Discussion

Note : 1 Credit (Theory) =15 Hrs. in a Semester; 1 Credit (Practical) =30 Hrs. in a Semester.

TEXTBOOKS:

- TB1. K.R. Venugopal, Rajkumar, T. Ravishanker, "Mastering C++", TMH
- TB2. E. Balagurusamy, "Object Oriented Programming with C++", McGraw-Hill Education

REFERENCE BOOKS:

- RB1 Ashok N. Kamthane, "Object-Oriented Programming with ANSI And Turbo C++", Pearson Education.
- RB2 Schildt Herbert, "C++: The Complete Reference", Tata McGraw Hill.
- RB3 R. L. Johnson, "Object Oriented Programming using C++", Galgotia Publications

JOURNALS

1. Journal of Computer Science and Technology
2. International Journal of Computer Applications
3. Journal of Educational Computing Research
4. ACM Transactions on Programming Languages and Systems (TOPLAS)
5. International Journal of Programming Languages and Compilers
6. Computer Applications in Engineering Education
7. Journal of Computer Science Education
8. The Computer Journal
9. Software: Practice and Experience
10. Journal of Software Engineering and Applications

Name of Faculty : Ms. Shikha Yadav

Head of Department :

Dr. Rajesh Kumar

Date :

HoD
BCA-TIAS

Shikha Yadav