NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF COMPUTER APPLICATIONS

COURSE PLAN – PART I

Name of the programme and specialization	MCA		
Course Title	OBJECT ORIENTED PROGRAMMING		
Course Code	CA716	No. of Credits	3
Course Code of Pre-requisite subject(s)	CA711 PROBLEM SOLVING AND PROGRAMMING		
Session	January 2019	Section (if, applicable)	A
Name of Faculty	Dr. S.Sangeetha	Department	Computer Applications
Official Email	sangeetha@nitt.edu	Telephone No.	0431-2503743
Name of Course Coordinator(s) (if, applicable)	Dr.PJA.Alphonse		
Official E-mail	alphonse@nitt.edu	Telephone No.	0431-2503742
Course Type (please tick appropriately)	☑ Core course	☐ Elective course	

Syllabus (approved in BoS)

Programming Paradigms - Introduction to OOP – Overview of C++ - Classes – Structures – Union – Friend Functions – Friend Classes – Inline functions – Constructors – Destructors – Parameterized Constructors, Multiple Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructors, Destructor - Static Members – Scope Resolution Operator – Passing objects to functions – Function returning objects-Arrays of Objects, Object as Function Arguments.

Arrays – Pointers – this pointer – References – Dynamic memory Allocation – functions Overloading – Default arguments – Overloading Constructors – Pointers to Functions – Ambiguity in function overloading - Operator Overloading – Members Operator Function – Unary and Binary Overloading - Friend Operator Function – Overloading some special operators like [ ] , ( ) , a and comma operator - Binary Operators - Data Conversion - Pitfalls of Operators Overloading And Conversion - Keywords Explicit And Mutable.

Inheritance – Types of Inheritance – Single- Multiple- Multilevel – Hierarchical – Hybrid – Issues in Inheritance - Protected members – Virtual base Class – Polymorphism – Virtual functions – Pure virtual functions – Applications.

Class templates and generic classes – Function templates and generic functions – Overloading function templates – power of templates – Exception Handling – Derived class Exception – over handling generic functions – Exception handling Functions – terminate () unexpected () – Uncaught – exception ().

Streams – Formatted I/O with IOS class functions and manipulators – creating own manipulator – overloading << and >> - File I/O – Name spaces – conversion functions – Array based I/O – Overloading << & >> operators, Error handling during file operations, Formatted I/O - STL-Overview-Container Classes Lists-Maps- Algorithms Using Functions and Objects-String Class - Sequence Containers, Iterators, Specialized Iterators, Associative Containers, Storing User-Defined Object, Function Objects.

COURSE OBJECTIVES

- **To learn the basic principles of object-oriented programming paradigm**
- **To implement object-oriented programming concepts using C++.**
- **To perform object-oriented analysis on a given problem to design and develop a system in C++.**

MAPPING OF COs with POs

Course Outcomes	Programme Outcomes (PO)
1. Identify classes with attributes and functions for given problem	1,2
2. Analyze the relationship between the classes link them using appropriate concepts	1,2,5
3. Design and implement abstract data types.	1,2,3,5
4. Devise generic classes capable of manipulating primitive and user defined data types.	1,3
5. Perform object oriented analysis on a given problem and design a complete system to solve it.	2,3,5,8

COURSE PLAN – PART II

COURSE OVERVIEW

This course introduces the concepts of object-oriented programming to students with a background in the procedural paradigm. It provides in-depth coverage of object-oriented programming principles and techniques using C++. It starts with creation of individual classes, objects with information hiding, constructors and destructors. The course then deals with the concept of function and operator overloading, type conversion among classes. It then explains linking of individual classes using inheritance and composition. The course also deals with creation of templates, writing exception classes, storage and retrieval of objects to/from files.

COURSE TEACHING AND LEARNING ACTIVITIES   (

Week	Contact Hours	Topic	Mode of Delivery
1	1	Introduction to OOP	Chalk and Talk
	2	Comparison with Procedural Programming	Chalk and Talk
	3	Syntax based differences between C and C++	Chalk and Talk
2	1	Constructors	Chalk and Talk Problem Solving
	2	Destructors	-do-
	3	Static members.	-do-
3	1	Friend Functions	-do-
	2	Classes	-do-
	3	Dynamic memory allocation	-do-
4	1	Polymorphism-Function overloading	-do-
	2	Operator overloading	-do-
	3	Unary, binary	-do-
5	1	Type conversion of used defined types	-do-

	2	Constant object and mutable member	-do-
	3	Namespaces	-do-
6	1	Composition, Inheritance and its types.	-do-
	2	Linking classes using composition & Inheritance.	-do-
	3	Access specifiers and accessibility of class members in other classes.	-do-
7	1	Virtual Functions	-do-
	2	Abstract Classes	-do-
	3	Pointers and Objects	-do-
8	1	Exception handling- Basics,	-do-
	2	Built-in exceptions	-do-
	3	User defined exceptions	-do-
9	1	Template-Introduction	-do-
	2	Class template–using Primitive & user defined data types	-do-
	3	Function template –using Primitive &user defined data types	-do-
10	1	Files and Streams	-do-
	2	Character I/O , Object I/O	-do-
	3	Error handling in files	-do-
11	1	STL Introduction	-do-
	2	Containers	-do-
	3	Algorithms	-do-

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Test 1	Week 4	1 Hr	15
2	Test 1	Week 8	1 Hr	15
3	Programming Assignment	Week 7	3 Weeks	30
CPA	Compensation Assessment	At the end of course	1 Hr	15
4	Final Assessment	At the end of course	3 Hrs	40

ESSENTIAL READINGS :

1. Stephen Prata,"C++ Primer Plus", 6th Edition ,Addison-Wesley Professional, 2011
2. Bjarne Stroustrup, "Programming: Principles and Practice Using C++,1st Edition, Addison-Wesley Professional, 2008
3. Andrew Koenig and Barbara E. Moo, "Accelerated C++: Practical Programming by Example", 1st Edition, Addison-Wesley Professional, 2000
4. Bruce Eckel ,"Thinking in C++: Introduction to Standard C++: Volume One" 2nd Edition, Prentice Hall, 2000
5. Andrei Alexandrescu , "Modern C++ Design: Generic Programming and Design Patterns Applied" , 1st Edition, Addison-Wesley Professional, 2001

COURSE EXIT SURVEY

- The students through the class representative may give their feedback at any time to the course faculty which will be duly addressed.
- The students may also give their feedback during Class Committee meeting.
- Feedback from the students will be duly addressed in the subsequent classes.
- COs will be computed for the assessments.

COURSE POLICY (including compensation assessment to be specified)

➢ One compensations assessment will be conducted before the final assessment for those who missed test 1 or test 2.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

➢ At least 75% attendance in each course is mandatory.

➢ A maximum of 10% shall be allowed under On Duty (OD) category.

➢ Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

➢ Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.

➢ Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.

➢ The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

➢ The above policy against academic dishonesty shall be applicable for all the programmes.

➢ The students are expected to come out with their original solution for problems given as assignment, and tests/examinations.

ADDITIONAL INFORMATION, IF ANY

The Course Faculty is available for consultation in office from 4 pm to 5 pm on Monday every week.

FOR APPROVAL

Course Faculty _____ 25/1/19   CC- Chairperson _____ 25/1/19 HOD _____