SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

DEPARTMENT OF INFORMATION TECHNOLOGY	LP: IT22202 Rev. No: 01 Date: 13/02/2024
B.E/B.Tech : INFORMATION TECHNOLOGY Regulation : R2022 PG Specialization : NA Sub. Code / Sub. Name : IT22202 OOPS USING C++ AND PYTHON Unit : I	

Unit Syllabus:

C++ Programming features - Data Abstraction - Encapsulation - Class -Object - Constructors – Static members – Constant members – Member functions – Pointers – References - Role of this pointer – String Handling.

Objective:

To familiarize with the C++ concepts of abstraction, encapsulation, constructor, static and constant members, member functions.

Session No *	Topics to be covered	Ref	Teaching Aids
1	C++ Programming features, Data Abstraction, Encapsulation	1–Ch.1; Pg.9-16 3–Ch.1; Pg.11-19	LCD/BB
2	The Basics of C++, Classes, objects	1-Ch.9,10; Pg.226-271 1-Ch.1; Pg. 47-57 1-Ch.16;Pg.449-480 3–Ch.10; Pg.313-328	LCD/BB
3	Constructors	1-Ch.17; Pg.481-526 3–Ch.11; Pg.364-385	LCD/BB (Experiential – Hands on Demostration and Lab Program)
4	Static members, constant members	1-Ch.16; Pg.467-469 3–Ch.10; Pg.354-357,395-396	LCD/BB (Experiential - Hands on Demostration and Lab Program)
5,6	Member functions, Friend Function and Friend Class	1-Ch.16;Pg. 450-483 1-Ch.19;Pg.571-575 3–Ch.10; Pg.321-323 3–Ch.3; Pg.84-87	LCD/BB (Experiential - Hands on Demostration and Lab Program)
7	Pointers	1-Ch.7; Pg.172-174 3–Ch.5; Pg.268-285	LCD/BB (Participative - Seminar)
8	References, Role of this pointer	1-Ch.7; Pg.189-198 3-Ch.12;Pg.422-431	LCD/BB (Experiential - Hands on Demostration and Lab Program)
9	String Handling	3–Ch.6; Pg.182-186	LCD/BB (Participative - Seminar)

Content beyond syllabus covered (if any):

Basic C++ Programs to understand the fundamentals of OOP, Static objects
Friend Function and Friend Class Programs

* Session duration: 50 minutes

Sub. Code / Sub. Name: **IT22202 OOPS USING C++ AND PYTHON**
Unit : **II**

Unit Syllabus:
Dynamic memory allocation - Nested classes - Polymorphism – Compile time and Run time polymorphisms – Function overloading – Operator overloading - Inheritance – Virtual Functions - Abstract class.

Objective:
To familiarize with the C++ concepts of polymorphism, overloading, Inheritance and virtual functions.

Session No *	Topics to be covered	Ref	Teaching Aids
10	Dynamic memory allocation	1-Ch.11; Pg.277-285	LCD/BB (Experiential - Hands on Demostration and Lab Program)
11	Nested classes	1-Ch.16; Pg.469 3–Ch.11; Pg.397-398	LCD/BB (Experiential - Hands on Demostration and Lab Program)
12	Polymorphism–compile time	1-Ch.20;Pg. 578, 3–Ch.3; Pg.84-86	BB/LCD
13	Run time polymorphisms	1-Ch.13;Pg.347	BB/LCD
14	Function overloading	1-Ch.12; Pg.326-332 3–Ch.7; Pg.214-218	LCD/BB (Experiential - Hands on Demostration and Lab Program)
15	Operator overloading	1-Ch.18; Pg.527-547 3–Ch 13; Pg.430-497	LCD/BB (Experiential - Hands on Demostration and Lab Program)
16	Virtual functions	1-Ch.3;Pg.67-68 3–Ch.15; Pg.572-594	LCD/BB (Experiential - Hands on Demostration and Lab Program)
17	Abstract class	1-Ch.3;Pg.65-67 3–Ch.14; Pg.533	LCD/BB (Experiential - Hands on Demostration and Lab Program)
18	Inheritance	1-Ch.3;Pg.68-72, 1-Ch.15;Pg.390-402 3–Ch.14; Pg.499-524	LCD/BB (Experiential - Hands on Demostration and Lab Program)

Content beyond syllabus covered (if any):
Abstract Method, type casting

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Unit : **III**

Unit Syllabus:

Generic Programming - Function template - Class template - Exception handling - Standard template libraries – containers – iterators – function adaptors – allocators - File handling concepts.

Objective:

To enhance the students' knowledge about the advanced features of C++.

Session No *	Topics to be covered	Ref	Teaching Aids
19	Generic Programming	1-Ch.24; Pg.699-719 3–Ch.16; Pg.596-628	LCD/BB (Experiential - Hands on Demostration and Lab Program)
20	Function template	1-Ch 3; Pg.78-80, 1- Ch 23 – 684 - 694 3–Ch.16; Pg.596-604, 610-614 3-Ch 7; Pg. 219 - 220	LCD/BB (Experiential - Hands on Demostration and Lab Program)
21	Class template	1-Ch.23; Pg.668-672, 675-684	LCD/BB (Experiential - Hands on Demostration and Lab Program)
22	Exception handling	1-Ch.13; Pg. 343-386 3–Ch.19; Pg.703-747	LCD/BB (Experiential - Hands on Demostration and Lab Program)
23	Standard libraries	1-Ch.5; Pg. 111-131	BB/ LCD
24	STL – containers – iterators	1-Ch.31;Pg.885-924, 1-Ch.33;Pg.953-971	LCD/BB (Experiential - Hands on Demostration and Lab Program)
25	Function adaptors	1-Ch.33; Pg. 967-971	LCD/BB (Participative - Seminar)
26	Allocators- Parameterizing the class	1-Ch.34; Pg.995-1002	BB/LCD
27	File handling concepts.	1-Ch.13; Pg.354-359	LCD/BB (Participative - Seminar)
Content beyond syllabus covered (if any): Some Algorithms in STL			

* Session duration: 50 mins

SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

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Unit : **IV**

Unit Syllabus:

Creating python classes, modules and packages, basic inheritance and multiple inheritances, managing objects.

Objective:

Learn to use python classes, packages, and different types of inheritance.

Session No *	Topics to be covered	Ref	Teaching Aids
28	Features of Python	4- Ch 3; Pg. 83-85	LCD/BB
29	Creating python classes-Adding attributes, Making it do something, Initializing object	4- Ch 9;Pg. 400-401 2- Ch 2; pg 27-35	LCD/BB
30	Class Method and self arguments, The _init_()method, del() method	4- Ch 9; pg 402-406	LCD/BB
31	Public and private data members, Calling a class method from another class method.	4- Ch 9; pg 408-410	LCD/BB
32	Modules – The from import statement, Name of the module, The python module, Modules and namespaces,	4- Ch 5; pg 217-225	LCD/BB (Experiential - Hands on Demostration and Lab Program)
33	Packages	4- Ch 5; pg 225-226	LCD/BB (Experiential - Hands on Demostration and Lab Program)
34	Basic inheritance – Extending Built ins, Overriding and super.	4- Ch 10; pg 436-441	LCD/BB (Participative – Projects)
35	Multiple inheritance	2- Ch 3; pg 65-74 4- Ch 7; pg 441-442	LCD/BB (Participative – Projects)
36	Managing objects	2- Ch 5; pg 137-144	LCD/BB (Participative – Projects)

Content beyond syllabus covered (if any):
Data Structures of Python, Basics of Python.

* Session duration: 50 mins

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Sub. Code / Sub. Name: IT22202 OOPS USING C++ AND PYTHON
Unit : V

Unit Syllabus:

Tuples, Dictionaries, List, Sets, Built-in functions, Design patterns-Decorator, Observer, Strategy, State, Singleton, Template.

Objective:

Learn to use tuples, Dictionaries, List, Sets, Built-in functions, Design patterns-Decorator, Observer, Strategy, State, Singleton, and Template using python.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Tuples – Create , access, update, delete elements in tuple, basic tuple operations, Nested tuples	2- Ch 6; pg 159-162 4- Ch 8; pg 346-352	LCD/BB (Experiential - Hands on Demostration and Lab Program)
38	Dictionaries – Create, access, modify, delete, sort items in a dictionary, Nested dictionary	2- Ch 6; pg 160-168 4 - Ch 8; pg 366-374	LCD/BB (Experiential - Hands on Demostration and Lab Program)
39	List – Access, update values in a list, List methods, Nested list, cloning list, Basic list operations, looping in list	4-Ch 8; pg 322-335	LCD/BB (Experiential - Hands on Demostration and Lab Program)
40	Sets – Creating a set	4-Ch 8; pg 359-366	LCD/BB
41	Built-in functions	4-Ch 7; pg 289-299	LCD/BB
42	Design patterns	4-Ch 7; pg 272-276	LCD/BB
43	Decorator, Observer	4- Ch 7; pg 300-302	LCD/BB
44	Strategy, State	4-Ch 12; pg 417-422	LCD/BB
45	Singleton, Template	4-Ch 7; pg 272-276	LCD/BB

Content beyond syllabus covered (if any):
Conversions between list, tuple and dictionary.

* Session duration: 50 mins

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TEXT BOOKS:

1. Bjarne Stroustrup, "The C++ Programming Language", 4th Edition, Addison-Wesley Professional, 2013.
2. Dusty Phillips Python 3 Object-oriented Programming - Second Edition 2015, packt publishers.

REFERENCES:

3. KR Venugopal & Rajkumar Buyya "Mastering C++", second edition 2013.
4. Reema Thareja "PYTHON PROGRAMMING Using Problem Solving Approach", Oxford University Press, 2017.

	Prepared by	Approved by
Signature	13/2/24	13/2/24
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Designation	**Assistant Professor**	**Professor & HoD/INT**
Date	**13/02/2024**	**13/02/2024**
Remarks *:		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD

Note:

The same Lesson-plan will be followed in the A.Y (2024-25) even semester.

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