SEMESTER – VI

Course Code	USA20601J	Course Name	PYTHON PROGRAMMING	Course Category	C	Professional Core	L	T	P	C
							4	0	4	6

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

Course Learning Rationale (CLR):	The purpose of learning this course is to:
CLR-1 :	Describe the core syntax and semantics of Python programming language.
CLR-2 :	Discover the need for working with the strings and functions.
CLR-3 :	Illustrate the process of structuring the data using lists, dictionaries, tuples and sets.
CLR-4 :	Indicate the use of regular expressions and built-in functions to navigate the file system.
CLR-5 :	Infer the Object-oriented Programming concepts in Python.
CLR-6 :	Understand Event Driven Programming

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Learning Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLO-1 :	Develop, document, and debug modular python programs to solve computational problems	3	80	70
CLO-2 :	Select a suitable programming construct and data structure for a situation.	3	85	75
CLO-3 :	Use built-in strings, lists, sets, tuples and dictionary in applications.	3	75	70
CLO-4 :	Define classes and use them in applications	3	85	80
CLO-5 :	Use files for I/O operations.	3	85	75

Program Learning Outcomes (PLO)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	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 :	L	H	-	H	L	-	-	-	L	L	-	H	-	-	-
CLO-2 :	M	H	L	M	L	-	-	-	M	L	-	H	-	-	-
CLO-3 :	M	H	M	H	L	-	-	-	M	L	-	H	-	-	-
CLO-4 :	M	H	M	H	L	-	-	-	M	L	-	H	-	-	-
CLO-5 :	H	H	M	H	L	-	-	-	M	L	-	H	-	-	-

Duration (Hour)		24	24	24	24	24
S-1	SLO-1	An introduction to python programming	The Structure of Strings	Introduction to Lists	Introduction to function	Introduction to classes
	SLO-2	Structure of a Python program	The Subscript Operator	List literals	Functions as Abstraction Mechanisms	Design with Classes
S-2	SLO-1	understanding Python interpreter	Program using subscript operator	Basic list operators	Functions Eliminate Redundancy	Objects and Classes
	SLO-2	understanding Python Shell	Slicing for Substrings	Replacing an Element in a List	Functions Hide Complexity	An example for class
S-3	SLO-1	Datatypes	Program for slicing substrings	Replacing an Element in a List	Functions Support General Methods with Systematic Variations	Docstrings
	SLO-2	Example program using all data types	Testing for a Substring with the in Operator	Example program to Replace an Element in a List	Functions Support the Division of Laboratoryor	Method Definitions
S-4	SLO-1	String literals	Program using substring	List Methods for Inserting Elements	Defining a Recursive Function	The init Method
	SLO-2	Escape Sequences	The Positional System for Representing Numbers	Program to List Methods for Inserting Elements	Tracing a Recursive Function	Instance Variables
S 5-8	SLO-1	Laboratory 1: Write a Python code to display system information using pywhois	Laboratory 4:Make a simple calculator	Laboratory 7: Program to Transpose a Matrix Program to List Methods for Inserting Elements	Laboratory 10: Program using recursive function	Laboratory 13: Program using classes and methods
	SLO-2					
S-9	SLO-1	String Concatenation	Converting binary to decimal	List Methods for Removing Elements	Using Recursive Definitions to Construct Recursive Functions	The str Method
	SLO-2	Variables and the assignment statement	Program to convert binary to decimal	Searching a List	Recursion in Sentence Structure	Accessors
S-10	SLO-1	Example program using variables	Converting decimal to binary	Sorting a List	Infinite Recursion	Mutators
	SLO-2	Program Comments and Doc Strings	Program to convert decimal to binary	Mutator Methods	The Costs and Benefits of Recursion	The Lifetime of Objects
S-11	SLO-1	Numerical Datatypes	String Methods	Aliasing	Managing a Program's Namespace	Rules for Defining a Simple Class
	SLO-2	Character sets	Program using string method	Aliasing side effects	Module Variables, Parameters, and Temporary Variables	Rational Number Arithmetic and Operator Overloading
S-12	SLO-1	Arithmetic expressions	Octal and Hexadecimal Numbers	Equality: Object Identity	Scope	Comparison Methods
	SLO-2	Understanding error messages	Text Files and Their Format	Structural Equivalence	Lifetime	Equality and the eq Method
S 13-16	SLO-1	Laboratory 2: The Magic 8 Ball is a toy used for fortune-telling or seeking advice.	Laboratory 5: Find the Factorial of a Number Python Program to Convert Decimal to Binary, Octal and Hexadecimal	Laboratory 8: Using a List to Find the Median of a Set of Numbers Program using sorting and searching	Laboratory 11: Write the code for a mapping that generates a list of the absolute values of the numbers in a list named numbers.	Laboratory 14: Python Program for Operator overloading
	SLO-2					
S-17	SLO-1	Logical operators	Writing Text to a File	Tuples	Default (Keyword) Arguments	Using pickle for Permanent

						Storage of Objects
	SLO-2	Definite iteration : For loop	Writing Numbers to a File	Creation of several tuples	Functions as First-Class Data Objects	Input of Objects and the try-except Statement
S-18	SLO-1	Example program using for loop	Reading Text from a File	Dictionaries	Mapping	Inheritance Hierarchies and Modeling
	SLO-2	Formatting text for output	Reading Numbers from a File	Dictionary Literals	Filtering	Polymorphic Methods
S-19	SLO-1	Selection : if and if else statement	Example program to read and write text and numbers	Adding Keys and Replacing Values	Reducing	Abstract Classes
	SLO-2	Example program using if and if else	Accessing Files and Directories on Disk	Accessing Values	Using lambda to Create Anonymous Functions	The Costs and Benefits of Object-Oriented Programming
S-20	SLO-1	Conditional iteration :while loop	Manipulating Files and Directories on Disk	Removing Keys	Creating Jump Tables	Event-Driven Programming
	SLO-2	Example program using while loop	Example program to access and manipulate files	Traversing a Dictionary	Example program using functions	Example for Event-Driven Programming
S 21-24	SLO-1	Laboratory 3: Check whether a number is prime or not, Python Program to Generate a Random Number	Laboratory 6: Program to read and write text and numbers	Laboratory 9: When the user enters a statement, the program responds in one of two ways: 1 With a randomly chosen hedge, such as "Please tell me more." 2 By changing some key words in the user's input string and appending this string to a randomly chosen qualifier. Thus, to "My teacher always plays favorites," the program might reply, "Why do you say that your teacher always plays favorites?"	Laboratory 12: Write the code for a filtering that generates a list of the positive numbers in a list named numbers. You should use a lambda to create the auxiliary function.	Laboratory 15: Program using polymorphism, abstract classes
	SLO-2					

Learning Resources	Kenneth A. Lambert, (2011), "The Fundamentals of Python: First Programs", Cengage Learning

Learning Assessment											
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, Short 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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Course Code	**UCS20D07J**	**Course Name**	**MACHINE LEARNING**	**Course Category**	**E**	**Discipline Specific Elective**	**L**	**T**	**P**	**C**
							4	**0**	**4**	**6**

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

Course Learning Rationale (CLR):	The purpose of learning this course is to:	Learning		
		1	2	3
CLR-1 :	To provide basic concepts of machine learning	Level of Thinking (Bloom)	Expected Proficiency (%)	Expected Attainment (%)
CLR-2 :	To provide deeper understanding of various tools and techniques for Machine learning Algorithms and outputs			
CLR-3 :	Understand and Implement the major classification techniques			
CLR-4 :	Understand and Implement the various Clustering Methods			
CLR-5 :	Learn and Understand the Tree based machine Learning Algorithms			

Course Learning Outcomes (CLO):	At the end of this course, learners will be able to:	Learning		
		1	2	3
CLO-1 :	Understand the concepts of machine learning	2	80	85
CLO-2 :	Learn and understand machine tools and libraries of machine learning	2	75	80
CLO-3 :	Learn and understand the linear learning models and classification in machine learning	2	85	80
CLO-4 :	Understand the clustering techniques and their utilization in machine learning	2	80	75
CLO-5 :	Study the tree based machine learning techniques and to appreciate their capability	2	75	85

Program Learning Outcomes (PLO)														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	PSO - 1	PSO - 2	PSO – 3
H	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H	H	H	-	H	-	-	-	-	-	-	-	-	-	-
H	H	-	-	H	-	-	-	-	-	-	-	-	-	-
H	H	-	-	H	-	-	-	-	-	-	-	-	-	-
H	H	-	H	H	-	-	-	-	-	-	-	-	-	-