SRI KRISHNA INSTITUTE OF TECHNOLOGY

(Accredited by NAAC, Approved by A.I.C.T.E. New Delhi, Recognised by Govt. of Karnataka & Affiliated to V.T U., Belgaum)
#29, Chimney Hills, Hesaraghatta Main Road, Chikkabanavara Post, Bangalore- 560090

Department of Information Science and Engineering

Academic Year: 2022-23	Semester: 5
Course Name: Application Development using Python	Course Code: 18CS55
Total Contact hours: 40	Credits: 3
SEE Marks: 60 CIE: 40	Total Marks: 100
Course Plan Author: Mrs. Veena M Naik	Date: 29/09/2022

Course Prerequisites: Basic Knowledge about C++, Programming Platform and structure of programming.

Course Objectives:

- Learn the syntax and semantics of Python programming language.
- Illustrate the process of structuring the data using lists, tuples and dictionaries.
- Demonstrate the use of built-in functions to navigate the file system.
- Implement the Object Oriented Programming concepts in Python.
- Appraise the need for working with various documents like Excel, PDF, Word and Others.

Course Outcomes:

CO Number	Course Outcome At the end of the course, student should be able to..	Blooms' Level
CO1	Demonstrate proficiency in handling of loops and creation of functions.	L2
CO2	Identify the methods to create and manipulate lists, tuples and dictionaries.	L2
CO3	Discover the commonly used operations involving regular expressions and file system.	L2
CO4	Interpret the concepts of Object-Oriented Programming as used in Python.	L3
CO5	Determine the need for scraping websites and working with CSV, JSON and other file formats.	L3

Program Outcomes and Program Specific Outcomes

PO, PSO	*1.Engineering Knowledge;* *2.Problem Analysis;* *3.Design / Development of Solutions;* *4.Conduct Investigations of Complex Problems;* *5.Modern Tool Usage;* *6.The Engineer and Society;* *7.Environment and Sustainability;* *8.Ethics;* *9.Individual and Teamwork;* *10.Communication;* *11.Project Management and Finance;* *12.Life-long Learning;* *PSO1.:To understand and process the principles of mathematics in the field of Information Science by applying different design principles.* *PSO2.:To impart the knowledge by experimental methods in multidisciplinary domains.* *PSO3 : To inculcate communication skills and teamwork in developing sustainable software's by imparting professional and ethical values.*

CO – PO Mapping

Course Outcomes	Program Outcomes														
	PO1	PO2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2		2		2				2		2		1	1	2
CO2	2	2	2		2				2		1		1	1	2
CO3	2	2	2		2				2		1		2	1	2
CO4	2	2	2						2		2		2	1	2
CO5	2		2		2				2		2		2	1	2

Course Content (Syllabus)

Module – 1	**Teaching Hours**
Python Basics, Entering Expressions into the Interactive Shell, The Integer, Floating-Point, and String Data Types, String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program,Flow control, Boolean Values, Comparison Operators, Boolean Operators,Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules,Ending a Program Early with sys.exit(), Functions, def Statements with Parameters, Return Values and return Statements,The None Value, Keyword Arguments and print(), Local and Global Scope, The global Statement, Exception Handling, A Short Program: Guess the Number	**08**
Module – 2	
Lists, The List Data Type, Working with Lists, Augmented Assignment Operators, Methods, Example Program: Magic 8 Ball with a List, List-like Types: Strings and Tuples,References, Dictionaries and Structuring Data, The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real-World Things, Manipulating	**08**

Strings, Working with Strings, Useful String Methods, Project: Password Locker, Project: Adding Bullets to Wiki Markup	
Module – 3	
Pattern Matching with Regular Expressions, Finding Patterns of Text Without Regular Expressions, Finding Patterns of Text with Regular Expressions,More Pattern Matching with Regular Expressions, Greedy and Nongreedy Matching, The findall() Method, Character Classes, Making Your Own Character Classes, The Caret and Dollar Sign Characters, The Wildcard Character, Review of Regex Symbols, Case-Insensitive Matching, Substituting Strings with the sub() Method, Managing Complex Regexes, Combining re .IGNORECASE, re .DOTALL, and re .VERBOSE, Project: Phone Number and Email Address Extractor, Reading and Writing Files, Files and File Paths, The os.path Module, The File Reading/Writing Process, Saving Variables with the shelve Module,Saving Variables with the pprint.pformat() Function, Project: Generating Random Quiz Files, Project: Multiclipboard, Organizing Files, The shutil Module, Walking a Directory Tree, Compressing Files with the zipfile Module, Project: Renaming Files with American-Style Dates to European-Style Dates,Project: Backing Up a Folder into a ZIP File, Debugging, Raising Exceptions, Getting the Traceback as a String, Assertions, Logging, IDLE‟s Debugger.	**08**
Module – 4	
Classes and objects, Programmer-defined types, Attributes, Rectangles, Instances as return values, Objects are mutable, Copying, Classes and functions, Time, Pure functions, Modifiers, Prototyping versus planning, Classes and methods, Object-oriented features, Printing objects, Another example, A more complicated example,The init method, The __str__ method, Operator overloading, Type-based dispatch, Polymorphism, Interface and implementation,Inheritance, Card objects, Class attributes, Comparing cards, Decks, Printing the deck, Add, remove, shuffle and sort, Inheritance, Class diagrams, Data encapsulation	**08**
Module – 5	
Web Scraping, Project: MAPIT.PY with the web browser Module, Downloading Files from the Web with the requests Module, Saving Downloaded Files to the Hard Drive, HTML, Parsing HTML with the BeautifulSoup Module, Project: “I‟m Feeling Lucky” Google Search,Project: Downloading All XKCD Comics, Controlling the Browser with the selenium Module, Working with Excel Spreadsheets, Excel Documents, Installing the openpyxl Module, Reading Excel Documents, Project: Reading Data from a Spreadsheet, Writing Excel Documents, Project: Updating a Spreadsheet, Setting the Font Style of Cells, Font Objects, Formulas, Adjusting Rows and Columns, Charts, Working with PDF and Word Documents, PDF Documents, Project: Combining Select Pages from Many PDFs, Word Documents, Working with CSV files and JSON data, The csv Module, Project: Removing the Header from CSV Files, JSON and APIs, The json Module, Project: Fetching Current Weather Data	**08**

Schedule of Instruction

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Department of Information Science and Engineering

Sl.no	Class no	Module	Topic	Reference (Book, Page no.)	Course Outcome	Delivery mode
1		**Module1:**	Python Basics, Entering Expressions into the Interactive Shell,	T1, 03	CO1	PPT
2			The Integer, Floating-Point, and String Data Types, String Concatenation and Replication,	T1, 07	CO1	PPT
3			Storing Values in Variables, Your First Program, Dissecting Your Program	T1, 10 T1,13	CO1	PPT
4			Flow control, Boolean Values, Comparison Operators, Boolean Operators,Mixing Boolean and Comparison Operators,	T1, 21 T1, 25	CO1	PPT
5			Elements of Flow Control, Program Execution,Importing Modules, Ending a Program Early with sys.exit(),	T1, 27 T1, 49	CO1	PPT
6			Functions, def Statements with Parameters, Return Values and return Statements,The None Value, Keyword Arguments and print(),	T1, 57 T1, 62	CO1	PPT
7			Local and Global Scope, The global Statement, Exception Handling, A Short Program: Guess the Number	T1, 65	CO1	PPT
8			Example programs on python		CO1	PPT
9		**Module 2:**	Lists, The List Data Type, Working with Lists,	T1, 77	CO2	PPT
10			Augmented Assignment Operators, Methods, Example Program: Magic 8 Ball with a List,	T1, 87	CO2	PPT
11			List-like Types: Strings and Tuples, References,	T1, 94	CO2	PPT
12			Dictionaries and Structuring Data, The Dictionary Data Type, Pretty Printing,	T1, 111	CO2	PPT
13			Using Data Structures to Model Real-World Things	T1, 119	CO2	PPT

14			Manipulating Strings, Working with Strings,	T1, 130	CO2	PPT
15			Useful String Methods, Project: Password Locker,	T1, 138	CO2	PPT
16			Project: Adding Bullets to Wiki Markup	T1, 147	CO2	PPT
18		**Module 3:**	Finding Patterns of Text Without Regular Expressions, Finding Patterns of Text with Regular Expressions,	T1, 162 T1, 165	CO3	PPT
19			More Pattern Matching with Regular Expressions, Greedy and Nongreedy Matching, The findall() Method, Character Classes,	T1, 166 T1, 171	CO3	PPT
20			Making Your Own Character Classes, The Caret and Dollar Sign Characters, The Wildcard Character, Review of Regex Symbols, Case-Insensitive Matching, Substituting Strings with the sub() Method, Managing Complex Regexes,	T1, 173 T1, 177	CO3	PPT
21			Combining re .IGNORECASE, re .DOTALL, and re .VERBOSE, Project: Phone Number and Email Address Extractor, Reading and Writing Files,	T1, 179 T1, 202	CO3	PPT
22			Files and File Paths, The os.path Module, The File Reading/Writing Process, Saving Variables with the shelve Module,Saving Variables with the pprint.pformat() Function, Project: Generating Random Quiz Files,	T1, 206 T1, 215 T1, 220	CO3	PPT
23			Multiclipboard, Organizing Files, The shutil Module, Walking a Directory Tree, Compressing Files with the zipfile Module, Project: Renaming Files with American-Style Dates to European-Style Dates	T1, 226 T1, 232	CO3	PPT
24			Backing Up a Folder into a ZIP File, Debugging, Raising Exceptions, Getting the Traceback as a String, Assertions, Logging, IDLE‟s Debugger.	T1, 239	CO3	PPT
25		**Module 4:**	Classes and objects, Programmer-defined types, Attributes, Rectangles,	T2, 143	CO4	PPT

26			Instances as return values, Objects are mutable, Copying,	T2, 150	CO4	PPT
27			Classes and functions, Time, Pure functions, Modifiers,	T2, 155	CO4	PPT
28			Prototyping versus planning, Classes and methods, Object-oriented features, Printing objects,	T2, 158	CO4	PPT
29			The init method, The __str__ method, Operator overloading,	T2, 164	CO4	PPT
30			Type-based dispatch, Polymorphism, Interface and implementation	T2, 168	CO4	PPT
31			Inheritance, Card objects, Class attributes, Comparing cards, Decks,	T2, 171	CO4	PPT
32			Printing the deck, Add, remove, shuffle and sort, Inheritance, Class diagrams, Data encapsulation	T2, 174	CO4	PPT
33		**Module 5:**	MAPIT.PY with the web browser Module, Downloading Files from the Web with the requests Module, Saving Downloaded Files to the Hard Drive,	T1, 268	CO5	PPT
34			HTML, Parsing HTML with the BeautifulSoup Module, Project: “I‟m Feeling Lucky” Google Search	T1,274	CO5	PPT
35			Downloading All XKCD Comics, Controlling the Browser with the selenium Module, Working with Excel Spreadsheets,	T1, 286	CO5	PPT
36			Excel Documents, Installing the openpyxl Module, Reading Excel Documents, Project: Reading Data from a Spreadsheet, Writing Excel Documents,	T1, 302	CO5	PPT
37			Updating a Spreadsheet, Setting the Font Style of Cells, Font Objects, Formulas, Adjusting Rows and Columns,	T1, 313	CO5	PPT
38			Charts, Working with PDF and Word Documents, PDF Documents	T1, 326	CO5	PPT
39			Combining Select Pages from Many PDFs, Word Documents, Working with CSV files and JSON data,	T1, 355	CO5	PPT

40			The csv Module, Project: Removing the Header from CSV Files, JSON and APIs, The json Module, Project: Fetching Current Weather Data	T1, 378	CO5	PPT

**L – Lecture, V- Videos or any other mode*

Textbooks	
T1	Al Sweigart, "Automate the Boring Stuff with Python",1 stEdition, No Starch Press, 2015.
T2	Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2 nd Edition, Green Tea Press, 2015.
Reference books	
R1	Gowrishankar S, Veena A, "Introduction to Python Programming", 1 st Edition, CRC Press/Taylor & Francis, 2018.
R2	Jake VanderPlas, "Python Data Science Handbook: Essential Tools for Working with Data", 1 st Edition, O"Reilly Media, 2016.
R3	Charles Dierbach, "Introduction to Computer Science Using Python", 1 st Edition, Wiley India Pvt Ltd, 2015.
R4	Wesley J Chun, "Core Python Applications Programming", 3 rd Edition, Pearson Education India, 2015.

Web links and Video Lectures (e-Resources):	
1	

Assessment Schedule:

Sl.No.	Assessment type	Contents	CO	Duration In Hours	Marks	Date & Time
1	**CIE Test 1**	M1 and M2	CO1,CO2	1:15 Hrs	30	
2	**CIE Test 2**	M3 and M4	CO3, CO4	1:15 Hrs	30	
	CIE Test 3	M5	CO5	1:15 Hrs	30	
3	**Assignment 1**	M1 and M2(Unit Test)	CO1,CO2		10	
4	**Assignment 2**	M3 and M4(Unit Test)	CO3,CO4		10	
5	**Mini Project** ***(or any planned activtiy)***	M5, Quiz, Code Writing activity, Jeopardy Game, Infosys Springboard Certification	CO5	1Hr	10	

6	**Semester End Examination**	M1,M2,M3,M4 and M5	CO1,CO2, CO3,CO4, CO5	3:00 Hrs	60	

Mini Project: Group of 2-3 students
Module 1,2,3,4 & 5
****The sum of total marks of three tests, two assignments, and seminar will be out of 100 marks and will be scaled down to 50 marks.**

CIE + SEE = 40 + 60 = 100 marks

Faculty Incharge DAC Chairman