

## CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Essentials of Python	2	0	0	2	Class XII	NA

### Learning Objectives

The Learning Objectives of this course are as follows:

- To introduce programming concepts using python
- To use python programming to solve problems of different domains

### Learning outcomes

The Learning Outcomes of this course are as follows:

- After studying this course, students will be able to understand the basics of programming language
- After studying this course, students will be able to develop, document and debug modular python programs
- After studying this course, students will be able to apply suitable programming constructs and built in data structures to solve a problem

## SYLLABUS

### Unit I (12 hours)

#### Introduction

What can Python do? Why Python? Python Syntax compared to other programming languages, Python Installation.

The print statement, Comments, Python Data Structures & Data Types, String Operations in Python, Simple Input & Output, Simple Output Formatting, Operators in python

#### Python Program Flow

Indentation, The If statement and its' related statement, An example with if and it's related statement, The while loop, The for loop, The range statement, Break &Continue, Assert, Examples for looping

## **Functions& Modules**

Create your own functions, Functions Parameters, Variable Arguments, Scope of a Function, Function Documentations, Lambda Functions& map, n Exercise with functions, Create a Module, Standard Modules

## **Unit 2**

**(16 hours)**

### **Exceptions Handling**

Errors, Exception handling with try, handling Multiple Exceptions, Writing your own Exception

### **File Handling**

File handling Modes, Reading Files, Writing& Appending to Files, Handling File Exceptions, The with statement

### **Classes In Python**

New Style Classes, Creating Classes, Instance Methods, Inheritance, Polymorphism, Exception Classes & Custom Exceptions

### **Generators and iterators**

Iterators, Generators, The Functions any and all, With Statement, Data Compression

## **Unit 3**

**(16 hours)**

### **Data Structures**

List Comprehensions, Nested List Comprehensions, Dictionary Comprehensions. Functions, Default Parameters, Variable Arguments, Specialized Sorts

### **Collections**

namedtuple(), deque, ChainMap, Counter, OrderedDict, defaultdict, UserDict, UserList, UserString

### **Writing GUIs in Python (Tkinter)**

Introduction, Components and Events, An Example GUI, The root Component, Adding a Button, Entry Widgets, Text Widgets, Check buttons

### **Python SQL Database Access**

Introduction, Installation, DB Connection, Creating DB Table, INSERT, READ, UPDATE, DELETE operations, COMMIT & ROLLBACK operation, handling Errors

### **Network Programming**

Introduction, A Daytime Server, Clients and Servers, The Client Program, The Server Program

### **Date and Time**

Sleep, Program execution time, more methods on date/time

## Unit 4

(16 hours)

Filter, Map, Reduce, Decorators, Frozen set, Collections

### Regular Expression

Split, Working with special characters, date, emails, Quantifiers, Match and find all, character sequence and substitute, Search method

### Threads ESSENTIAL

Class and threads, Multi-threading, Synchronization, Treads Life cycle, use cases

### Accessing API ESSENTIAL

Introduction, Facebook Messenger, Openweather

### DJANGO

Django Overview, Django Installation, Creating a Project, Usage of Project in depth Discussion, Creating an Application, Understanding Folder Structure, Creating a Hello World Page, Database and Views, Static Files and Forms, API and Security

### Essential/recommended readings

- "Starting Out with Python plus My Programming Lab with Pearson eText -- Access Card Package (3rd Edition) Tony Gaddis ISBN-13: 978-0133862256".
- Python Crash Course: A Hands-On, Project-Based Introduction to Programming (2nd Edition).
- Head-First Python: A Brain-Friendly Guide (2nd Edition) by Paul Barry.
- Learn Python the Hard Way: 3rd Edition by Zed A. Shaw.
- Python Programming: An Introduction to Computer Science (3rd Edition) by John M. Zelle.
- Python Cookbook: Recipes for Mastering Python 3 (3rd Edition) by Brian Jones and David Beazley
- <https://docs.djangoproject.com/>
- Introduction to Programming using Python by Y. Daniel Liang. Publisher Pearson
- Taneja, S., Kumar, N. Python Programming- A modular Approach, Pearson Education India, 2018.
- Balaguruswamy E., Introduction to Computing and Problem Solving using Python, 2 nd edition, McGraw Hill Education, 2018

### Examination scheme and mode:

Evaluation scheme and mode will be as per the guidelines notified by the University of Delhi.