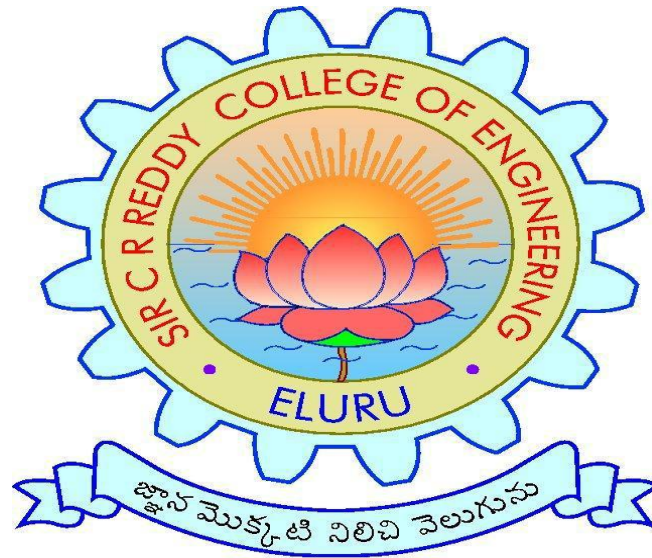


SIR C R REDDY COLLEGE OF ENGINEERING, ELURU  
DEPARTMENT OF INFORMATION TECHNOLOGY

**LESSON PLAN**



**SUBJECT: PYTHON PROGRAMMING (R1621054)**  
**CLASS: II/IV B.Tech., 1<sup>st</sup> SEMESTER, A.Y.2019-20**  
**INSTRUCTOR: G. PAVAN**

## COURSE CONTENTS

Category of Course	Course Title	Course Code	Credits- 4 C	Theory Paper
B.TECH	PYTHON PROGRAMMING	R1621054	L-4 T-1	Max.Marks-70 Duration-3hrs.

### **Course description:**

The course is designed to provide Basic knowledge of Python. Python is a language with a simple syntax, and a powerful set of libraries. It is an interpreted language, with a rich programming environment, including a robust debugger and profiler. While it is easy for beginners to learn, it is widely used in many scientific areas for data exploration. This course is an introduction to the Python programming language for students without prior programming experience. A brief introduction to Python classes and object oriented design is included. Upon completion, students should be able to design, code, test, and debug Python language programs.

### **Scope and objectives:**

On completing this course student will be able to

- Understanding of scripting and the contributions of scripting languages.
- Implement a given algorithm as a computer program.
- Understanding of the built-in objects of Python.
- Understanding of Python especially the object-oriented concepts.
- Identify and repair coding errors in a program using testing.

### **Prerequisite:**

Experience with a high level language (C/C++, Java, MATLAB) is suggested. Prior knowledge of a scripting language (Perl, UNIX/Linux shells) and Object-Oriented concepts is helpful but not mandatory.

### **Required Textbook:**

1. Python Programming: A Modern Approach, Vamsi Kurama, Pearson
2. Learning Python, Mark Lutz, Orielly

### **Reference Books**

1. Think Python, Allen Downey, Green Tea Press
2. Core Python Programming, W.Chun, Pearson.
3. Introduction to Python, Kenneth A. Lambert, Cengage

## **Syllabus**

**II Year - I Semester**

**L T P C**  
**4 0 0 3**

### **PYTHON PROGRAMMING**

#### **UNIT - I**

Introduction:History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation.

#### **UNIT - II**

Types, Operators and Expressions: Types - Integers, Strings, Booleans; Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations Control Flow- if, if-elif-else, for, while, break, continue, pass.

#### **UNIT - III**

Data Structures Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences, Comprehensions.

#### **UNIT - IV**

Functions - Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions,

Fruitful Functions(Function Returning Values), Scope of the Variables in a Function - Global and Local Variables.

Modules: Creating modules, import statement, from. Import statement, name spacing, Python packages, Introduction to PIP, Installing Packages via PIP, Using Python Packages

#### **UNIT - V:**

Object Oriented Programming OOP in Python: Classes, 'self variable', Methods, Constructor Method, Inheritance, Overriding Methods, Datahiding,

Error and Exceptions: Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions

#### **UNIT - VI**

Brief Tour of the Standard Library - Operating System Interface - String Pattern Matching, Mathematics, Internet Access, Dates and Times, Data Compression, Multithreading, GUI Programming, Turtle Graphics

Testing: Why testing is required ?, Basic concepts of testing, Unit testing in Python, Writing Test cases, Running Tests.

**SIR C R REDDY COLLEGE OF ENGINEERING :: ELURU****DEPARTMENT OF INFORMATION TECHNOLOGY****COURSE SCHEDULE**

<b>Unit No</b>	<b>Description of the Chapter</b>	<b>Description of the Topics</b>	<b>Total No.of periods (L+T)</b>
1	Introduction	History of Python, Need of Python Programming, Applications Basics of Python Programming Using the REPL(Shell), Running Python Scripts, Variables, Assignment, Keywords, Input-Output, Indentation.	8+2
2	Types, Operators and Expressions	Types - Integers, Strings, Booleans; Operators- Arithmetic Operators, Comparison (Relational) Operators, Assignment Operators, Logical Operators, Bitwise Operators, Membership Operators, Identity Operators, Expressions and order of evaluations Control Flow- if, if-elif-else, for, while, break, continue, pass	8+2
3	Data Structures	Lists - Operations, Slicing, Methods; Tuples, Sets, Dictionaries, Sequences, Comprehensions.	8+2
4	Functions, Modules, Python Packages	<u>Functions:</u> Defining Functions, Calling Functions, Passing Arguments, Keyword Arguments, Default Arguments, Variable-length arguments, Anonymous Functions, Fruitful Functions(Function Returning Values), Scope of the Variables in a Function - Global and Local Variables. <u>Modules:</u> Creating modules, import statement, from. Import statement, name spacing, <u>Python Packages:</u> Introduction to PIP, Installing Packages via PIP, Using Python Packages	10+2

5	Object Oriented Programming OOP in Python, Error and Exceptions	<u>Object Oriented Programming OOP in Python</u> : Classes, 'self variable', Methods, Constructor Method, Inheritance, Overriding Methods, Datahiding, <u>Error and Exceptions</u> : Difference between an error and Exception, Handling Exception, try except block, Raising Exceptions, User Defined Exceptions	10+2
6	Brief Tour of the Standard Library, Testing	<u>Brief Tour of the Standard Library</u> : Operating System Interface - String Pattern Matching, Mathematics, Internet Access, Dates and Times, Data Compression, Multithreading, GUI Programming, Turtle Graphics <u>Testing</u> : Why testing is required ?, Basic concepts of testing, Unit testing in Python, Writing Test cases, Running Tests.	10+2

Total no of instructional periods available for the course : 75 periods

Total no of estimated periods : 66 periods

**Signature of the H.O.D**

**Signature of the Faculty**

**Date:**

**SIR C R REDDY COLLEGE OF ENGINEERING :: ELURU****DEPARTMENT OF INFORMATION TECHNOLOGY****COURSE PLAN**

<b>S.No.</b>	<b>Topics to be covered</b>	<b>Teaching aids used LCD/BB</b>	<b>Reference</b>
<b>UNIT – I INTRODUCTION</b>			
1.1	History of Python	BB	TB/INTERNET
1.2	Need of Python Programming	BB	TB/INTERNET
1.3	Applications Basics of Python	BB	TB/INTERNET
1.4	Programming Using the REPL (Shell)	BB/LCD	TB/INTERNET
1.5	Running Python Scripts	BB/LCD	TB/INTERNET
1.6	Variables	BB	TB/INTERNET
1.7	Assignment	BB	TB/INTERNET
1.8	Keywords	BB	TB/INTERNET
1.9	Input-Output	BB	TB/INTERNET
1.10	Indentation	BB	TB/INTERNET
<b>UNIT-II TYPES, OPERATORS &amp; EXPRESSIONS</b>			
2.1	Types – Integers, Strings, Boolean	BB/LCD	TB/INTERNET
2.2	Arithmetic Operators	BB	TB/INTERNET
2.3	Comparison (Relational) Operators	BB	TB/INTERNET
2.4	Assignment Operators	BB	TB/INTERNET
2.5	Logical Operators	BB	TB/INTERNET
2.6	Bitwise Operators	BB	TB/INTERNET
2.7	Membership Operators	BB	TB/INTERNET
2.8	Identity Operators	BB	TB/INTERNET
2.9	Expressions & Order of Evaluations	BB/LCD	TB/INTERNET
2.10	Control Flow – if, if-elif-else, for, while, break, continue, pas	BB	TB/INTERNET
<b>UNIT-III DATA STRUCTURES</b>			
3.1	Lists – Operations, Slicing, Methods	BB/LCD	TB/INTERNET
3.2	Tuples	BB/LCD	TB/INTERNET
3.3	Sets	BB/LCD	TB/INTERNET
3.4	Dictionaries	BB/LCD	TB/INTERNET
3.5	Sequences	BB/LCD	TB/INTERNET
3.6	Comprehensions	BB/LCD	TB/INTERNET
<b>UNIT-IV FUNCTIONS, MODULES, PYTHON PACKAGES</b>			
4.1	Defining Functions	BB	TB/INTERNET
4.2	Calling Functions	BB	TB/INTERNET
4.3	Passing Arguments	BB	TB/INTERNET
4.4	Keyword Arguments	BB	TB/INTERNET
4.5	Default Arguments	BB	TB/INTERNET

4.6	Variable-Length Arguments	BB	TB/INTERNET
4.7	Anonymous Functions	BB	TB/INTERNET
4.8	Fruitful Functions (Function Returning Values)	BB	TB/INTERNET
4.9	Scope of Variables in a Function – Global & Local Variables	BB	TB/INTERNET
4.10	Creating Modules	BB/LCD	TB/INTERNET
4.11	import statement	BB/LCD	TB/INTERNET
4.12	from. Import statement	BB/LCD	TB/INTERNET
4.13	Name Spacing	BB	TB/INTERNET
4.14	Introduction to PIP	BB/LCD	TB/INTERNET
4.15	Installing Packages via PIP	BB/LCD	TB/INTERNET
4.16	Using Python Packages	BB/LCD	TB/INTERNET
<b>UNIT-V</b>			
<b>OBJECT ORIENTED PROGRAMMING OOP IN PYTHON, ERRORS &amp; EXCEPTIONS</b>			
5.1	Classes	BB	TB/INTERNET
5.2	Self Variable	BB	TB/INTERNET
5.3	Methods	BB	TB/INTERNET
5.4	Constructor Method	BB	TB/INTERNET
5.5	Inheritance	BB	TB/INTERNET
5.6	Overriding Methods	BB	TB/INTERNET
5.7	Data hiding	BB	TB/INTERNET
5.8	Difference between an Error & Exception	BB	TB/INTERNET
5.9	Handling Exception	BB/LCD	TB/INTERNET
5.10	try except block	BB/LCD	TB/INTERNET
5.11	Raising Exceptions	BB/LCD	TB/INTERNET
5.12	User Defined Exceptions	BB	TB/INTERNET
<b>UNIT-VI</b>			
<b>BRIEF TOUR OF STANDARD LIBRARY, TESTING</b>			
6.1	Operating System Interface	BB	TB/INTERNET
6.2	String Pattern Matching	BB	TB/INTERNET
6.3	Mathematics	BB	TB/INTERNET
6.4	Internet Access	BB	TB/INTERNET
6.5	Dates & Times	BB/LCD	TB/INTERNET
6.6	Data Compression	BB	TB/INTERNET
6.7	Multithreading	BB/LCD	TB/INTERNET
6.8	GUI Programming	BB/LCD	TB/INTERNET
6.9	Turtle Graphics	BB/LCD	TB/INTERNET
6.10	Why Testing is required	BB/LCD	TB/INTERNET
6.11	Basic concepts of Testing	BB/LCD	TB/INTERNET
6.12	Unit Testing in Python	BB/LCD	TB/INTERNET
6.13	Writing Test Cases	BB/LCD	TB/INTERNET
6.14	Running Tests	BB/LCD	TB/INTERNET

**Evaluation Scheme:**



Test	Marks
Internal Test-1	15
Internal Test-2	15
Internal Marks	Average of 80% of best internal and 20% of other internal test (15)
Assignment-1	5
Assignment-2	5
Assignment Marks	2 Assignments (10)
External exam	70
Total	100

**Notices:**

Answers for Questions in Internal and External Examinations will be available in the Department Library of Information Technology. Any circulars related to course will be displayed in notice boards of Department of Information Technology.

**Method of Evaluation:**

Continuous Assessment Examination: Yes / No

Assignments: Yes / No

Questions in class room: Yes / No

Quiz as per University Norms: Yes / No

**Others:** Make the students to solve the problems on the board  
(Please Specify)

Students are being taken to lab and provide hands-on experience to them.

## UNITWISE QUESTIONS

### UNIT - I

#### Short Answer Questions:

1. What is indentation?
2. Explain about input function.
3. Explain about output function.
4. What are the features of python?
5. What are the applications of python?
6. What are the advantages & disadvantages of python?

#### Essay Questions:

1. Write the history of python.
2. Explain about IDLE startup details.
3. Briefly discuss about running python scripts.
4. Explain about keywords in python.
5. Discuss about variables & assignments.

### UNIT – II

#### Short Answer Questions:

1. Give an example of istitle() method.
2. Give an example of lstrip() method.
3. Give an example of isalnum() method.
4. Give an example of endswith() method.

#### Essay Questions:

1. What are 4 built-in-numeric data types in python? Explain.
2. What is an operator? Explain all the operators available in python with an example.
3. Describe python jump statements with examples.
4. Explain about iteration statements with example.
5. Discuss about python operators precedence with example.
6. Briefly discuss about string methods in python.

7. List different conditional statements in python with appropriate example.

### UNIT – III

#### **Short Answer Questions:**

1. How to access values in a dictionary?
2. What is a set? Why sets are required?
3. Define list.
4. What is a dictionary?
5. What is a tuple?
6. Describe type() method with example.

#### **Essay Questions:**

1. Explain in detail about Dictionaries in Python.
2. Explain in detail about Lists in Python.
3. Explain in detail about Tuples in Python.
4. Explain in detail about Sets in Python.
5. Explain in detail about Sequences & Comprehensions in Python.

### UNIT – IV

#### **Short Answer Questions:**

1. Define function.
2. Define Module.
3. Define Package.
4. What is the general form of lambda?
5. What is namespace?

#### **Essay Questions:**

1. Explain the following
  - Default Arguments
  - Passing Arguments
  - Keyword Arguments
  - Variable Length Arguments

- Anonymous Function
  - Fruitful Functions
  - Local & Global Variable
  - Calling Function
2. Why do we use Modules? How can we structure a program?
  3. Briefly discuss about Python packages.
  4. Discuss in detail about import statement.
  5. Write a brief note on PIP. Explain installing packages via PIP.

## UNIT – V

### **Short Answer Questions:**

1. What is a class?
2. State the syntax to define a class.
3. What are basic overloading methods?
4. Explain about self-variable with an example.
5. What is constructor?
6. What is destructor?
7. Explain User defined exception with an example.
8. Give an example for raising an exception.

### **Essay Questions:**

1. Explain creating classes in python with examples.
2. Define Error & Exception. Distinguish between these two features.
3. Explain about the process of handling an exception.
4. What is inheritance? Explain inheritance with suitable example.
5. Discuss about try-except-finally block with example.
6. Explain about except clause with multiple exceptions.

## UNIT – VI

### **Short Answer Questions:**

1. Explain importing turtle graphics.
2. Describe time.time() method.

3. What is tick?
4. Explain White Box & Black Box testing.
5. Explain different types of automated testing.

**Essay Questions:**

1. Why is testing required? Explain laborately.
2. Explain writing test cases & running tests.
3. Explain about Unit Testing in Python.
4. Explain the concept of Multi threading.
5. Explain about turtle methods.
6. Explain about
  - zlib module
  - Paned Window
  - math module

**Expected Date of completion of the Course:**

Unit Number: 1	30 <sup>th</sup> JUN 2019
Unit Number: 2	20 <sup>th</sup> JUL 2019
Unit Number: 3	10 <sup>th</sup> AUG 2019
Unit Number: 4	30 <sup>th</sup> AUG 2019
Unit Number: 5	18 <sup>th</sup> SEPT 2019
Unit Number: 6	31 <sup>st</sup> SEPT 2019