**M sc Computer Science**

**Course Code-22UPCSC2C03       Credits: 4**

**Python Programming**

Course Objectives:

* To acquire programming skills in core Python
* To learn Strings and function
* To develop object oriented skills in Python
* To realize various Python Packages
* To develop web applications using Django

**Unit I**

Introduction : Fundamental ideas of Computer Science **-** Strings, Assignment, and Comments - Numeric Data types and Character sets – Expressions – Loops and Selection Statements: Definite iteration: the for Loop - selection: if and if-else statements - Conditional iteration: the while Loop

**Unit II**

Strings and Text Files: Accessing Characters and substrings in strings - Data encryption-Strings and Number systems- String methods – Text - Lists and Dictionaries: Lists – Dictionaries – Design with Functions: A Quick review - Problem Solving with top-Down Design - Design with recursive Functions - Managing a Program’s namespace - Higher-Order Functions

**Unit III**

Design with Classes: Getting inside Objects and Classes – Data-Modeling Examples – Building a New Data Structure – The Two – Dimensional Grid - Structuring Classes with Inheritance and Polymorphism - Graphical User  
Interfaces - The Behavior of terminal-Based programs  
and GUI-Based programs - Coding Simple GUI-Based programs - Windows and Window Components - Command Buttons and responding to events

**Unit IV**

Working with Python Packages: NumPy Library-Ndarray – Basic Operations – Indexing, Slicing and Iteration – Array manipulation - Pandas –The Series – The DataFrame - The Index Objects – Data Vizualization with Matplotlib – The Matplotlib Architecture – pyplot – The Plotting Window – Adding Elements to the Chart – Line Charts – Bar Charts – Pie charts

**Unit V**

Django: Installing Django – Building an Application – Project Creation – Designing the Data Schema - Creating an administration site for models - Working with QuerySets and Managers – Retrieving Objects – Building List and Detail Views

**Text Book:**

1. K.A. Lambert, “ Fundamentals of Python: first programs”, Second Edition, Cengage Learning, 2018 **(Unit - I, II and III)**
2. [Fabio Nelli](https://www.amazon.in/s/ref=dp_byline_sr_ebooks_1?ie=UTF8&field-author=Fabio+Nelli&text=Fabio+Nelli&sort=relevancerank&search-alias=digital-text), “Python Data Analytics: With Pandas, NumPy, and Matplotlib”,  Second Edition, Kindle Edition, 2018 **(Unit - IV)**
3. Antonio Mele, “Django 3 By Example”, Third Edition, 2020 **(Unit - V)**

**Course Outcomes**

**On the successful completion of the course, students will be able to**

|  |  |  |  |
| --- | --- | --- | --- |
| **CO1:** | To understand the Object Oriented Programming paradigm with the concept of objects and classes | **K1- K2** | **LO** |
| **CO2:** | Discover how to work with strings, functions, Inheritance and polymorphism techniques | **K3** | **IO** |
| **CO3:** | Evaluate the use of Python packages and web designing with Django | **K4- K5** | **HO** |

**K1- Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create**

**Mapping with Programme Outcomes**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** | S | S | M | S | M | S | S | S | S | M | S | S |
| **CO2** | S | S | S | M | S | S | S | S | S | S | M | S |
| **CO3** | S | M | S | S | M | S | M | S | S | M | S | S |

**S- Strong; M-Medium; L-Low**

**Course Code-22UPCSC2C06       Credits: 2**

**Python Programming Lab**

**Course Objectives:**

This course enables the students:

* To master the fundamentals of writing python scripts
* To create program using elementary data items
* To implement Python programs with conditionals and loops
* To use functions for structuring Python programs
* To develop web programming with Django

Implement the following in Python:

1. Program using elementary data items, lists, dictionaries and tuples
2. Program using conditional branches, loops
3. Program using functions
4. Program using classes and objects
5. Program using inheritance
6. Program using polymorphism
7. Program using Numpy
8. Program using Pandas
9. Program using Matplotlib
10. Program for creating dynamic and interactive web pages using forms

**Course Outcome:**

On the successful completion of the course, students will be able to

|  |  |  |  |
| --- | --- | --- | --- |
| **CO1:** | Understand conceptually how to use python programming for basic functions | K1-K2 | LO |
| **CO2:** | Implement and develop Python programs with conditionals loops, user defined functions and OOPS concepts | K3 | IO |
| **CO3:** | Develop programs using python packages Numpy, Pandas and Matplotlib | K4- K5 | HO |

**Master of Computer Application**

**Course Code-22UPCSC1C03       Credits: 4**

**Python Programming**

Course Objectives:

* To acquire programming skills in core Python
* To learn Strings and function
* To develop object oriented skills in Python
* To realize various Python Packages
* To develop web applications using Django

**Unit I**

Introduction : Fundamental ideas of Computer Science **-** Strings, Assignment, and Comments - Numeric Data types and Character sets – Expressions – Loops and Selection Statements: Definite iteration: the for Loop - selection: if and if-else statements - Conditional iteration: the while Loop

**Unit II**

Strings and Text Files: Accessing Characters and substrings in strings - Data encryption-Strings and Number systems- String methods – Text - Lists and Dictionaries: Lists – Dictionaries – Design with Functions: A Quick review - Problem Solving with top-Down Design - Design with recursive Functions - Managing a Program’s namespace - Higher-Order Functions

**Unit III**

Design with Classes: Getting inside Objects and Classes – Data-Modeling Examples – Building a New Data Structure – The Two – Dimensional Grid - Structuring Classes with Inheritance and Polymorphism - Graphical User  
Interfaces - The Behavior of terminal-Based programs  
and GUI-Based programs - Coding Simple GUI-Based programs - Windows and Window Components - Command Buttons and responding to events

**Unit IV**

Working with Python Packages: NumPy Library-Ndarray – Basic Operations – Indexing, Slicing and Iteration – Array manipulation - Pandas –The Series – The DataFrame - The Index Objects – Data Vizualization with Matplotlib – The Matplotlib Architecture – pyplot – The Plotting Window – Adding Elements to the Chart – Line Charts – Bar Charts – Pie charts

**Unit V**

Django: Installing Django – Building an Application – Project Creation – Designing the Data Schema - Creating an administration site for models - Working with QuerySets and Managers – Retrieving Objects – Building List and Detail Views

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2. [Fabio Nelli](https://www.amazon.in/s/ref=dp_byline_sr_ebooks_1?ie=UTF8&field-author=Fabio+Nelli&text=Fabio+Nelli&sort=relevancerank&search-alias=digital-text), “Python Data Analytics: With Pandas, NumPy, and Matplotlib”,  Second Edition, Kindle Edition, 2018 **(Unit - IV)**
3. Antonio Mele, “Django 3 By Example”, Third Edition, 2020 **(Unit - V)**

**Course Outcomes**

**On the successful completion of the course, students will be able to**

|  |  |  |  |
| --- | --- | --- | --- |
| **CO1:** | To understand the Object Oriented Programming paradigm with the concept of objects and classes | **K1- K2** | **LO** |
| **CO2:** | Discover how to work with strings, functions, Inheritance and polymorphism techniques | **K3** | **IO** |
| **CO3:** | Evaluate the use of Python packages and web designing with Django | **K4- K5** | **HO** |

**K1- Remember, K2- Understand, K3- Apply, K4- Analyze, K5- Evaluate, K6- Create**

**Mapping with Programme Outcomes**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** |
| **CO1** | S | S | M | S | M | S | S | S | S | M | S | S |
| **CO2** | S | S | S | M | S | S | S | S | S | S | M | S |
| **CO3** | S | M | S | S | M | S | M | S | S | M | S | S |

**S- Strong; M-Medium; L-Low**

**Course Code-22UPCSC1C05       Credits: 2**

**Python Programming Lab**

**Course Objectives:**

This course enables the students:

* To master the fundamentals of writing python scripts
* To create program using elementary data items
* To implement Python programs with conditionals and loops
* To use functions for structuring Python programs
* To develop web programming with Django

Implement the following in Python:

1. Program using elementary data items, lists, dictionaries and tuples
2. Program using conditional branches, loops
3. Program using functions
4. Program using classes and objects
5. Program using inheritance
6. Program using polymorphism
7. Program using Numpy
8. Program using Pandas
9. Program using Matplotlib
10. Program for creating dynamic and interactive web pages using forms

**Course Outcome:**

On the successful completion of the course, students will be able to

|  |  |  |  |
| --- | --- | --- | --- |
| **CO1:** | Understand conceptually how to use python programming for basic functions | K1-K2 | LO |
| **CO2:** | Implement and develop Python programs with conditionals loops, user defined functions and OOPS concepts | K3 | IO |
| **CO3:** | Develop programs using python packages Numpy, Pandas and Matplotlib | K4- K5 | HO |

1. Create a new Django project named mysite.

2. Add a new app named forms\_app.

3. Create a new file named forms.py in the forms\_app directory.

4. Add the following code to forms.py:

from django import forms class ContactForm(forms.Form):

name = forms.CharField()

message = forms.CharField(widget=forms.Textarea)

5. Create a new file named views.py in the forms\_app directory.

1. Add the following code to views.py:

from django.shortcuts import render from .forms import ContactForm

def contact\_view(request):

form = ContactForm()

if request.method == 'POST':

form = ContactForm(request.POST)

if form.is\_valid():

print(form.cleaned\_data)

return render(request, 'contact.html', {'form': form})

7. Create a new file named contact.html in the forms\_app directory.

8. Add the following code to contact.html: <!DOCTYPE html> <html> <head> <meta charset="utf-8"> <title>Contact Form</title> </head> <body> <h1>Contact Form</h1> <form method="POST"> {% csrf\_token %} {{ form.as\_p }} <button type="submit">Submit</button> </form> </body> </html>

9. Add the following code to the end of mysite/urls.py: from django.urls import path from forms\_app import views urlpatterns = [ path('contact/', views.contact\_view, name='contact'), ]

10. Run the Django development server and navigate to http://127.0.0.1:8000/contact/ to view the contact form