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## SECOND YEAR OF BACHELOR OF SCIENCE MAJOR PHYSICS REVISED SYLLABUS ACCORDING TO CBCS NEP2020

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COURSE TITLE: PROGRAMMING WITH PYTHON-II  
SEMESTER-IV,  
W.E.F. 2024-2025

Recommended by the Board of Studies in PHYSICS  
And

Approved by the Academic Council

Devrukh Shikshan Prasarak Mandal's

Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and  
Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh.  
Tal.Sangmeshwar, Dist. Ratnagiri-415804, Maharashtra, India

*Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce and Vid. Dadasaheb Pitre Science College, Devrukh (An  
Autonomous College Affiliated with University of Mumbai)*

Academic Council Item No: \_\_\_\_\_

Name of the Implementing Institute	:	Nya. Tatyasaheb Athalye Arts, Ved. S. R. Sapre Commerce, and Vid. Dadasaheb Pitre Science College (Autonomous), Devrukh. Tal. Sangmeshwar, Dist. Ratnagiri-415804,
Name of the Parent University	:	University of Mumbai
Name of the Programme	:	Bachelor of Science
Name of the Department	:	Physics
Name of the Class	:	Second Year
Semester	:	Four
Paper	:	I
No. of Credits	:	02
Title of the Course	:	Programming with Python-II
Course Code	:	PHSE401
Name of the Vertical in adherence to NEP 2020	:	SEC
Eligibility for Admission	:	Any 12 <sup>th</sup> Pass seeking Admission to Degree Programme in adherence to Rules and Regulations of the University of Mumbai and Government of Maharashtra
Passing Marks	:	40%
Mode of Assessment	:	Formative and Summative
Level	:	UG
Pattern of Marks Distribution for TE and CIA	:	60:40
Status	:	NEP-CBCS
To be implemented from Academic Year	:	2024-2025
Ordinances /Regulations (if any)		

## Syllabus for Second Year of Bachelor of Science

(With effect from the academic year 2024-2025)

**SEMESTER - IV**

**Paper No.– Major(SEC) – II**

**Course Title: Programming with Python-II**

**No. of Credits - 02**

**Type of Vertical: Major**

**CODE: PHSE401**

**Learning Outcomes Based on BLOOM's Taxonomy:**

After completing the course, the learner will be able to...		
Course Learning Outcome No.	Blooms Taxonomy	Course Learning Outcome
CLO-01	Remember	Know python concepts like files, exceptions, GUI, database connection etc.
CLO-02	Understand	Understand procedures to use files, regular expressions, GUI elements etc.
CLO-03	Apply	Handle common exceptions
CLO-04	Analyse	Develop GUI for an app
CLO-05	Evaluate	Different Module in Python Library
CLO-06	Create	Design the Expye experiment

COURSE CONTENT			
Module	Content	Credits	No. of Lectures
I	<p style="text-align: center;"><b>Theory</b></p> <ol style="list-style-type: none"> <li><b>1. Files:</b> Text Files, The File Object Attributes, Directories</li> <li><b>2. Exceptions:</b> Built-in Exceptions, Handling Exceptions, Exception with Arguments, User-defined Exceptions.</li> <li><b>3. Regular Expressions:</b> Concept of regular expression, various types of regular expressions, using match function.</li> <li><b>4. Object Oriented Programming , Modules in Python</b>  <b>Classes and Objects:</b> Overview of OOP (Object Oriented Programming), Class Definition, Creating Objects, Instances as Arguments, Instances as return values, Built-in Class Attributes, Inheritance, Method Overriding, Data Encapsulation, Data Hiding</li> <li><b>5. Modules:</b> Importing module, Creating and exploring modules, Math module, Random module, Time module</li> <li><b>6. Widgets:</b> Tkinter module , Label , Buttons , Checkbutton, Radiobuttons, Text box, Canvas , Entry, Frame, Text, Menu, LabelFrame, Scrolled Text Widgets , Message boxes , Spinbox . Handling Standard attributes and Properties of Widgets.</li> <li><b>7. Layout Management:</b> Designing GUI applications with proper Layout Management features.</li> </ol>	01	15

<b>II</b>	<p style="text-align: center;"><b>Practical</b></p> <ol style="list-style-type: none"> <li>1. Write a Python program to read an entire text file.</li> <li>2. Write a Python program to append text to a file and display the text.</li> <li>3. Write a Python program to read last n lines of a file.</li> <li>4. Design a class that store the information of student and display the same</li> <li>5. Implement the concept of inheritance using python</li> <li>6. Write a program to implement exception handling.</li> <li>7. Try to configure the widget with various options like: bg="red", family="times", size=18</li> <li>8. Try to change the widget type and configuration options to experiment with other widget types like Message, Button, Entry, Checkbutton, Radiobutton, Scale etc.</li> <li>9. Capture the two inputs signal using Expyes.</li> <li>10. RC Transient Circuit</li> <li>11. RC Integration Circuit</li> <li>12. Clamping with Diode</li> <li>13. Full wave Rectifier</li> <li>14. NPN <math>I_B</math> Vs <math>I_C</math> Plot</li> </ol>	<b>01</b>	<b>30</b>
	<b>Total</b>	<b>02</b>	<b>45</b>

**REFERENCE BOOKS:**

1. Think Python: Allen Downey, 2<sup>nd</sup> Edition, Shroff publication
2. Paul Gries, Jennifer Campbell, Jason Montojo, Practical Programming: An Introduction to Computer Science Using Python 3,
3. Pragmatic Bookshelf, 2/E 2014
4. James Payne, Beginning Python: Using Python 2.6 and Python 3, Wiley India, 2010

### Required Previous Knowledge

Basic Computer Knowledge would be beneficial but not essential.

### Access to the Course

The course is available for all the students admitted for Second Year Bachelor of Computer Science as a Major. Students seeking admission to other disciplines may select the course as a minor considering the terms and conditions laid down by the University of Mumbai, the Government of Maharashtra, and the college, from time to time.

### Forms of Assessment

The assessment of the course will be of Diagnostic, Formative and Summative type. At the beginning of the course diagnostic assessment will be carried out. The formative assessment will be used for the Continuous Internal Evaluation whereas the summative assessment will be conducted at the end of the term. The weightage for formative and summative assessment will be 60:40. The detailed pattern is as given below.

#### Term End Evaluation (30 Marks)

##### Question Paper Pattern

Time: 1 hr 15 min

Question No.	Unit/s	Question Pattern	Marks
Q.1	All	Fill in the Blanks	
Q.2	All	Theory questions (any five out of eight)	
Q.3	All	Find the output (any five out of eight)	
Q.4	All	Programming exercises (any five out of eight)	
<b>Total</b>			<b>30</b>

#### Internal Evaluation (20 Marks)

Sr. No.	Description	Marks
1	Mid Term Examination	
2	Classroom Performance based on self-study	
3	Assignments	
<b>Total</b>		<b>20</b>