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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-III,  
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

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	:	Third
Paper	:	I
No. of Credits	:	02
Title of the Course	:	Programming with Python-I
Course Code	:	PHSE201
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)	:	

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

## Syllabus for Second Year of Bachelor of Science

(With effect from the academic year 2024-2025)

**SEMESTER - III**

**Paper No.– (SEC) – I**

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

**No. of Credits - 02**

**Type of Vertical: Major**

**COURSE CODE: PHSE201**

**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 basic concepts of programming concepts.
CLO-02	Understand	Understand about basic constructs of programming such as data, operations, conditions, loops, functions etc.
CLO-03	Apply	Develop flowcharts for problem solving
CLO-04	Analyse	Develop logic for problem solving
CLO-05	Evaluate	Find the output of Python code snippets
CLO-06	Create	Write simple python programs involving control structures

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. Introduction:</b> What is a Program, The Python Programming Language, History, features, Installing Python, Running a Python program, the first program, Arithmetic operators, Values and types.</li> <li><b>2. Variables , Expressions and Statements :</b> Assignment statements , Variable Names and Keywords, Expressions and statements , Order of Operations</li> <li><b>3. Functions:</b> Function basics, Function Calls, Math Functions, Composition, Adding New Functions, Definitions and Uses, Flow of Execution, Parameters and Arguments, Local variables and parameters, return values.</li> <li><b>4. Conditionals and recursion :</b> Floor division and modulus, Boolean expression, Logical operators, Conditional expression, chained conditionals, Nested conditionals, Recursion</li> <li><b>5. Iterations :</b> Reassignment , updating variables , while statement, break statement</li> <li><b>6. Strings:</b> A String is a Sequence, len built in function, for Loop traversal , String Slices, Strings Are Immutable, Searching, String Methods, The <b>in</b> Operator, String Comparisons.</li> <li><b>7. Lists:</b> A list is a sequence, Lists are mutable, Traversing a List, List operations , List slices, List methods , Deleting elements , Lists &amp; Strings.</li> <li><b>8. Tuples:</b> Tuples, Accessing values in Tuples, Tuple Assignment, Tuples as return values, Variable-length argument tuples, Basic tuples operations, Concatenation.</li> <li><b>9. Dictionaries:</b> Creating a Dictionary, Accessing Values in a dictionary, Updating Dictionary, Deleting Elements from Dictionary, Properties of Dictionary keys, Operations in Dictionary.</li> </ol>	01	15

<b>II</b>	<b>Practical</b>		
	<ol style="list-style-type: none"> <li>1. Write a program to generate the Fibonacci series.</li> <li>2. Write a program to generate if a three digit number entered is an Armstrong number or not</li> <li>3. Write a function that reverses the user defined value.</li> <li>4. Write a recursive function to print the factorial for a given number</li> <li>5. Write a function that takes a character (i.e. a string of length 1) and returns True if it is a vowel, False otherwise.</li> <li>6. Define a function that computes the length of a given list or string.</li> <li>7. Write a program that takes two lists and returns True if they have at least one common member.</li> <li>8. Write a Python program to print a specified list after removing the 0<sup>th</sup>, 2<sup>nd</sup>, 4<sup>th</sup> and 5<sup>th</sup> elements.</li> <li>9. Write a Python program to clone or copy a list</li> <li>10. Write a Python script to sort (ascending and descending) a dictionary by value.</li> <li>11. Write a Python script to concatenate following dictionaries to create a new one.</li> <li>12. Write a Python program to sum all the items in a dictionary</li> </ol>	<b>01</b>	<b>30</b>
	Total	<b>02</b>	<b>45</b>

**REFERENCE BOOKS:**

1. Think Python: Allen Downey, 2<sup>nd</sup> Edition, Shroff publication
2. Magnus Lie Hetland, Beginning Python: From Novice to Professional,
3. Apress Paul Gries, et al., Practical Programming: An Introduction to Computer Science Using Python 3
4. Pragmatic Bookshelf, 2/E 2014 Data Communications and Networking – Behrouz A. Forouzan. Third Edition TMH.

**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 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>

### Grading Scale

The grading scale used is O to F. Grade O is the highest passing grade on the grading scale, and grade F is a fail. The Board of Examinations of the college reserves the right to change the grading scale.