

As Per NEP 2020

University of Mumbai



Title of the program

- A-** U.G. Certificate in **Computer Science**
- B-** U.G. Diploma in **Computer Science**
- C-** B.Sc. (**Computer Science**)
- D-** B.Sc. (Hons.) in **Computer Science**
- E-** B.Sc. (Hons. with Research) in **Computer Science**

Syllabus for

Semester – I & II

Ref: GR dated 20th April, 2023 for Credit Structure of UG

(With effect from the academic year 2024-25 progressively)

Vocational & Skill Enhancement Courses (VSEC)

Name of the Course: Introduction to Programming with Python

Sr. No.	Heading	Particulars
1	Description the course:	<p>Introduction:</p> <p>Introduction to Programming with Python Course serves as an entry point into the world of coding, introducing learners to the versatile and beginner-friendly Python language. Python is renowned for its readability and simplicity, making it an ideal choice for individuals taking their first steps in programming.</p> <p>Relevance:</p> <p>In today's digital era, programming skills are increasingly essential across various disciplines. Python, being an interpreted, high-level language, is relevant for diverse applications, from web development and data analysis to artificial intelligence and automation.</p> <p>Usefulness:</p> <p>The course provides a foundational understanding of Python syntax, data structures, and control flow, empowering learners to write functional and efficient code. Python's broad applicability makes the skills acquired in this course valuable for numerous programming tasks.</p> <p>Application:</p> <p>Upon completion, participants can apply Python to solve real-world problems, automate repetitive tasks, and create simple applications. The practical knowledge gained serves as a stepping stone for more advanced Python courses or specialization in areas like data science or web development.</p> <p>Interest:</p> <p>Python's user-friendly syntax and extensive libraries make it an enjoyable language for beginners. The course is designed to spark interest by combining theory with hands-on projects, fostering a passion for coding and problem-solving.</p> <p>Connection with Other Courses:</p> <p>Python is a gateway language that seamlessly integrates with other programming languages and technologies. The skills acquired in a Basic Python Programming Course</p>

		<p>provide a solid foundation for advanced programming languages and specialized courses in data science, machine learning, and more.</p> <p>Demand in the Industry:</p> <p>Python's popularity in the industry is soaring. Its versatility, readability, and extensive community support have led to its widespread adoption. Professionals proficient in Python are in high demand across various sectors, including technology, finance, healthcare, and academia.</p> <p>Job Prospects:</p> <p>Completion of this Course opens doors to entry-level positions in software development, quality assurance, data analysis, and scripting. Python developers are sought after for their ability to quickly prototype solutions and contribute to various stages of software development.</p>
2	Vertical:	VSC
3	Type:	Practical
4	Credits:	2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester)
5	Hours Allotted:	60 Hours
6	Marks Allotted:	50 Marks
7	<p>Course Objectives(CO):</p> <p>CO 1. Master Python features, execution, and diverse data types.</p> <p>CO 2. Demonstrate expertise in if statements, loops, and control statements.</p> <p>CO 3. Efficiently create and manipulate arrays, strings, and data structures.</p> <p>CO 4. Apply functions, modules, and strings for versatile programming tasks.</p> <p>CO 5. Effectively manage files, utilize regular expressions, and work with date and time.</p>	
8	<p>Course Outcomes (OC):</p> <p>OC 1. Apply Python features for diverse programming tasks confidently.</p> <p>OC 2. Implement control flow statements for precise program execution.</p> <p>OC 3. Manipulate arrays, strings, and data structures with precision and ease.</p> <p>OC 4. Create modular, efficient code using functions, modules, and strings.</p> <p>OC 5. Skillfully manage files, utilize regular expressions, and work with date and time for program efficiency.</p>	
9	<p>Modules:-</p> <p>Module (30 hours):</p> <p>Overview and Basic Elements of Python Programming: Features of Python, Execution of a Python Program, Flavours of Python, Innards of Python, Python Interpreter, Comments, Docstrings, IDLE, Data types, Dictionary, Sets, Mapping, Basic Elements of Python, Variables, Input Function, Output Statements, Command</p>	

	<p>Line Arguments. Operators, Precedence of Operators, Associativity of Operators</p> <p>Control Statements: The if statement, The if ... else Statement, The if ... elif ... else Statement, Loop Statement- while loop, for loop, Infinite loop, Nested loop, The else suite, break statement, continue statement, pass statement, assert statement, return statement.</p> <p>Arrays: Creating Arrays, Indexing and Slicing of Arrays, Basic Array Operations, Arrays Processing, Mathematical Operations on Array, Aliasing Arrays, Slicing and Indexing in NumPy Arrays, Basic slicing, Advanced Indexing, Dimensions and Attributes of an Array</p> <p>Functions: Function definition and call, Returning Results, Returning Multiple Values from a Function, Built-in Functions, Difference between a Function and a Method, Pass Value by Object Reference, Parameters and Arguments, Recursive Functions, Anonymous or Lambda Functions. Modules in Python.</p> <p>Strings: Creating Strings, Functions of Strings, Working with Strings, Formatting Strings, Finding the Number of Characters and Words, Inserting Substrings into a String.</p>
	<p>Module (30 hours):</p>
	<p>Exploring List, Tuples and Dictionaries: Lists, List Functions and Methods, List Operations, List Slices, Nested Lists, Tuples, Functions in Tuple.</p> <p>Working with Dictionaries: Creating a Dictionary, Operators in Dictionary, Dictionary Methods, Using for Loop with Dictionaries, Operations on Dictionaries</p> <p>Files in Python: Opening and Closing a File, Working with Text Files, , Working with Binary Files, The ‘with’ statement, Pickle in Python, The seek() and tell() Methods, Random Accessing of Binary Files, Zipping and Unzipping Files, Working with Directories</p> <p>Regular Expressions: Introduction, Sequence Characters in Regular Expressions, Special Characters in Regular Expressions, Using Regular Expression on Files, Retrieving Information from an HTML File</p> <p>Date And Time in Python: Time, Date, Date and Time Now, combining date and times, formatting date and time, Finding and comparing dates, Sorting dates, Knowing the Time taken by a Program, Working with Calendar Module</p>
<p>10</p>	<p>Text Books</p> <ol style="list-style-type: none"> 1. Practical Programming: An Introduction to Computer Science Using Python 3, Paul Gries , Jennifer Campbell, Jason Montojo, Pragmatic Bookshelf, 2nd Edition, 2014 2. Programming through Python, M. T Savaliya, R. K. Maurya & G M Magar, Sybgen Learning India, 2020
<p>11</p>	<p>Reference Books</p> <ol style="list-style-type: none"> 1. Python: The Complete Reference, Martin C. Brown, McGraw Hill, 2018 2. Beginning Python: From Novice to Professional, Magnus Lie Hetland, Apress, 2017

	<p>3. Programming in Python 3, Mark Summerfield, Pearson Education, 2nd Ed, 2018</p> <p>4. Python Programming: Using Problem Solving Approach, ReemaThareja, Oxford Univeristy Press, 2017</p> <p>5. Let Us Python, Yashwant. B. Kanetkar, BPB Publication, 2019</p>													
12	Internal Continuous Assessment: 40%	Semester End Examination: 60%												
13	<p>The internal evaluation will be determined by the completion of practical tasks and the submission of corresponding write-ups for each session. Each practical exercise holds a maximum value of 5 marks. The total evaluation, out of 50 marks, should be scaled down to a final score of 20 marks.</p> <hr/> <p>Total: 20 marks</p>	<p>A Semester End Practical Examination of 2 hours duration for 30 marks as per the paper pattern given below.</p> <p>Certified Journal is compulsory for appearing at the time of Practical Exam</p> <hr/> <p>Total: 30 Marks</p>												
14	<p>Format of Question Paper:</p> <p>Total Marks: 30 Duration: 2 Hours</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Question</th> <th style="width: 40%;">Practical Question Based On</th> <th style="width: 30%;">Marks</th> </tr> </thead> <tbody> <tr> <td>Q. 1</td> <td>Module 1</td> <td>12</td> </tr> <tr> <td>Q. 2</td> <td>Module 2</td> <td>12</td> </tr> <tr> <td>Q. 3</td> <td>Viva</td> <td>06</td> </tr> </tbody> </table>		Question	Practical Question Based On	Marks	Q. 1	Module 1	12	Q. 2	Module 2	12	Q. 3	Viva	06
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