Course Title: Scientific Computing with Python **Total Hours : 30 Hours**		**Department : Physics** **Credit: 2**
Course Description	Coding is the basic literacy in the digital era. Recent times, Python is one of the cutting-edge topic in programming. Python have its applications in variety of fields like scientific computing, web development, gaming, machine learning, Artificial Intelligence and academic research. Hence, this course is designed for the students to learn cutting-edge technology in order to cope up with the demands.	
Course Pre-requisites/ Co-requisites	Basic Computer knowledge	
Objectives:	1. To teach Python fundamentals like variables, loops, conditionals, and functions. 2. To sensitize students for scientific computation by solving real world issues. 3. To provide knowledge that is necessary in the technological job market.	
Expected Learning Outcome:	On completion of the course, students will have the ability to ➢ Understand the art of using computer to solve the problems. ➢ They can use it for everything from basic scripting to machine learning. ➢ It open up other job opportunities. So they can become a career Coder.	
Module. I	**Python basics**	**6 Hours**
Installation- Features of Python- Basic Syntax- Variable and Data Types		
Module. II	**Program Flow**	**6 Hours**
Operators- Conditional Statements- Control Statements: while and for statements, nested loops.		
Module. III	**Data Structure & File Handling**	**6 Hours**
List Comprehensions- Tulples- Dictionaries- Functions- Reading, Writing & Appending to Files.		

Module. IV	Python Classes and Objects	6 Hours
Concept of class, object and instances, Constructor, Inheritance- Programming using Oops support- Exception handling.		
Module. V	**Data Visualization**	**6 Hours**
Understanding on Data Visualization- Using Python Library for visualization: MatplotLib-Seaborn- plotly- Pie Chart- Histogram- Box Plot and other visualisation techniques.		

Books for Study and Reference

1. Bill Lubanovic, Introducing Python: Modern Computing in Simple Packages, First Edition, O'Reilly Media, 2014.

2. Martin C. Brown, Python: The Complete Reference, 2018

3. R. Nageswara Rao, Core Python Programming, 2018

4. Yashavant Kanetkar Let Us Python, 2019

5. Paul Deitel, Harvey Deitel, Python for Programmers: with Big Data and Artificial Intelligence Case Studies (Deitel Developer), 2018

Mode of Evaluation	**Practice Tests-40%,Continuous Assessment Tests-60%,** Assessment Test-1 20% Assessment Test-2 20% Assessment Test-3 20%
Course Coordinator	**Dr. R. Mariyal Jebasty**, Assistant Professor in Physics, Wavoo Wajeeha Women's College of Arts & Science, Kayalpatnam.
Course Instructors	**Mrs. Pushpa**, Assistant Professor in Physics, Wavoo Wajeeha Women's College of Arts & Science, Kayalpatnam. **Dr. S. Usharani** , Assistant Professor in Physics, Wavoo Wajeeha Women's College of Arts & Science, Kayalpatnam.