SYLLABUS

of the

Value-added Course

PYTHON Computing for all

(PHYVAC 001)

(w.e.f. 2022-2023)

Offered by:

Department of Physics
PanskuraBanamali College (autonomous)
Panskura R.S., Purba Medinipur, West Bengal 721 152

Information on the Course

Course Type: Value Added Course
Course Duration: Total 32 Hours(approx. 2 Months)
Medium of Instruction: English/ Bengali or both

Mode of Classes: Blended Mode
[20 Lectures+ Practice in Computer Laboratory (12 Hrs.)]

Duration of each lecture: 1 Hour

Intake:100

Eligibility:UG and PG students of any subject, Research Scholars, enthusiasts
[No prior knowledge in Computation is required. Elementary knowledge in mathematicswill help.]

Course Fees: Rs. 500(Rs. Five hundred only)

Main Course Instructor:
Dr. *Abhijit Kar Gupta*, Department of Physics, Panskura Banamali College

[Possible other Instructors: Dr. *Kisor Mukhopadhyay* (Department of Physics, Prabhu Jagatbandhu College, Andul) by invitation.]

Course Evaluation:

Continuous Internal Assessment/ Evaluation will be based on attendance, daily performance, and online quiz in Google form. Certificates will be provided after the successful completion of the course.

Contact:

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Outline of the Course

Lectures (1 Hr. each):

Lect01: Introduction to Python. Download, Install, Type, Calculate
Lect02: Variables, Data types, Built-in Modules
Lect03: Examples, usages of some Built-in modules: Math, Random, Time, Calendar, OS
Lect04: Input, Output data, file creation.

Practice and Problem solving at Computer Lab:

Saturday, 15:00 – 17:00 Hrs.

Lectures (1 Hr. each):

Lect05: Loop structure in Python computing
Lect06: Control Structure in Python
Lect07: Problem solving
Lect08: Function creation, Special Python functions

Practice and Problem solving at Computer Lab:

Saturday, 15:00 – 17:00 Hrs.

Online Lectures (1 Hr. each):

Lect09: Python Data Structure – I (List, Tuple, String)
Lect10: Python Data Structure – IV (Set, Dictionary)

Practice and Problem solving at Computer Lab:

Saturday, 15:00 – 17:00 Hrs.

Online Lectures (1 Hr. each):

Lect 11: Drawing with Turtle
Lect 12: Introduce NumPy (Numerical Python), NumPy arrays

Lect 13: NumPy functions, polynomials, random numbers, range of numbers
Lect 14: SciPy (Scientific Python) modules, Useful functions, Statistics with SciPy
Lect15: Curve fitting, Interpolation of Data with NumPy, SciPy

Practice and Problem solving at Computer Lab:

Saturday, 15:00 – 17:00 Hrs.

Online Lectures (1 Hr. each):

Lect16: Plotting with Matplotlib I (xy-plot)
Lect17: Plotting with Matplotlib III (Contour plot, 3D plot)

Practice and Problem solving at Computer Lab:

Saturday, 15:00 – 17:00 Hrs.

Online Lectures (1 Hr. each):

Lect18: Structured Data, Data Tables: Series with Pandas
Lect19: Structured Data, Data Tables: DataFrame with Pandas
Lect 20: CSV files, Excel sheet by Pandas, Web scrapping (Tables, Data from internet)

Practice and Open discussions:

Saturday, 15:00 – 17:00 Hrs.

Books and Online resources:

1. *An Introduction to Python* by Guido van Rossum, Pub: Network Ltd.
2. *Scientific Computing in Python* (3rd edn) by Abhijit Kar Gupta, Pub: Techno World, Kolkata
3. *Python Computing* (in Bengali, 2nd edn) by Abhijit Kar Gupta, Pub: Tritiyoparisar, Kolkata
4. *Python Computing: Fundamentals and Applications* by Abhijit Kar Gupta, Pub: Techno World, Kolkata (in press)
5. Python Official Site: www.python.org
6. For External packages: numpy.org, scipy,org, matplotlib.org, pandas.pydata.org