University of Houston

HPE Data Science Institute

Syllabus: Scientific Computing With Python

Instructor: Jerry Ebalunode, Ph.D., MBA.

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Office Hours: Online and By appointment

Location: Online

Website: https://secure.hpedsi.uh.edu/training

Course description: Python is an easy to learn, powerful programming language. It has efficient high-level data structures that make it suitable rapid application development. Topics covered in this session will include data types, conditional and loop statements, functions, input/output, modules, classes and exceptions. Upon completion of this tutorial series, participants should be able to understand existing scientific python codes as well as write their own python applications. This training session also introduces participants to scientific computing extensions of python like scipy and sci-kit for use in high performance computing, and machine learning. Using advanced python libraries like regular expressions, numpy, pandas, seaborn, scikit-learn, etc for every day scientific computing are also taught.

Prerequisites: Participants are expected to have a working knowledge of the UNIX/Linux environment or should have taken Cluster computing course from HPEDSI dept.
*Note for HPC certificate – you should have completed the Linux/cluster computing course or passed the placement test to get credit for this course towards HPC certificate.

Textbook: None Required, but for those interested.

(1) Introduction to Computing Using Python: An Application Development Focus, Ljubomir Perkovic
(2) Numerical Python: A Practical Techniques Approach for Industry, Robert Johansson

Lecture notes would be provided through course website.

Evaluation (tentative): Attendance: 10%, In-class/HW assignments: 40% , final exam: 50% (last day of class)
Attendance Requirement:

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Good standing on Attendance grade (>50%) would be required to see new course materials, homework assignments, and exams/projects as the course proceeds.
Also, for students interested in getting a badge or certificate for completing this course, an attendance grade of at least 75% of the class meeting sessions is required, to be qualified for passing the course and getting the badge.

Tentative Course Schedule:

Week 1	**Introduction to Python, Algorithmic Thinking**	
Week 2	**Imperative Programming, Strings, List, Tuples, Sets, Regular Expressions**	
Week 3	**Dictionaries, Files, Numpy, Scipy, Sympy, Matplotlib**	
Week 4	**Pandas, Seaborn, Final Exam or Project**	

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