Syllabus

ASTR 302: Python for Astronomy (Winter '21)

M-W, 2:30-3:50, Virtual
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ASTR 302, "Python for Astronomy", is a course designed to teach how to effectively use Python for research and astronomical data analysis. We begin with a gentle introduction to key tools and libraries used in astronomy, use these to analyze data (from kilobytes to tens of gigabytes!), visualize (sometimes large) datasets, automate analyses, and apply what we've learned to reproduce results of some key astronomy papers.

This course assumes you know Python and related astronomy libraries at the ASTR 300 level. It will give you the broad foundation needed to proceed to "ASTR 324: Introduction to Astrostatistics and Machine Learning in Astronomy", or ASTR 497 "Big Data in Astronomy: Hands-on with Large Surveys", or independent research projects.

Grading: Homeworks (60%) and a Final Project (40%).

When	***Topic***	***Notes***
Jan 6	Getting Started: Why Python for Astronomers?	
Jan 11	Basic Python Refresher	
Jan 13	Group work	
Jan 18	*-- no class --*	holiday
Jan 20	How to be organized and collaborative: git and github	hw1 due
Jan 25	Group work	
Jan 27	Group work	
Feb 1	Interactive Data Analysis: Jupyter	
Feb 3	Group work	hw2 due
Feb 8	Introduction to Databases for Astronomers	
Feb 10	Group work	hw3 due
Feb 15	*-- no class --*	holiday
Feb 17	Group work	
Feb 22	Remotely querying astronomical archives	

Feb 24	Group Work	hw4 due
Mar 1	Array Programming in Python	
Mar 3	Project pitches	hw5 due
Mar 8	Project Hackday #1	
Mar 10	Project Hackday #2	
Mar 19		*Final Project Due*