Syllabus – Intermediate Python3 workshop

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| 2019-05-07 | initial material selection |
| 2019-05-16 | Started writing jupyter notebooks |
| 2019-05-26 | Add topics |
| 2019-06-19 | Add topics |
| 2019-06-23 | Review with Oren |

The time scope is 3 days ,4 academic hours each, followed by 2 hours hands-on, and rest of day dedicated for homework (aka *the mission)*.

This workshop is for people who already used python before and have basic knowledge. We will *not* teach the basics of python and how to install it on your computer.

# Teasing: What Does It Take To Be An Expert At Python? https://youtu.be/7lmCu8wz8ro

*We will use jupyter notebook in addition to PowerPoint*

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|  | topics | Estimated time [minutes] | comments |
| Day 1 Basic knowledge | * Introduction to the course * Logging * Unit Testing * The memory model   + Argument passing   + Garbage collection * Virtual environments and Packages * Errors and Exceptions * Exception Handling * Pip, pypi * Profiling (and optimization) * Argument passing \*args, \*\*kwargs |  | If needed, talk on some basics:   * mutable/immutable (tuple vs. list) * Only immutable can be keys to dict |
| Introducing popular packages | * Scrapy, SciPy ,NumPy ,scikit-learn, SqlAlchemy * Project description | 50 | <https://www.quora.com/What-is-the-relationship-among-NumPy-SciPy-Pandas-and-Scikit-learn-and-when-should-I-use-each-one-of-them> |
| Project description | * Describe what the mission is and some ground rules | 60 |  |
| Day 2  Multi thread, advanced topics | * Multi-threading and the GIL * Multiprocessing * Async. Await * Subprocess module * Generators and Iterator Protocol * Decorators (class and method based) * Comprehensions * The built-ins * Regular Expressions |  | <https://docs.python.org/3/library/functions.html> |
| Day 3  more advanced topics if have enough time. | * Context Managers * Magic method (\_\_init\_\_ . .. ) called data model objects * Remote development, remote debugging * Class method vs. static method * The Collections module * Type checking: mypy * Alternative implementations (jython, pypy) * Profiling (hands on) |  | <https://www.jetbrains.com/help/pycharm/remote-debugging-with-product.html>  cProfile (builtin) |

Argument passing \*args, \*\*kwargs

Private by convention \_privateData \_\_privateSystemData

Class variables, class methods

Class inheritance. How to call super class methods (isinstance(), issubclass() )

Collecting from lists in <https://www.quora.com/What-are-the-advanced-topics-in-python>

List of topics to pick from

<http://www.cs.fsu.edu/~carnahan/cis4930sp17/index.html>

The blue items are more related to libraries

* *Python Errors and Exceptions*
* *Python Exception Handling*
* ~~Python 3 Extensions~~
* Python Tools
* ~~XML Processing in Python3~~
* ~~Networking in python 3~~
* ~~Sending mail with Python 3~~
* ~~GUI Programming in Python 3~~
* ~~CGI Programming in Python~~
* *Python Multi-threading*
* *Multiprocessing with Python*
* *Python Subprocess module*
* *Python Regular Expressions*
* *SciPy with Python*
* *NumPy with Python*
* *Accessing Database with Python*
* *Python Image Processing*
* *Unit Testing with Python*
* *Logging in Python*
* Serialization in Python
* Python Debugger
* ~~Python Forensics~~
* *Python Virtual Environments and Packages*
* Important Python Libraries
* Best Python Web frameworks
* ~~Python Django Framework~~
* Python Pandas
* Python Flask
* ~~Python PyQT~~
* *Python Generators and Iterator Protocol*
* Python Meta-programming
* Python Descriptors
* Python Decorators (class and method based)
* Python Buffering Protocol
* Python Comprehensions
* Python WSGI protocol
* Python Context Managers

My jupyter server setup at <http://jupiter-iem-technion.westeurope.cloudapp.azure.com/notebooks/>

And also built jupyterHub which is required for multiuser

[*https://hub.docker.com/r/jupyter/datascience-notebook*](https://hub.docker.com/r/jupyter/datascience-notebook)

Installed Docker on new Azure machine. Run jupyter container in it.

jupiter-iem-technion.westeurope.cloudapp.azure.com

VM in Azure

Docker Engine

Jupyter container

Your browser

kernel