

# Center for Technical Education : Introduction to Programming with Python

## Course Summary

- ❑ Subject : Introduction to Programming with Python
- ❑ Level : Beginner to Intermediate
- ❑ Objective : To introduce students to multiple programming paradigms, object oriented concepts and functional programming using the language Python.
- ❑ Workload : 5 - 10 hours/week(includes three one hour lectures.)

## Instructors

Aditya Lahiri, Arif Ahmed, Gargi Balasubramaniam, Sharan Yalburgi and Utkarsh Rai.

## Course Requirements

Install a text editor, preferably VS Code (else Atom or Sublime). Highly recommended to use a UNIX based operating system (like macOS, Linux). Please install some linux distro (preferably based on ubuntu) and if not possible, set it up on virtualbox.

## Weekly Schedule

At the end of every week there will be a simple assignment which will primarily focus on what was taught that week. Please note that this does **NOT** include the mini-projects. Week 6, 7 and 8 will be for discussion of the current mini-project implementation.

	Week	Topics	Resources
	1	<ul style="list-style-type: none"><li>● Setting up a python programming environment and shell basics.</li><li>● Working with Jupyter Notebooks/Lab</li><li>● Basics : Statements, Expressions, Variables</li></ul>	Lectures/Notebook
	2	<ul style="list-style-type: none"><li>● Boolean Logic</li><li>● Iterables(Lists, Tuples, Sets), Loops, Dictionaries.</li><li>● Conditionals, List Comprehension, Iterators.</li></ul>	Lectures/Notebook
	3	<ul style="list-style-type: none"><li>● Input/Output (User and File I/O)</li><li>● Functions</li></ul>	Lectures/Notebook

		<ul style="list-style-type: none"> <li>• Modular Programming</li> </ul>	
	4	<ul style="list-style-type: none"> <li>• Classes</li> <li>• Creating instances and managing attributes and methods</li> <li>• Mutable/Immutable objects.</li> </ul>	Lectures/Notebook
	5	<ul style="list-style-type: none"> <li>• Standard library – os, sys, itertools, re</li> <li>• Intro to Git and Github</li> </ul>	Lectures/Notebook
	6	Mini-Project I <20% of total grade>	PDF with hints and grading rubric
	6	<ul style="list-style-type: none"> <li>• Good programming practices(PEP8,commenting, docstrings,etc)</li> <li>• Getting comfortable with using new libraries</li> </ul>	Lectures/PDF
	7	Mini-project II <20% of total grade>	PDF with hints and grading rubric
	8	<ul style="list-style-type: none"> <li>• Introduction to web applications and servers</li> <li>• Creating a web application using the Django framework</li> </ul>	Lectures/Notebook
	9	Group Project <20% of total grade>	PDF with hints and grading rubric
	10	<ul style="list-style-type: none"> <li>• Unit Testing with PyTest</li> <li>• Testing your code with continuous integration services</li> <li>• Scientific computing(NumPy, Pandas, basic matplotlib)</li> <li>• Buffer: In case some classes are missed.</li> </ul>	Lectures/Notebook
	11	Final Project <25% of total grade>	

Weekly Assignments: 15%

## **Assessment**

1. No attendance requirement.
2. All graded components are mini-projects.
3. Mini-projects will be uploaded to private repositories on GitHub. Instructors will be given access permission. Code will be reviewed and grade given according to rubric.