🐍**Python Programming Notes – AetherCode (Notion Template)**

⛈️Cover Page

Course Title: Python Programming – Simplicity and Power Combined\ **Prepared By:** AetherCode Team\ **Website:** www.aethercode.com

> *"Code. Notes. Clarity."*

🌟Table of Contents

Introduction

Python is a high-level, interpreted, general-purpose programming language. Created by Guido van Rossum, it's known for its clean syntax and readability, making it ideal for beginners and professionals alike.

💐Features of Python

- Interpreted and dynamically typed
- High-level and simple syntax
- Huge standard library
- Portable and open-source
- Supports OOP and functional programming
- Ideal for data science, web dev, AI, and scripting

Python Basics

```
print("Hello, Python!")
```

- No need to declare variables
- Uses indentation to define blocks

Data Types and Variables

Type	Example
int	x = 10
float	pi = 3.14
str	name = "Alice"
bool	flag = True
list	nums = [1,2,3]
dict	student =

Operators

- Arithmetic: `+ - * / % ** //`
- Relational: `== != > < >= <=`
- Logical: `and or not`
- Membership: `in`, `not in`
- Identity: `is`, `is not`

Control Statements

```
x = 5
if x > 0:
    print("Positive")
elif x < 0:
    print("Negative")
else:
    print("Zero")
```

- Loops: `for`, `while`
- `break`, `continue`, `pass`

🦝Functions

```
def greet(name):
    return f"Hello {name}"
```

- Arguments, default values, keyword args
- `*args`, `**kwargs`

🦏Modules and Packages

```
import math
print(math.sqrt(25))
```

- `from module import func`
- Custom modules using `.py` files

✨Strings and Lists

```
name = "Python"
print(name.upper())

nums = [1, 2, 3]
nums.append(4)
```

- Indexing, slicing, methods

🪱Tuples, Sets, and Dictionaries

- Tuple: `t = (1, 2, 3)` – Immutable
- Set: `s = {1, 2, 3}` – Unique items
- Dict: `d = {"key": "value"}` – Key-value mapping

🕊️File Handling

```
with open("file.txt", "w") as f:
    f.write("AetherCode")
```

- Modes: `r`, `w`, `a`, `r+`
- Read with `read()`, `readline()`, `readlines()`

✨Object-Oriented Programming

```
class Animal:
    def __init__(self, name):
        self.name = name
    def speak(self):
        print(f"{self.name} makes a sound")
```

- Inheritance, polymorphism, encapsulation

🦗Exception Handling

```
try:
    x = 10 / 0
except ZeroDivisionError as e:
    print("Cannot divide by zero")
finally:
    print("Done")
```

⚡Lambda and Map/Filter/Reduce

```
add = lambda x, y: x + y

squares = list(map(lambda x: x**2, [1, 2, 3]))
```

🦅Libraries Overview

Library	Use Case
NumPy	Numerical computing
Pandas	Data analysis
Matplotlib	Data visualization
Flask	Web development
Django	Full-stack web apps
TensorFlow	Machine Learning

🦜 Summary

Python is a multi-paradigm language with widespread use in data science, web development, automation, and more. Its concise syntax makes it perfect for rapid development.

Next: Build websites with HTML – the foundation of web development.