

**BSSE2301 SOFTWARE ENGINEERING MINI PROJECT 2025**

## Python programming learning course outline modules

Modules	Sub modules	Mentors/Lecturers
<b>Module 1:</b> Introduction to Python  19th - 23rd May 2025	<b>Getting Started with Python</b>  Introduction to Python and its history <ul style="list-style-type: none"><li>Installing Python and setting up the environment</li></ul> Using Python IDEs (e.g., PyCharm, VS Code, Jupyter Notebook, Anaconda)	Geoffrey: jeff.geoff.cis@gmail.com
	<b>Basic Syntax and Variables</b> <ul style="list-style-type: none"><li>Python syntax and conventions</li><li>Variables and data types</li><li>Basic input and output operations</li></ul>	Livingstone: ndigezzalivingstone2@gmail.com
	<b>Control Structures</b>  Conditional statements (if, elif, else) <ul style="list-style-type: none"><li>Loops (for, while)</li><li>Comprehensions (list, dictionary comprehensions)</li></ul>	Geoffrey: jeff.geoff.cis@gmail.com
<b>Module 2: Data Structures</b>  19th - 23rd May 2025	<b>Lists, Tuples, and Sets</b>  Introduction to lists and basic operations <ul style="list-style-type: none"><li>Tuples and their uses</li><li>Sets and set operations</li></ul>	Livingstone: ndigezzalivingstone2@gmail.com
	<b>Dictionaries</b> <ul style="list-style-type: none"><li>Creating and using dictionaries</li><li>Dictionary methods and operations</li></ul>	Geoffrey: jeff.geoff.cis@gmail.com
	<b>Advanced Data Structures</b> <ul style="list-style-type: none"><li>Nested data structures</li><li>Collections module (namedtuple, defaultdict, Counter, deque)</li></ul>	Livingstone: ndigezzalivingstone2@gmail.com
<b>Module 3: Functions and Modules</b>  26th - 30th May 2025	<b>Defining Functions</b> <ul style="list-style-type: none"><li>Function syntax and parameters</li><li>Return values</li><li>Lambda functions</li></ul>	Geoffrey: jeff.geoff.cis@gmail.com

	<b>Modules and Packages</b> <ul style="list-style-type: none"> <li>Importing modules</li> <li>Creating and using custom modules</li> <li>Understanding and using packages</li> <li>(e.g., pip and PyPI)</li> </ul>	Livingstone: ndigezzalivingstone2@gmail.com
	<b>Error Handling</b> <ul style="list-style-type: none"> <li>Exception handling with try, except, else, and finally</li> <li>Custom exceptions</li> </ul>	Geoffrey: jeff.geoff.cis@gmail.com
<b>Module 4: Object-Oriented Programming (OOP)</b>  26th - 30th May 2025	<b>Classes and Objects</b> <ul style="list-style-type: none"> <li>Defining classes and creating objects</li> <li>Instance and class variables</li> <li>Methods (instance, class, and static methods)</li> </ul>	Livingstone: ndigezzalivingstone2@gmail.com
	<b>Inheritance and Polymorphism</b> <ul style="list-style-type: none"> <li>Inheritance and method overriding</li> <li>Polymorphism and method resolution order</li> <li>Abstract classes and interfaces</li> </ul>	Geoffrey: jeff.geoff.cis@gmail.com
	<b>Advanced OOP Concepts</b> <ul style="list-style-type: none"> <li>Encapsulation and data hiding</li> <li>Magic methods and operator overloading</li> <li>Composition vs. inheritance</li> </ul>	Livingstone: ndigezzalivingstone2@gmail.com
<b>Module 5: File Handling</b>  2nd - 6th May 2025	<b>Reading and Writing Files</b> <ul style="list-style-type: none"> <li>Working with text files</li> <li>Handling CSV files</li> <li>JSON and XML file processing</li> </ul>	Geoffrey: jeff.geoff.cis@gmail.com
	<b>File and Directory Operations</b> <ul style="list-style-type: none"> <li>Navigating the file system</li> <li>File and directory management (os and shutil modules)</li> </ul>	Livingstone: ndigezzalivingstone2@gmail.com
<b>Module 6: Data Science with Python</b> 2nd - 6th June 2025	<b>Introduction to NumPy</b> <ul style="list-style-type: none"> <li>Creating and manipulating arrays</li> <li>Mathematical operations with NumPy</li> </ul>	Geoffrey: jeff.geoff.cis@gmail.com

	<b>Pandas for Data Analysis</b>  DataFrames and Series <ul style="list-style-type: none"> <li>• Data manipulation and analysis with</li> <li>• Pandas</li> </ul>	Livingstone: ndigezzalivingstone2@gmail.com
	<b>Data Visualization</b> <ul style="list-style-type: none"> <li>• Matplotlib for basic plotting</li> <li>• Advanced visualizations with Seaborn</li> </ul>	Geoffrey: jeff.geoff.cis@gmail.com
<b>Module 7: Machine Learning basics</b>  9th - 13th June 2025	<b>Introduction to Machine Learning</b> <ul style="list-style-type: none"> <li>• Supervised Learning</li> <li>• Unsupervised Learning</li> <li>• <i>Model Selection and Validation</i></li> <li>• <i>Advanced Topics (Neural Networks and Deep Learning, Natural Language Processing (NLP))</i></li> </ul>	Livingstone: ndigezzalivingstone2@gmail.com  Geoffrey: jeff.geoff.cis@gmail.com
	<ul style="list-style-type: none"> <li>• <b>Project: Machine Learning</b></li> </ul>	Geoffrey&Livingstone: jeff.geoff.cis@gmail.com
<b>Module 8: Web Development with Python</b> 16th - 20th June 2025	<b>Introduction to Web Development</b>  Understanding web technologies <ul style="list-style-type: none"> <li>• Setting up a web server with Flask or</li> <li>• Django</li> </ul>	Livingstone: ndigezzalivingstone2@gmail.com
	Building Web Applications  Creating routes and views <ul style="list-style-type: none"> <li>• Handling forms and user input</li> <li>• Integrating databases (SQL,</li> <li>• PostgreSQL, MySQL / MariaDB)</li> </ul>	Geoffrey: jeff.geoff.cis@gmail.com
16th - 20th June 2025	<b>Advanced Web Development</b>  User authentication and authorization <ul style="list-style-type: none"> <li>• REST APIs with Flask or Django REST</li> <li>• Framework</li> </ul>	Geoffrey: jeff.geoff.cis@gmail.com
<b>Module 9: Working with APIs</b> 23th - 27th June 2025	<b>Introduction to APIs</b> <ul style="list-style-type: none"> <li>• Understanding RESTful APIs</li> <li>• Consuming APIs with requests module</li> </ul>	Livingstone: ndigezzalivingstone2@gmail.com

	<b>Creating APIs</b> <ul style="list-style-type: none"> <li>• Building APIs with Flask-RESTful or Django REST Framework</li> <li>• Authentication and versioning of APIs</li> </ul>	Livingstone: ndigezzalivingstone2@gmail.com
<b>Module 10: Automation and Scripting</b> 23th - 27th June 2025	<b>Automating Tasks with Python</b>  Writing scripts for task automation <ul style="list-style-type: none"> <li>• Scheduling tasks with cron jobs or task schedulers</li> </ul>	Geoffrey: jeff.geoff.cis@gmail.com
	<b>Web Scraping</b> <ul style="list-style-type: none"> <li>• Basics of web scraping with BeautifulSoup</li> <li>• Advanced scraping with Scrapy</li> </ul>	Livingstone: ndigezzalivingstone2@gmail.com
<b>Module 11: Testing and Debugging</b> 30th June - 4th July 2025	<b>Testing in Python</b>  Writing unit tests with unittest and pytest <ul style="list-style-type: none"> <li>• Test-driven development (TDD)</li> <li>• concepts</li> </ul>	Geoffrey: jeff.geoff.cis@gmail.com
	<b>Debugging Techniques</b>  Using debugging tools (pdb, logging module) <ul style="list-style-type: none"> <li>• Best practices for debugging and troubleshooting</li> </ul>	Livingstone: ndigezzalivingstone2@gmail.com

<b>Module 12: Advanced Topics</b> 7th - 11th July 2025	<b>Concurrency and Parallelism</b>  Threading and multiprocessing <ul style="list-style-type: none"> <li>Asynchronous programming with</li> <li>asyncio</li> </ul>	Geoffrey: jeff.geoff.cis@gmail.com
14th - 18th July 2025	<b>Performance Optimization</b>  Profiling and optimizing code <ul style="list-style-type: none"> <li>Memory management and best</li> <li>practices</li> </ul>	Livingstone: ndigezzalivingstone2@gmail.com
21th - 25th July 2025	Deployment and DevOps <ul style="list-style-type: none"> <li>Deploying applications with Docker</li> <li>Continuous Integration and Continuous Deployment (CI/CD) practices</li> <li>Best practices</li> </ul>	Geoffrey: jeff.geoff.cis@gmail.com

### Weekly Timetable

Total weekly contact hours 9.5 hours

Time	Monday	Tuesday	Wednesday	Thursday	Friday
09:00 - 11:00	Geoffrey: jeff.geoff.cis@gmail.com	----	Geoffrey: jeff.geoff.cis@gmail.com	----	Geoffrey: jeff.geoff.cis@gmail.com
14:00-16:00	Livingstone: ndigezzalivingstone2@gmail.com	----	Livingstone: ndigezzalivingstone2@gmail.com	----	Livingstone: ndigezzalivingstone2@gmail.com

Note-

**Group Project and Supervision Allocation- This will be done in the fifth week**

### Group Formation

Size: Each group will consist of 4-5 members.

### Online class

Platform: Online classes will be conducted via Zoom.

Schedule: Classes will follow the regular timetable.

Access: The Zoom links will be the same thought out the recess program

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**Links:**

**Morning: Register in advance for this meeting:**

**Afternoon: Register in advance for this meeting**

*After registering, you will receive a confirmation email containing information about joining the meeting.*

**Guido van Rossum** (Creator of Python):

"Python is an experiment in how much freedom programmers need. Too much freedom and nobody can read another's code; too little and expressiveness is endangered."