

# Vocational Course on Python Mastery

The **objective** of this course is to equip students with the fundamental knowledge and practical skills in Python programming and its applications, enabling them to confidently apply Python for various tasks, including web development, data analysis, and machine learning.

**Instructor Qualification:** B.Tech with 3 Years of experience

**Payout:** 20,000-1,00,000 INR monthly on successful completion of all four semesters.

## **Why should you opt for this course?**

Opting for this course on Python programming offers several compelling reasons:

- 1. Versatility and Relevance:** Python is a versatile and widely used programming language in various fields and industries. By learning Python, you gain a valuable skill that is highly relevant in today's job market, irrespective of your chosen discipline.
- 2. Career Opportunities:** Proficiency in Python opens up a wide range of career opportunities. It is in demand in fields such as software development, data science, web development, machine learning, automation, and more. Adding Python to your skillset can enhance your employability and career prospects.
- 3. Data Manipulation and Analysis:** Python provides powerful libraries like Pandas and NumPy, making it an excellent choice for data manipulation, analysis, and visualisation. Whether you work with scientific data, business data, or any other type of data, Python offers tools and frameworks to efficiently handle and analyze it.
- 4. Automation and Efficiency:** Python's simplicity and readability make it an ideal language for automating repetitive tasks and streamlining workflows. Learning Python empowers you to write scripts, automate processes, and increase efficiency in your work, regardless of your field.
- 5. Collaboration and Community Support:** Python has a vast and supportive community of developers and enthusiasts. By opting for this course, you become part of this community and gain access to resources, forums, and libraries that can aid your learning and problem-solving.
- 6. Interdisciplinary Applications:** Python's versatility makes it applicable across disciplines. Whether you're in the sciences, humanities, business, or arts, Python can be utilised for tasks such as data analysis, simulation, text processing, web development, and more. It provides you with tools to explore the intersection of programming with your field of interest.
- 7. Creative Expression and Innovation:** Python offers libraries and frameworks for creative coding, digital arts, and interactive media. By learning Python, you can express your creativity through coding, develop interactive projects, and explore innovative ways to merge technology with your artistic pursuits.
- 8. Personal Development and Problem-Solving Skills:** Learning Python enhances your logical thinking, problem-solving abilities, and computational skills. It trains you to break down complex problems into smaller, manageable steps and develop efficient algorithms to solve them.
- 9. Future-Proofing:** Python has consistently gained popularity and is projected to continue growing in the coming years. By opting for this course, you invest in a programming language with a promising future, ensuring that your skills remain relevant and adaptable to evolving industry trends.

10. **Flexibility and Ease of Learning:** Python is known for its user-friendly syntax and readability, making it a great language for beginners. It prioritises simplicity and ease of use, making the learning process smoother and more enjoyable.

**In summary, opting for this Python programming course offers you a valuable skill set, numerous career opportunities, and the ability to apply programming concepts across disciplines. It equips you with practical and in-demand skills that can significantly enhance your professional growth and personal development.**

### **Who is this course for?**

1. **Computer Science and Engineering Students:** Students studying computer science, software engineering, or related fields can benefit from this course to strengthen their programming skills and gain proficiency in Python, which is widely used in these disciplines.
2. **Data Science and Analytics Students:** Students pursuing degrees in data science, business analytics, or similar fields can opt for this course to learn Python for data manipulation, analysis, and visualisation. Python is a popular language in the data science community, and proficiency in Python is highly sought after in these domains.
3. **Natural and Social Sciences Students:** Students in disciplines such as biology, chemistry, physics, psychology, economics, or social sciences can opt for this course to enhance their research skills. Python offers powerful libraries for data analysis, modelling, and visualisation, which can greatly facilitate their data-driven research.
4. **Business and Management Students:** Students studying business administration, management, or entrepreneurship can benefit from this course by acquiring Python programming skills for data analysis, business intelligence, and automation of business processes. Python is widely used in the business and management domain for its versatility and data-handling capabilities.
5. **Arts and Humanities Students:** Students in arts, humanities, or liberal arts disciplines can opt for this course to enhance their creative and critical thinking skills. Python can be utilized in digital arts, media analysis, text processing, and creative coding, enabling students to explore the intersection of technology and the arts.
6. **Health and Medical Students:** Students pursuing degrees in health sciences, medicine, or related fields can benefit from this course to understand how Python can be used in health data analysis, medical research, and healthcare system optimization. Python's libraries and tools support data processing, machine learning, and visualization in the medical domain.
7. **Education Students:** Students studying education or instructional design can opt for this course to gain programming skills that can enhance their teaching and instructional materials development. Python can be used to create interactive learning resources, educational games, and simulations.
8. **Any Individual Interested in Programming:** Students from any discipline with an interest in programming and a desire to learn Python can opt for this course. Python is known for its simplicity and readability, making it an excellent choice for beginners in programming.

**Overall, this course welcomes students from all disciplines who want to harness the power of Python programming and leverage it in their academic pursuits, research projects, or future careers.**

## Semester 1

### Theory: 1 credit, Practical 2 credits( 3 credit course)

Title of the course : **Python Mastery: SuperSkills Elite Level 1**  
 Duration : **6 months (online)**  
 Broad Area/Sector : **Programming**  
 Sub Sector : **Coding**  
 Name of Proposed Skill Partner : **AnsrCoach Eduventures Pvt. Ltd.**  
 Pre requisite of candidate : **Pursuing Graduation in any Discipline**  
 Job Prospects : **Python Developer,Data Scientist,Data Analyst, Machine Learning Engineer, Software Engineer,Web Developer,Backend Developer, Full-Stack Developer, DevOps Engineer, Automation Engineer, AI Engineer, Research Scientist, Game Developer, Natural Language Processing (NLP) Engineer, System Administrator**

Unit	Topic	General/Skill Development	Theory/Practical/ Training/Internship	Number of theory Hours	Number of Skill Hours
Unit 1	<b>Introduction to Python Programming</b> <ul style="list-style-type: none"> <li>• Introduction to Python and its features</li> <li>• Setting up the Python Development Environment</li> </ul>	General	Theory	6	
	<ul style="list-style-type: none"> <li>• Basic Python syntax and data types</li> <li>• Variables, operators, and expressions in Python</li> <li>• Writing programs to solve basic and intermediate problems</li> </ul>	Skill Development	Practical		15
Unit 2	<b>Control Flow and Decision Making</b> <ul style="list-style-type: none"> <li>• Conditional statements (if, else if, else)</li> <li>• Looping constructs (for and while loops)</li> </ul>	General	Theory	5	
	<ul style="list-style-type: none"> <li>• Break, continue, and</li> </ul>	Skill	Practical		20

	pass statements <ul style="list-style-type: none"> <li>• Exception handling with try and except</li> <li>• Implementing control flow in programs to solve real-world scenarios.</li> </ul>	Development			
Unit 3	<b>Data Structures in Python</b> <ul style="list-style-type: none"> <li>• Lists, tuples, and dictionaries</li> <li>• Working with sets and frozen sets.</li> </ul>	General	Theory	4	
	<ul style="list-style-type: none"> <li>• Understanding strings and string manipulation</li> <li>• Exploring file handling and input/output operations</li> <li>• Implementing data structures to solve complex problems</li> </ul>	Skill Development	Practical		25

**By the end of this semester you will have -**

- Basic understanding of Python programming language
- Ability to write Python code using correct syntax
- Knowledge of data types and variables in Python
- Familiarity with control flow structures (if statements, loops)
- Basic error handling using try-except blocks
- Understanding of basic data structures (lists, tuples, dictionaries)
- Proficiency in basic string manipulation and file handling in Python

**Certificate:** Certificate of Course Completion: Python Level 1

## Semester 2

### Theory: 1 credit, Practical 2 credits( 3 credit course)

Title of the course : **Python Mastery: SuperSkills Elite Level 2**  
Duration : **6 months (online)**  
Broad Area/Sector : **Programming**  
Sub Sector : **Coding**  
Name of Proposed Skill Partner : **AnsrCoach Eduventures Pvt. Ltd.**  
Pre-requisite of the candidate : **Pursuing Graduation in any Discipline**  
**Job Prospects** : **Python Developer,Data Scientist,Data Analyst, Machine Learning Engineer, Software Engineer,Web Developer,Backend Developer, Full-Stack Developer, DevOps Engineer, Automation Engineer, AI Engineer, Research Scientist, Game Developer, Natural Language Processing (NLP) Engineer, System Administrator**

Unit	Topic	General/Skill Development	Theory/Practical/ Training/Internship	Number of theory Hours	Number of Skill Hours
Unit 1	<b>Functions and Modules</b> <ul style="list-style-type: none"><li>Defining and calling functions</li><li>Function arguments and return values</li></ul>	General	Theory	5	
	<ul style="list-style-type: none"><li>Scope and variable visibility</li><li>Introduction to modules and importing modules in Python</li><li>Developing modular programs using functions and reusable modules</li></ul>	Skill Development	Practical		20
Unit 2	<b>Object-Oriented Programming (OOP) in Python</b> <ul style="list-style-type: none"><li>Fundamentals of OOP (classes, objects, attributes, and methods)</li><li>Encapsulation, inheritance, and polymorphism</li></ul>	General	Theory	6	
	<ul style="list-style-type: none"><li>Working with modules and packages in an OOP context</li><li>Understanding the concept of inheritance and method overriding</li><li>Implementing OOP</li></ul>	Skill Development	Practical		20

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	principles to design and develop applications				
Unit 3	<b>File Handling and Data Processing</b> <ul style="list-style-type: none"> <li>• Reading from and writing to files</li> <li>• Processing structured data (CSV, JSON, XML)</li> </ul>	General	Theory	4	
	<ul style="list-style-type: none"> <li>• Working with databases using Python</li> <li>• Manipulating and analysing data with Python libraries (NumPy, Pandas)</li> <li>• Building data processing pipelines for real-world datasets</li> </ul>	Skill Development	Practical		20

**By the end of this semester you will have-**

- Proficiency in defining and calling functions in Python
- Understanding of function arguments and return values
- Knowledge of scope and variable visibility in Python
- Ability to work with modules and import them in Python programs
- Understanding of object-oriented programming (classes, objects, methods, attributes)
- Familiarity with encapsulation, inheritance, and polymorphism concepts
- Ability to read from and write to files using Python
- Proficiency in manipulating and analysing data using Python libraries (NumPy, Pandas)

**Certificate of Course Completion: Python Level 2**

## Semester 3

### Theory: 1 credit, Practical 2 credits( 3 credit course)

Title of the course : **Python Mastery: SuperSkills Elite Level 3**  
Duration : **6 months (online)**  
Broad Area/Sector : **Programming**  
Sub Sector : **Coding**  
Name of Proposed Skill Partner : **AnsrCoach Eduventures Pvt. Ltd.**  
Pre-requisite of the candidate : **Pursuing Graduation in any Discipline**  
**Job Prospects** : **Python Developer,Data Scientist,Data Analyst, Machine Learning Engineer, Software Engineer,Web Developer,Backend Developer, Full-Stack Developer, DevOps Engineer, Automation Engineer, AI Engineer, Research Scientist, Game Developer, Natural Language Processing (NLP) Engineer, System Administrator**

Unit	Topic	General/Skill Development	Theory/Practical/ Training/Internship	Number of theory Hours	Number of Skill Hours
Unit 1	<b>Web Development with Python</b> <ul style="list-style-type: none"><li>• Introduction to web development frameworks (e.g., Django, Flask)</li><li>• Building web applications using Python</li></ul>	General	Theory	8	
	<ul style="list-style-type: none"><li>• Handling HTTP requests and responses</li><li>• Basic database integration for web applications</li><li>• Developing dynamic web applications using Python frameworks</li></ul>	Skill Development	Practical		35
Unit 2	<b>Data Visualization and Analysis</b> <ul style="list-style-type: none"><li>• Introduction to data visualization libraries (Matplotlib, Seaborn)</li><li>• Plotting and customizing charts and graphs</li></ul>	General	Theory	7	
	<ul style="list-style-type: none"><li>• Exploratory data analysis using Python</li><li>• Presenting insights and findings with visualizations</li></ul>	Skill Development	Practical		25

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	<ul style="list-style-type: none"><li>• Creating interactive and visually appealing data visualizations</li></ul>				
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**By the end of this semester you will have-**

- Ability to build web applications using Python frameworks (e.g., Django, Flask)
- Understanding of handling HTTP requests and responses in web applications
- Basic integration of databases into web applications using Python
- Proficiency in data visualization using Python libraries (Matplotlib, Seaborn)
- Skills in exploring and analyzing data using Python for insights and decision-making
- Knowledge of basic artificial intelligence (AI) and machine learning (ML) concepts
- Ability to implement ML algorithms in Python using popular libraries (Scikit-Learn, TensorFlow)
- Proficiency in building and training ML models for various tasks

**Certificate of Course Completion: Python Level 3**



## Semester 4

### Theory: 1 credit, Practical 2 credits( 3 credit course)

Title of the course : **Python Mastery: SuperSkills Elite Level 4**  
Duration : **6 months (online)**  
Broad Area/Sector : **Programming**  
Sub Sector : **Coding**  
Name of Proposed Skill Partner : **AnsrCoach Eduventures Pvt. Ltd.**  
Pre-requisite of the candidate : **Pursuing Graduation in any Discipline**  
**Job Prospects** : **Python Developer,Data Scientist,Data Analyst,  
Machine Learning Engineer, Software Engineer,Web Developer,Backend Developer, Full-Stack  
Developer, DevOps Engineer, Automation Engineer, AI Engineer, Research Scientist, Game  
Developer, Natural Language Processing (NLP) Engineer, System Administrator**

Unit	Topic	General/Skill Development	Theory/Practical/ Training/Internship	Number of theory Hours	Number of Skill Hours
Unit 1	<b>Introduction to Artificial Intelligence and Machine Learning</b> <ul style="list-style-type: none"><li>• Overview of AI and ML concepts</li><li>• Introduction to popular ML libraries (Scikit-Learn, TensorFlow)</li></ul>	General	Theory	15	
	<ul style="list-style-type: none"><li>• Implementing ML algorithms in Python</li><li>• Building and training ML models for various tasks</li><li>• Developing end-to-end AI/ML applications using Python</li></ul>	Skill Development	Practical		60

**By the end of this semester you will have-**

- Ability to apply Python skills to develop real-world projects
- Collaborative project work and teamwork skills
- Understanding of deploying and packaging Python applications
- Proficiency in presenting and showcasing individual or group projects
- Skills in building and maintaining a professional online presence
- Knowledge of data visualization and storytelling using Python
- Understanding of the basics of AI and ML applications
- Ability to leverage Python for AI and ML tasks such as data preprocessing, model building, and evaluation

**Diploma Certificate in Python.**



## Course Outcome

The outcome of this course is that you will have a strong foundation in Python programming, enabling you to:

1. Write Python code with correct syntax and effectively use data types, variables, and control flow structures.
2. Understand and implement object-oriented programming concepts like classes, objects, and inheritance.
3. Work with various data structures, including lists, tuples, dictionaries, and sets, for data manipulation.
4. Utilize Python libraries like NumPy and Pandas for data analysis and manipulation tasks.
5. Develop web applications using Python frameworks like Django or Flask, handling HTTP requests and integrating databases.
6. Create data visualizations and present insights using Python libraries such as Matplotlib and Seaborn.
7. Apply basic AI and ML concepts, implementing machine learning algorithms with Scikit-Learn and TensorFlow.
8. Collaborate on real-world projects, showcasing their Python skills and problem-solving abilities.
9. Deploy and package Python applications, including web applications and machine learning models.
10. Build a professional online presence and effectively present their work and projects.

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