Program Description Document Template

Course Name	**Certified Professional in Advanced Programming**	
Course Name as on Certificate	**Certified Professional in Advanced Programming**	
Certificate Type	Certificate of Completion by IITM Pravartak	
Certificate Issued by	IITM Pravartak	
Course Objectives	1) To make the learner understand Advanced concepts of Python programming and sharpen their algorithmic thinking 2) Learn Python programming till the advanced level of File handling, Read Excel Data using Python 3) Use Database such as MongoDB and perform complex data operations on it using Python programming 4) Learn Advanced Data Structure and Algorithms, will apply it in real time problem statements 5) Build a real time project using Python, MongoDB applying relevant Data Structure	
Eligibility	• For Indian Participants – Students / Graduates or Diploma Holders (10+2+3) from a recognized university (UGC/AICTE/DEC/AIU/State Government) in any discipline. • For International Participants - Students / Graduation or equivalent degree from any recognized University or Institution in their respective country.	
Pre-Requisites	Should know basics of programming and should have worked on Mini projects	
Target Segment	– Students / Graduates or Diploma Holders from a recognized university (UGC/AICTE/DEC/AIU/State Government) in any discipline. – Working Professionals who want to learn advanced programming and get a job in IT.	
Course Content	**See Enclosed Progamme details – as Annexure 1**	
Pedagogy	84Hrs of Online Teaching and Mentoring Support along with Online course content	
Assessment	Online, at the mid of the session and at the end.	
Programme Faculty	Industry Professionals who have vast expertise in Programming	
Duration	Weeks: 10 Hours: 84	
Class Schedule	Saturday and Sunday / 4.5 hrs. per day	
Programme Highlights/USPs	• **Covers till Advanced concepts in Programming** • **Real time project implementation** • **Online Course content is also available in English/ Tamil/ Hindi**	
Total Fees		**Total Fees (Rs.)**
	Total Programme Fee	Rs. 35,046/- (Inclusive of GST)

ANNEXURE 1

Proposed Course outline / programme / plan - Week wise or module wise syllabus details.

Programming – Advanced Course

Learn Python like a Professional! Go all the way to creating your own applications

'Python Programming' – course content:

Week 1 Module - 3 Hrs. Theory & 6 Hrs. Lab

- Functions as arguments
- List, Tuple and Dictionaries
- List Comprehension
- Assignment 4
- File handling
- Debugging elements breakpoints watch and step-in
- Debugging step in step out
- Assignment 5
- Debugging watch variables
- Class and Objects
- Final Quiz
- Assignment 6

Week 2 Module –- 3 Hrs. Theory & 6 Hrs. Lab

- Lambda, Filter and Map
- Python pip
- Read Excel Data in Python
- Python MySQL
- Assignment 7
- Iterators
- Pickling
- Python - JSON
- Python Mini Project

Data Structures & Algorithm - course content:

Week 3 Module – 3 Hrs. Theory & 6 Hrs. Lab

- Operating Systems Internals
- Networking Layers
- SQL
- JSON
- Quiz Assessment 5
- API
- Searching & Sorting
- Quiz Assessment 6

Week 4 Module – 3 Hrs. Theory & 6 Hrs. Lab

- Data Structures and Algorithms
- Abstract Data Type
- Data Structures - Stack, Queues
- Array, Linked List, DLL
- Hashing
- Clean Code
- Quiz Assessment 7
- Trees, Graphs
- Final Quiz Assessment

Week 5 Module - 3 Hrs. Theory & 6 Hrs. Lab

- Bit Manipulation
- Recursion
- Big O for Python Data Structures
- Big-O Functions - Constant, Linear, Quadratic
- Worst Case vs Best Case
- Stacks - Code Examples

- Queue & Deque - Code examples
- Linked Lists - Singly Linked List & Doubly Linked List

Week 6 Module - 3 Hrs. Theory & 6 Hrs. Lab

- Trees:
    - Tree Visual & Operations
    - Binary Search Trees
    - Tree Level Order Print
    - Graphs
        - Searching and Sorting
    - Hash Tables Hashing Functions- Separate Chaining & Linear Probing
    - Implementation of a Hash Table
    - Implementation of Sequential Search
    - Implementation of Binary Search
    - Implementation of Bubble Sort
    - Implementation of Insertion Sort
    - Implementation of Merge Sort
    - Implementation of Quick Sort
    - Binary Heap Implementation

Mongo DB – Course content:

Week 7 Module - 2 Hrs. Theory & 4 Hrs. Lab

- Delete Document
- MongoDB Projection
- Sort, Skip and Limit
- Final Quiz

Week 8 Module - 2 Hrs. Theory & 4 Hrs. Lab

- Indexing
- MongoDB Aggregation
- MongoDB Backup and Restore data
- Final Quiz

Week 9 & 10 Module: - 6 Hrs. Theory & 12 Hrs. Lab

Final Project, with Industry experts' mentorship (All lab programs happen in www.guvi.in)

- Each Students will do 1 project (Each project should be done in 2 weeks sprint)