

SR. AI ENGINEERING BROCHURE

COURSE OVERVIEW

Step into the world of AI Engineering, where data meets intelligence. This field blends core disciplines like Artificial Intelligence, Machine Learning, and Data Science to build solutions that learn and adapt. From Deep Learning models and Convolutional Neural Networks (CNNs) for image recognition to Natural Language Processing (NLP) and Transformers powering today's Large Language Models (LLMs), the possibilities are endless.

You'll get hands-on with industry-leading AI tools and develop smart AI agents capable of reasoning, interacting, and automating tasks—pushing the boundaries of what's possible with technology.

COURSE CONTENTS

1. PYTHON CODING SKILLS
2. MACHINE LEARNING ALGORITHMS
3. DEEP LEARNING NEURAL NETWORKS
4. NATURAL LANGUAGE PROCESSING - NLP
5. LARGE LANGUAGE MODELS - LLM
6. LANGCHAIN
7. AI AGENTS IMPLEMENTATIONS
8. LANGGRAPH
9. TOOLS
10. WORKFLOW AUTOMATIONS
11. RAG (RETRIEVAL -AUGMENTED GENERATION)
12. AGENTIC AI IMPLEMENTATION (END TO END PROJECTS)
13. MODEL CONTEXT PROTOCOL (MCP) SERVERS
14. MODEL CONTEXT (CONTEXT MANAGEMENT + MCP)
15. AZURE DATA ENGINEERING

1. PYTHON CODING SKILLS

- Understanding the reason of Python's popularity
- Different IDE, Anaconda and Jupyter Notebook
- Basics of Python
- Conditional Statements – if, nested if
- Loops – for , while
- String, List, Tuple, Set, Dictionary
- Functions – Types of functions

2. MACHINE LEARNING ALGORITHMS

- Introduction to Machine Learning Algorithms
- EDA using Pandas libraries
- Regression Algorithms
- Classification Algorithms

3. DEEP LEARNING NEURAL NETWORKS

- Introduction to Deep Learning
- Convolutional Neural Networks
- Tensorflow and Keras Packages
- Different types of Activation functions
- Projects : Image Classification Using CNN

4. NATURAL LANGUAGE PROCESSING - NLP

- Overview of NLP
- Data Preprocessing
- NLTK Package
- NLP Model Development
- Projects : Twitter Sentiment Analysis

5. LARGE LANGUAGE MODELS

- Introduction to Large Language Models
- LLM Architectures
- Pre-training of LLMs
- Fine-tuning LLMs: Prompt tuning, Multi-task fine-tuning, Parameter efficient fine-tuning
- Evaluating LLMs: Benchmarks, evaluation frameworks
- An overview of all recent LLMs highlighting the differences and similarities

6. LANGCHAIN

- Introduction to Langchain and Open AI
- Key Components of Langchain – Models, Chains, PromptTemplates, Agents, Vector Databases, Memory Management
- Loading documents from multiple sources
- Various kinds of Text Splitters – Recursive Characters, HTML Header, Json, Character Text Splitters
- OpenAI Embeddings, Ollama Embeddings, HuggingFace Embeddings
- Vector Stores – FAISS, Pinecone , chroma DB
- Model Implementation using Langchain and OpenAI API keys
- Build a chain with LCEL (LangChain Expression Language) using Groq API

7. AI AGENTS IMPLEMENTATION

- Introduction to AI Agents
- Types of AI Agents (reactive, deliberative, hybrid)
- Multi-Agent Systems and Applications
- Building Chatbot with Message History using LangChain
- Working with Prompt Template and Message ChatHistory using LangChain

Other AI Tools:

- AutoGPT (Agent development)
- Fixie.ai (Development platform)
- Chipp.ai (Marketplace)

8. LANGGRAPH

- Introduction to Langchain
- Key Components of Langchain – Models, Chains, PromptTemplates, Agents, Vector Databases, Memory Management
- Langchain Pipeline
- Model Implementation using Langchain and OpenAI API keys
- Build a chain with LCEL (LangChain Expression Language)

9. LANGGRAPH

- Overview of LangGraph & Its Core Capabilities
- Setting up of an Environment
- Configuring OpenAI API keys, GROQ API keys, LangSmith API keys
- Core Building Blocks: Nodes, Edges & State Management
- LangGraph Components – Chain, Routers, Tools , ToolNode
- Designing Stateful, Long-Running Applications - implement memory, checkpoints, and async execution for robust AI applications.
- Creating Workflows or Simple Graph Using LangGraph – Building nodes and edges.
- Building simple Graph StateGraph and Graph Compiling.
- Building LLM powered Simple ChatBot using LangGraph
- Agents and ReAct Agent Architecture in LangGraph
- Debugging LangGraph Applications with LangSmith – LangGraph Studio
- Different workflows in LangGraph
- Human in The Loop in LangGraph

10. TOOLS

- Introduction to AI Tooling Ecosystem
- Tool Calling Basics (LLM → Tool Communication)
- Tool Design Principles & Best Practices
- Creating Custom Tools (Python, API-based, Function-based)
- Integrating External APIs (search, DB, file operations, etc.)
- Tools in LangChain
- Tools in LangGraph

10. WORKFLOW AUTOMATIONS

- LangGraph WorkFlows Overview
- Prompt Chaining and implementation using LangGraph
- Parallelization, Routing ,Orchestration Patterns (sequential, parallel, branching)
- Orchestrator Worker Implementation
- Evaluator - optimizer
- Human-in-the-loop Workflows using LangGraph
- Editing Human Feedback in workflow
- Monitoring, Logging & Observability

11. RAG (RETRIEVAL -AUGMENTED GENERATION)

- What is RAG & Why It Is Needed
- RAG Architecture Overview
- Types of RAG (Basic, Advanced, Modular, Agentic RAG)
- Embeddings & Vector Stores (FAISS, Chroma, Pinecone, Azure)
- Indexing, Chunking & Preprocessing
- Retrieval Strategies (Similarity, MMR, Filters)
- Query Transformation, Re-ranking & Boosting
- Context Compression & Summarization
- Building RAG Pipelines in LangChain
- RAG with LangGraph + Agents
- Evaluation of RAG (precision, recall, hallucination tests)
- Optimizing RAG (caching, metadata, chunking strategies)
- Corrective RAG Implementation
- Adaptive RAG Implementation

12. AGENTIC AI IMPLEMENTATION (End to End Projects)

- Setting up VS Code Editor or Pycharm or any editors , GitHub Repositories
- Project Structure Overview
- Implementing End to End Agentic AI Project using LangGraph
- Designing the Front End using Streamlit , Gradio
- using Graph Builder , implement LLM Module, Graph Builder Modules
- Building Node Implementations
- Complete integration of Pipelines with FrontEnd Applications
- Testing , Debugging Entire Application
- Real-world End-to-End Projects
 - o Customer Support Bot

13. MODEL CONTEXT PROTOCOL (MCP) SERVERS

- Introduction to MCP
- MCP Fundamentals, Architecture, Core Concepts
- Create an MCP Server using Gradio's built-in MCP support
- MCP with Claude Desktop
- Installation of Cursor IDE
- Working with Smithery AI
- Integrating MCP in Agentic Workflows
- Implementing MCP Servers (file, DB, API-based)
- Connect to the server using different client implementations:
 - o A HuggingFace.js-based client
 - o A SmolAgents - based client for Python
- Building MCP Servers with Tools and Clients using LangChain
- Deploy your MCP Server to Hugging Face Spaces
- Test and debug the complete system

14. MODEL CONTEXT (CONTEXT MANAGEMENT + MCP)

- Understanding LLM Context Window
- Prompt Engineering Essentials
- Memory Types (short-term, long-term, vector memory)
- Context Packing & Prioritization
- Standardizing Tools with MCP
- Security, Permissions & Governance in MCP
- Best Practices for Context Control

15. AZURE DATA ENGINEERING

- Introduction to Azure Data Services
- Azure Data Storage Options
- Data Ingestion and Integration with Azure Data Factory (ADF)
- ETL Processes in Azure
- Performing Data Engineering in Azure
- Machine Learning in Azure DataBricks

ENROLMENT LINK:

https://share-eu1.hsforms.com/2Z0QqyR_NRyqDdDx038yolQ2ejigc

TARGET JOBS:

DATA SCIENTIST, DATA ANALYST, DATA ENGINEER/ ML ENGINEER START FROM 40K

DURATION: 60 HOURS

SCHEDULE: 3 BATCHES

Weekend Batch - Sat and Sun 11 am - 3pm

Weekday Batch - Mon, Wed, Thur 6pm -8pm

Weekday Batch - Mon, Wed, Thur 11am -1pm

MODE OF TRAINING:

ONLINE (MS TEAMS)

BENEFITS :

- Recorded sessions: Every session will be recorded in Ms Teams so that you can review the class any time upto 3 months.
- Course material: Every session will be backed up by the course content in pdfs, docs and excel so that it will help for further learning and homework.

RECENT TESTIMONIAL FROM KARTHIKEYAN:

“I am a Data Scientist actively seeking placement opportunities in the UK. During my search, I discovered IT Talent Hub and utilized their services. Thanks to their assistance, I am now successfully placed in a reputable company. I am immensely grateful to the department faculty, Subash and Swapna, as well as Director Sree Ram, and the placement cell for their invaluable guidance throughout the process. My experience with IT Talent Hub and its placement procedure was truly exceptional. The placement cell exhibited thorough knowledge and provided support at every stage”

RECENT TESTIMONIAL FROM POOVALAZHI



TO KNOW MORE DETAILS AND FEE STRUCTURE

Contact us

 [+44 7352 449736\(WhatsApp\)](https://wa.me/447352449736)

 [ITTALENTHUB.CO.UK](https://www.ittalenthub.co.uk)

 [INFO@ITTALENTHUB.CO.UK](mailto:info@ittalenthub.co.uk)



SUITE 1, 3RD FLOOR, FOREST HOUSE, 16-20 CLEMENTS RD,
ILFORD, LONDON IG1 1BA



DISCOUNT:

Many discounts like Student, Alumni, Referral etc available.

General FAQ :

1. Duration of the course

60 Hours

2. Do you provide materials for the course?

YES. Running notes, Admin guides etc, teams recordings.

3. What is the course fee?

The fee for the total duration of the course, including tutor fees, course material is £999.

4. What courses do you offer for students?

AI Consultant/ AI Engineering

Automation testing using AI

AI/ML Ops

Sr. AI Engineering

5. Is the course refundable?

The course is non-refundable. However, if you are unable to attend the course due to unavoidable reasons, we can transfer your course to a new batch.

6. Payment Plan

o Yes, we have a special plan to pay in 3 instalments for students. The total fee of £999 which is payable in 3 instalments:

☐ £200 (Refundable) - Deposit to enrol in the course

☐ 50% of balance - After 2 weeks of the course

☐ Rest of the payment - After 6 weeks of the course

7. Can I do this course outside the UK?

o Yes, we have students from different countries who are doing the course.

8. What is the fee for students outside the UK?

o Depends upon the currency. Please contact us for more details via WhatsApp - +44 7352 449736

9. Is it a live session or recorded session?

o It's a live session which is recorded for future reference for the students.

10. What are the timings of the course?

o Weekdays: Mon/Wed/Thu - 11 AM - 1 PM (OR) 6 PM - 8 PM (6 hours per week)

o Weekends: Sat and Sun - 11 AM - 2 PM (6 hours per week)

11. What if I miss a session?

o You can always go through the recording of the class you missed. If you have any doubts, you can connect with the trainer.

12. Is the course interactive?

o Yes, it is a live class. During the class, the trainer will discuss some technical questions.

13. Who will be the trainer?

o Trainers are all 10-15+ years experienced professionals working in multinational companies, who will help you with their real-time experience.

14. What if I join in the middle of the course?

o Based on your profile, you can join in the middle of the course. Our trainer will take catch-up sessions to cover the topics that have been covered so far in the class.



15. What if I want to discontinue in the middle of the course?

o We don't encourage discontinuation. However, in an emergency, please contact us. We will put you in a different batch and discuss individual circumstances.

