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GRADUATE CERTIFICATE PROGRAM IN ARTIFICIAL INTELLIGENCE

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OUR SHINING STAR'S



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Nishi Tiwari
Data Analyst



Vivek Chauhan
Data Science Engineer



Amey Ghadge
AI Engineer



Vaishnavi Jambe
AI/ML Engineer



Pratiksha Patil
AI Engineer

ENROLL NOW

Address: Sai Durga Building, Baner Rd, behind Allen Career institute, beside Kaka Halwai, Sahyadri Farms, Lalit Estate, Baner, Pune, Maharashtra 411045



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SYLLABUS

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Python Basic to Advance

1. Python Basics

- What is Python?
- Python Features and Applications
- Python History and Versions
- Installation and Configuration (Environment Set-up)
- Python Variables

2. Python Data Types

- Numbers
- Lists (with slicing and comprehensions)
- Booleans
- Sets
- Tuples
- Dictionaries

3. Python Operators

- Arithmetic Operators
- Comparison Operators
- Assignment Operators
- Logical Operators
- Bitwise Operators
- Membership Operators
- Identity Operators

4. Python Control Flow

- Conditionals: if, else, elif, nested if
- Loops:
 - while, Nested while
 - for, Nested for
 - break, continue, pass

5. Python Functions

- Functions and Arguments
- Recursive Functions
- Anonymous Functions (lambda)
- Scope (global, local, nonlocal)
- Modules and Packages

6. Python Libraries for AI/ML

- NumPy (Array operations and linear algebra)
- Pandas (DataFrame manipulation and cleaning)
- Matplotlib and Seaborn (Data visualization basics)

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SQL and Database Management

- Introduction to DBMS/RDBMS
- SQL Basics (Queries, Clauses, Constraints)
- Joins and Subqueries
- Stored Procedures and Triggers
- Working with Databases in Python using MySQL Connector



Data Visualization

- Python Libraries:
- Matplotlib
- Seaborn
- Interactive Dashboards with Dash
- Power BI for advanced dashboarding



Data Preparation and Feature Engineering

- Handling Missing Data
- Feature Scaling and Normalization
- Encoding Categorical Data
- Feature Selection and Extraction
- Exploratory Data Analysis (EDA) using Pandas and Seaborn



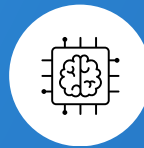
Machine Learning Basics

- What is Machine Learning?
- Types of ML: Supervised, Unsupervised, Reinforcement
- Applications of Machine Learning



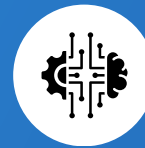
Supervised Learning

- Core Algorithms:
- Linear Regression
 - Logistic Regression
 - k-Nearest Neighbors (k-NN)
 - Decision Trees
 - Random Forests
 - Support Vector Machines (SVM)
- Model Evaluation:
- Accuracy, Precision, Recall, F1 Score



Unsupervised Learning

- Clustering: K-Means, Hierarchical
- Dimensionality Reduction: PCA
- Anomaly Detection
- Density-Based Clustering



Advanced ML Topics

- Hyperparameter Tuning (Grid Search, Random Search)
- Ensemble Techniques (AdaBoost, Gradient Boosting)
- Model Optimization (Regularization)

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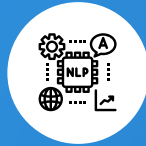
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Deep Learning

- Basics of Neural Networks
- Convolutional Neural Networks (CNNs)
- Recurrent Neural Networks (RNNs)
- Transformers and Attention Mechanisms
- Frameworks: TensorFlow, Keras
- Transfer Learning with Pre-trained Models
- Generative Adversarial Networks (GANs)
- Advanced Architectures: YOLO, UNet for Image Segmentation



Natural Language Processing (NLP)

- Text Preprocessing (Tokenization, Lemmatization, Stemming)
- Word Embeddings (Word2Vec, GloVe)
- Applications: Sentiment Analysis, Chatbots, Machine Translation
- Advanced Models: BERT, GPT



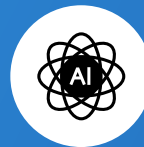
MLOps

- CI/CD for Machine Learning Pipelines
- Containerization with Docker
- Deployment with Flask and Django
- Model Monitoring and Drift Detection
- Workflow Automation with Apache Airflow
- Advanced MLOps with Kubeflow



Cloud Computing for AI

- Cloud Platforms: AWS, Azure, GCP
- Serverless Architecture for ML Deployments
- Model Hosting on Cloud
- Cost Optimization Strategies for Cloud



GenAI and RAG Architecture

- Building LLMs: Design, Fine-tuning, and Deployment
- Retrieval-Augmented Generation (RAG) for Conversational AI
- Ethical AI and Bias Mitigation

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Edge and Real Time AI

Edge AI

Introduction to Edge AI

- TensorFlow Lite for model compression
- Applications in IoT, Smart Cameras, Autonomous Vehicles

Real Time AI

- Streaming Data Processing (Kafka, Apache Flink)
- Real-time Predictions with Low Latency Models
- Scaling Models for Real-Time Use Cases



Big Data Integration

- Introduction to Hadoop and Spark
- Data Pipelines for Big Data (e.g., Kafka, Spark Streaming)
- Integration of Big Data with ML Workflows



Capstone Projects

- AI Chatbot using NLP
- Real-time Object Detection with CNNs
- Time Series Forecasting with ML
- End-to-End ML Pipeline with MLOps and Cloud Deployment
- Healthcare: Disease Prediction or Medical Imaging Analysis
- Finance: Fraud Detection or Stock Price Prediction
- E-commerce: Product Recommendations or Demand Forecasting

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CODENERA'S 360 DEGREE CAREER SUPPORT



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6 MONTHS DURATION

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WHAT YOU GET

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Notes:
