

# HARTRON Advanced Skill Centre Artificial Intelligence Certification Programme

A comprehensive, government-recognised certification programme designed to transform working professionals and recent graduates into skilled AI practitioners through industry-aligned training and hands-on experience.

# Organisation Overview

## Company Background and Credentials

HARTRON, the Haryana State Electronics Development Corporation Ltd., is a state government undertaking delivering IT and IT-enabled services, software development, and computer training across Haryana, India. As a nodal agency for computerisation and IT procurement, HARTRON operates an extensive network of authorised centres throughout the state.

HARTRON Advanced Skill Centre in Ballabgarh stands as an **industry-leading training provider** with exceptional credentials in business intelligence and analytics. Recognised amongst Haryana's fastest-growing technology companies, the centre has established itself as a premier destination for professional development in emerging technologies.



### Strategic Partnerships

HARTRON Advanced Skill Centre collaborates with private sector companies to deliver data analytics certifications, focusing on building India's digital skilling ecosystem. This alignment with national digital transformation initiatives positions the centre as a credible institution for technology career development.

### Government Recognition

Upon course completion, certification is issued by the Government of Haryana, providing official recognition valid for both government and private sector employment opportunities across India.

# Artificial Intelligence: A Complete Overview

This Artificial Intelligence certification programme is meticulously designed to help working professionals and recent graduates master the framework, intertwined concepts, utility tools, and best practices in AI. The elaborate curriculum combines instructor-led theory classes with integrated laboratories and capstone projects, ensuring comprehensive mastery of Artificial Intelligence.

"Most businesses today are looking at AI solutions to decrease expenditure on repetitive and menial tasks, whilst individuals utilise AI to accelerate their work and enhance creativity. What an extraordinary time to enter the field of Artificial Intelligence!"

## Why Pursue Artificial Intelligence?

600%

Market Growth

Projected expansion from  
2023-2028

73%

Job Satisfaction

Industry-leading satisfaction  
rates

45K+

Job Vacancies

Current openings across  
India

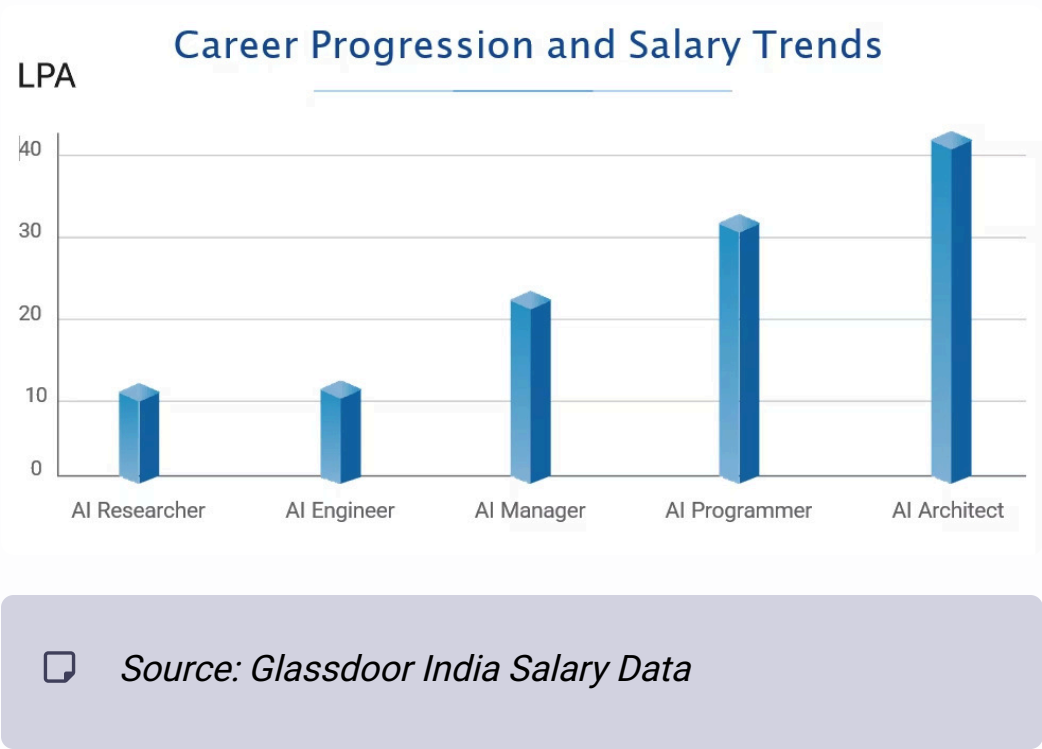
85%

Global Market Share

India's contribution  
worldwide

Source: Mordor Intelligence, TeamLease Digital, Glassdoor, People Matters, Naukri, LinkedIn's "The Global AI Talent Pool: 2022", NASSCOM's "India's AI Talent Landscape: 2022"

# Career Progression and Salary Trends



The artificial intelligence field offers exceptional career progression opportunities with competitive remuneration across various specialisations. From entry-level programming positions to senior research roles, professionals can expect substantial salary growth as they advance their expertise.

AI Researchers command the highest salaries, reflecting the specialised knowledge and innovation required in this role. Meanwhile, AI Architects and Managers occupy strategic positions that blend technical expertise with leadership responsibilities.

## Course Highlights



### 6 Months Duration

Comprehensive training programme designed to fit working professionals' schedules



### 50+ Hours Internship

Practical, hands-on experience with real-world projects and applications



### Capstone Projects

Industry-relevant projects demonstrating mastery of AI concepts and tools



### Assignments & Case Studies

Extensive practical exercises reinforcing theoretical knowledge



### 14+ Skills & 12+ Tools

Comprehensive coverage of essential AI technologies and methodologies



### 5 Value-Added Courses

Complementary training in Python, ChatGPT, Prompt Engineering, Generative AI, and MLOps

Our Artificial Intelligence course is a comprehensive programme that transitions learners from classroom theory to workplace readiness. Upon successful completion of training, internship, and assessments, you'll enter our exclusive placement pool with access to career opportunities across India's thriving AI sector.

## Skills Covered

- **Deep Learning**  
Neural networks, backpropagation, and advanced architectures
- **Natural Language Processing**  
Text analysis, sentiment analysis, and language understanding
- **Computer Vision**  
Image recognition, object detection, and visual processing
- **Machine Learning Algorithms**  
Supervised, unsupervised, and reinforcement learning techniques
- **Model Training & Optimisation**  
Hyperparameter tuning, regularisation, and performance enhancement
- **Model Evaluation & Validation**  
Metrics, cross-validation, and testing methodologies
- **Ensemble Methods**  
Bagging, boosting, and stacking techniques
- **Reinforcement Learning**  
Q-learning, policy gradients, and agent-based systems
- **Speech Recognition**  
Audio processing and voice-enabled applications
- **Statistics**  
Probability, distributions, and statistical inference

**Tools and Technologies:** ChatGPT, DALL-E 2, PyTorch, Python, Matplotlib, Scikit-learn, OpenCV, and additional industry-standard platforms

# Value-Added Courses

Our curriculum extends beyond core Artificial Intelligence concepts to include five essential value-added courses. These complementary programmes—Python, ChatGPT, Prompt Engineering, Generative AI, and MLOps Concepts—integrate seamlessly with the core AI curriculum and prove essential in today's AI landscape. This comprehensive skill set provides a competitive advantage during interviews and throughout your professional career.

## Python

Python serves as the primary programming language for Artificial Intelligence and Machine Learning. This value-added course helps you polish programming skills essential for becoming an AI Engineer. Master data structures, algorithms, libraries, and frameworks that form the foundation of AI development.

- Core programming fundamentals
- Data manipulation and analysis
- Object-oriented programming
- Integration with AI libraries

## ChatGPT

Understanding ChatGPT enables you to identify and mitigate bias in AI systems whilst developing ethical guidelines for AI programme development and deployment. This course explores large language models, their capabilities, and responsible implementation strategies.

- ChatGPT fundamentals and architecture
- Practical applications across industries
- Ethical AI considerations
- Bias detection and mitigation

## Prompt Engineering

One of the most crucial skills in AI is Prompt Engineering, enabling effective communication with and control of Large Language Models. This value-added course teaches you to craft well-structured prompts that generate high-quality outputs consistently.

- Prompt design principles
- Advanced prompting techniques
- Output optimisation strategies
- Context management and refinement

## MLOps Concepts

MLOps (Machine Learning Operations) bridges the gap between development and production of machine learning models. This course ensures you can deploy and maintain ML models effectively in production environments with proper monitoring and governance.

- ML deployment pipelines
- Model monitoring and versioning
- Infrastructure management
- Continuous integration for ML



# Curriculum: Artificial Intelligence

## Machine Learning and AI

### Introduction

- Machine Learning and AI fundamentals
- Types of learning: supervised, unsupervised, reinforcement
- AI landscape and ecosystem
- Industry applications and use cases



### Programming



#### Python Fundamentals

Basic programming concepts, data structures, control flow, and object-oriented programming principles



#### NLP Libraries

Spacy and Gensim for natural language processing tasks and text analysis



#### Computer Vision Tools

OpenCV, TensorFlow, and Keras for image processing and deep learning applications

### Mathematical Foundation

A solid mathematical foundation is essential for understanding and implementing AI algorithms effectively. Our curriculum covers four critical mathematical domains that underpin modern artificial intelligence.

#### Basic Statistics

- Descriptive statistics
- Sampling and sampling statistics
- Inferential statistics
- Hypothesis testing

#### Calculus

- Derivatives and differentiation
- Gradient calculations
- Optimisation techniques
- Applications in machine learning

#### Linear Algebra

- Functions and mappings
- Scalars, vectors, and matrices
- Vector operations
- Matrix transformations

#### Probability

- Probability spaces
- Probability distributions
- Conditional probability
- Bayesian inference

### Machine Learning & Ensemble Methods



#### Clustering Algorithms

K-Means and Hierarchical Clustering for unsupervised pattern recognition



#### Regression Models

Linear and Logistic Regression for predictive modelling and classification



#### Data Distribution

Train, test, and validation set strategies with gradient descent optimisation



#### Tree-Based Models

Decision Trees and K-Nearest Neighbours for classification tasks



#### Ensemble Techniques

Random Forest, Bagging, and Boosting for improved model performance

# Introduction to Neural Networks & Deep Learning

## Foundations

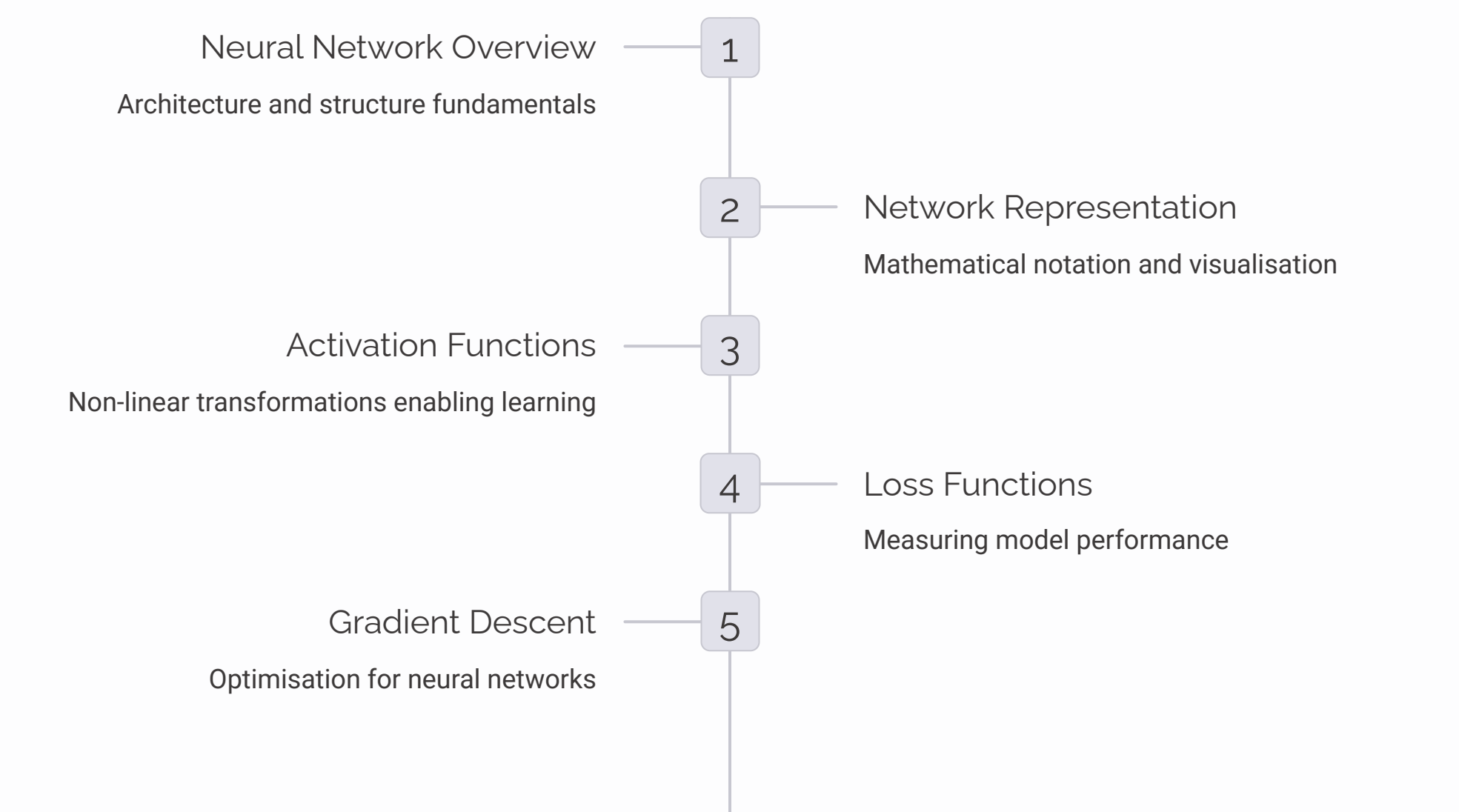
Deep learning represents a revolutionary approach to artificial intelligence, mimicking the human brain's neural networks. Understanding its strengths and limitations is crucial for effective implementation across diverse applications.

### Core Concepts

- Introduction to neural networks
- Deep learning importance and applications
- Strengths and limitations
- Single-layer and multi-layer perceptrons



## Feed Forward & Backward Propagation



## Parameters & Hyperparameters

Understanding the distinction between parameters and hyperparameters is essential for effective model development. Whilst parameters are learned during training, hyperparameters control the learning process itself.

**Dataset Management**

Strategic division of data into training, testing, and validation sets ensures robust model evaluation and prevents overfitting

**Gradient Challenges**

Addressing vanishing and exploding gradient problems through normalisation and careful architecture design

**Regularisation Techniques**

Implementing dropout and other regularisation methods to improve model generalisation

## Advanced Deep Learning Topics

**Speech Analytics**

**Speech Processing:** Automated Speech Recognition (ASR) systems and audio processing techniques

**Speech Synthesis:** Text-to-speech conversion, voice assistant devices, and building Alexa skills

**Reinforcement Learning**

**Core Concepts:** Introduction to RL, Q-learning, exploration vs exploitation strategies

**Applications:** Deep RL libraries, OpenAI Gym, policy gradient concepts, actor-critic methods, Proximal Policy Optimisation (PPO)

**RNN and LSTM**

**Forecasting:** ARIMA models and deep learning approaches including RNN, LSTM, and Transformer applications for time series prediction

## Natural Language Processing

### Basic NLP Concepts & Models

- Introduction to text mining
- Vector Space Models (VSM)
- Word embedding applications
- RNN, GRU, and LSTM architectures
- Introduction to Transformers
- Attention mechanisms (ELMo, BERT, T5)

### Text Mining & NLP Applications

- Word clouds and document similarity using cosine similarity
- Named Entity Recognition
- Machine translation using Hugging Face libraries
- Emotion mining
- Web scraping techniques

### Advanced NLP Models & Generative AI

**Transformers & Attention**

Single-head and multi-head attention mechanisms, pre-trained models including GPT, BERT, BART, and T5 with practical Python applications

**Encoder Models**

Transformer encoder variants: Basic BERT, RoBERTa, DistilBERT, and specialised architectures

**Decoder Models**

GPT family evolution: GPT, GPT-2, GPT variants, progress tracking, OpenAI API integration, and LLM playgrounds

**Sequence-to-Sequence Models**

BART and T5 architectures for translation, summarisation, and generation tasks

## Naive Bayes for NLP

Text classification using Naive Bayes approaches, comparing Frequentist versus Bayesian methodologies, and understanding prior, posterior distributions, and Bayesian estimators including posterior mean and median.

# Value-Added Course: Python

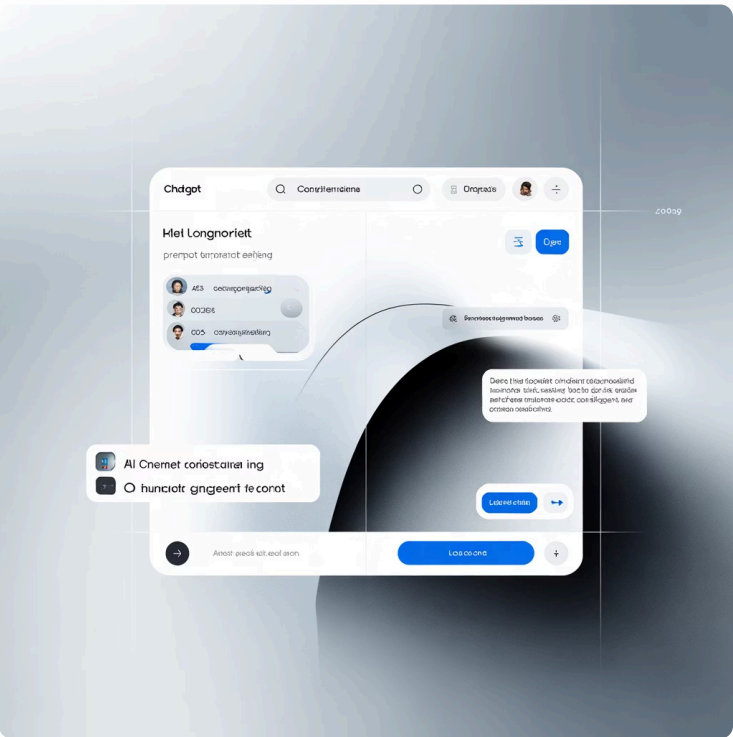
Python serves as the cornerstone of modern AI development. This comprehensive course covers everything from fundamental programming concepts to advanced frameworks, ensuring you possess the technical foundation necessary for AI implementation.



## Detailed Curriculum Components



## ChatGPT



### Introduction to ChatGPT and AI

- Understanding ChatGPT fundamentals
- Historical evolution of conversational AI
- Practical applications across industries
- ChatGPT versus other chatbot platforms
- Industry adoption and use cases
- Benefits and current limitations
- Future developments in language models
- Ethical considerations and responsible AI

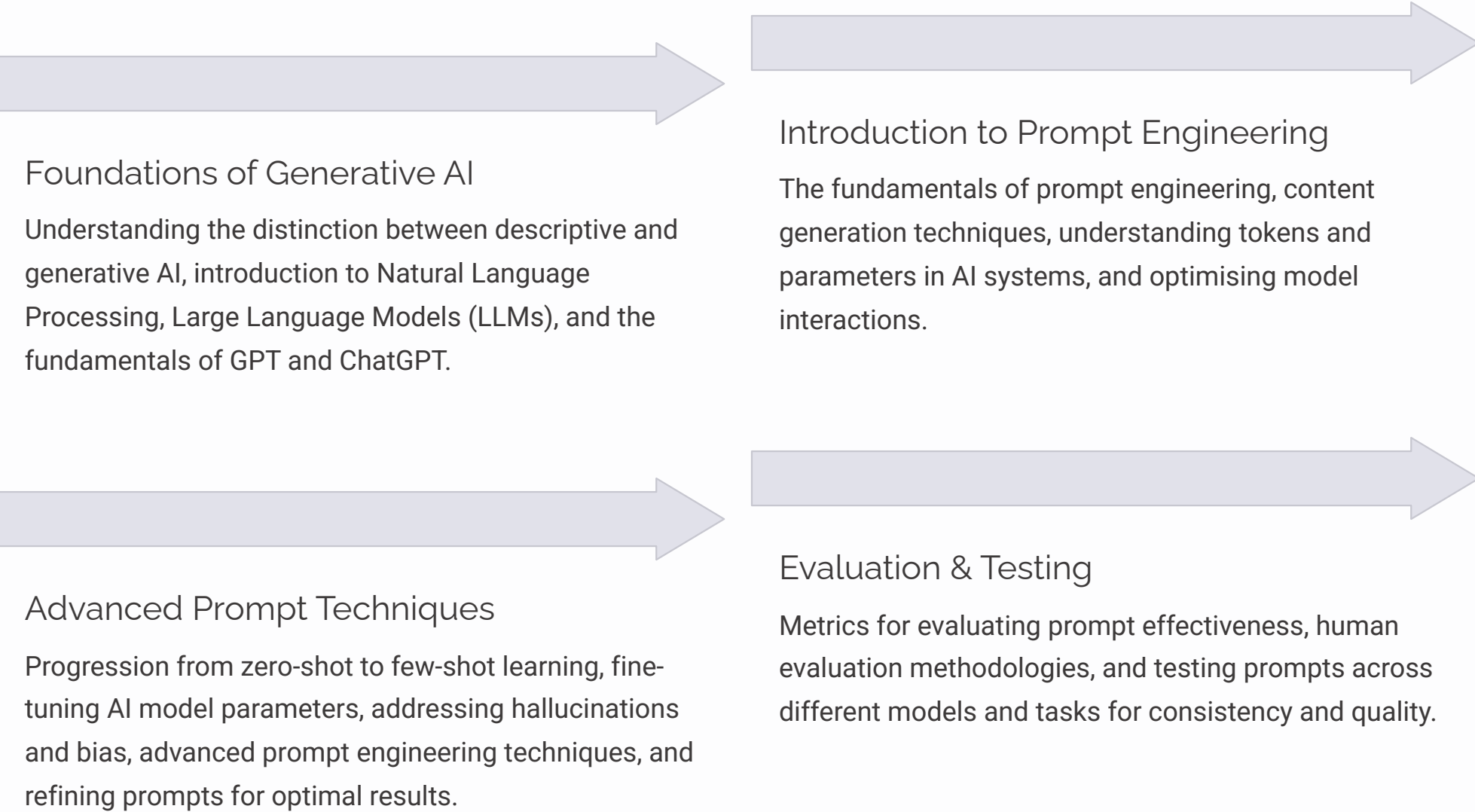
### ChatGPT Prompt Engineering

- Fundamentals of prompt engineering
- Types of prompts and their applications
- Crafting effective prompts for optimal outputs
- Using ChatGPT to generate meta-prompts



# Prompt Engineering & MLOps

## Prompt Engineering

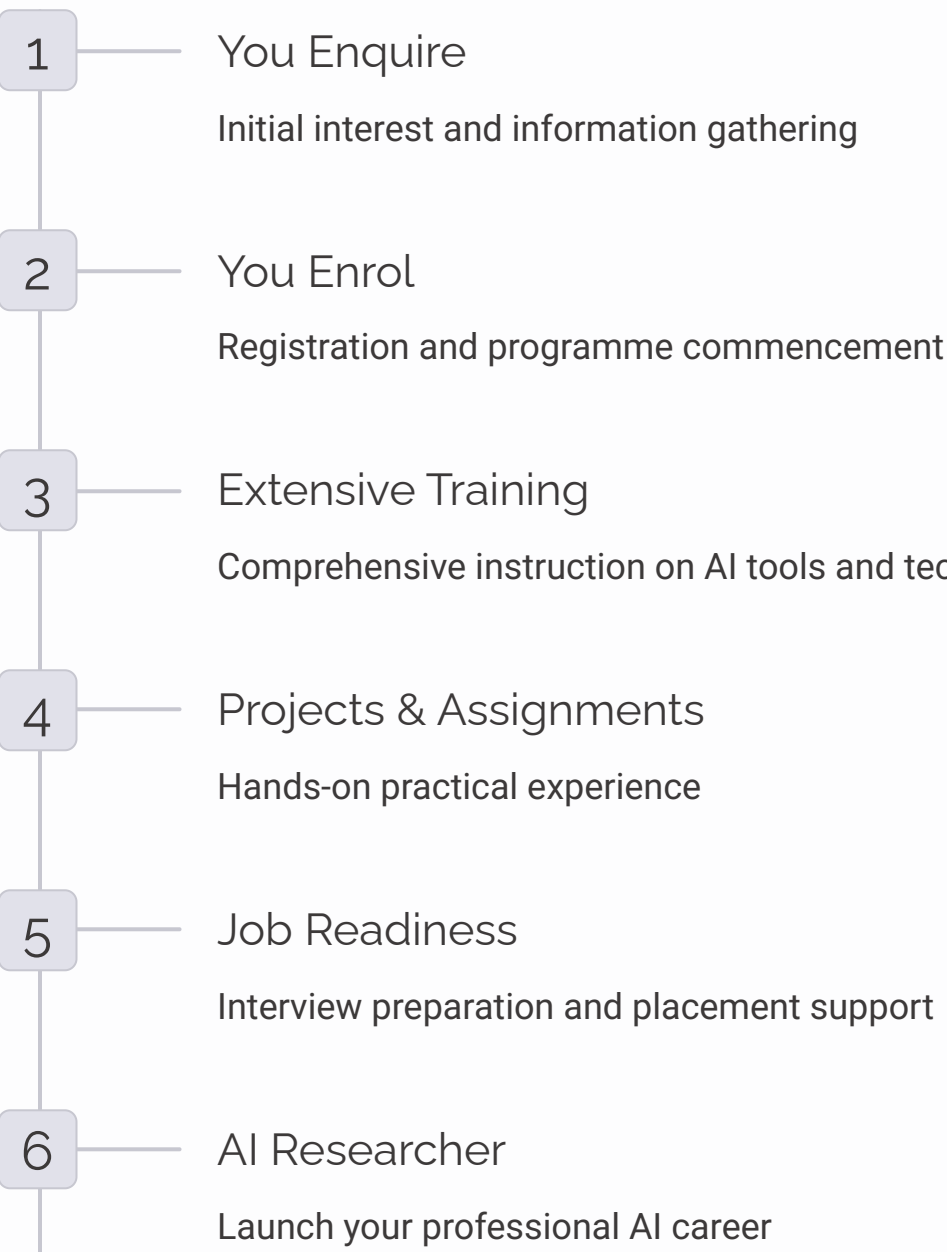


## MLOps (Machine Learning Operations)

MLOps bridges the critical gap between machine learning model development and production deployment. This comprehensive course ensures you can effectively manage the entire ML lifecycle, from initial design through deployment, monitoring, and continuous improvement.



## Learning Path



# Why HARTRON Advanced Skill Centre?

## Top-Notch Faculty

Our faculty represents our greatest strength. We employ certified Artificial Intelligence trainers with extensive experience and genuine passion for education. Trainers remain available throughout your learning journey to assist with queries and provide guidance.

## Jumbo Pass

Our complimentary Jumbo Pass grants access to one classroom batch plus unlimited live online batches for one year. Learn from different trainers to enhance concept absorption and assimilation through varied teaching approaches.

## Industry-Based Curriculum

Addressing unmet skill gaps in the technology sector, our course modules align with the latest technological trends and comprehensively cover essential topics, tools, and methodologies demanded by employers.

## Dedicated Post-Training Support

Learners gain invaluable hands-on experience through assignments and case studies. We provide dedicated mentors to address queries during this crucial practical phase, ensuring concept mastery and confidence building.

## Job Assistance Programme

Our commitment extends beyond theory and practice to career placement. Job readiness support is included in the course, featuring comprehensive placement assistance to transition you from training to employment.

## Job Readiness Programme

Our dedicated placement teams possess over a decade of experience transitioning students from classroom to workplace. This structured approach ensures you're fully prepared to succeed in AI career opportunities.



### Resume Preparation

Mentors guide you through creating a personalised resume that effectively connects your talents, skills, and experience



### LinkedIn Optimisation

Optimise your LinkedIn profile to attract recruiter attention and present your professional brand effectively



### Interview Preparation

Regular boot camps and preparation sessions build confidence and interview success strategies



### Mock Interviews

Industry expert panels conduct SWOT analyses with detailed feedback on performance and improvement areas

## Payment Options

We offer flexible, convenient payment options to facilitate your enrolment. Choose from multiple secure payment methods to begin your AI learning journey.

### UPI Payments

Quick and secure unified payments interface

### Net Banking

Direct bank transfers from all major Indian banks

### Debit / Credit Cards

All major credit and debit cards accepted



**Payment Terms:** One-time payment with immediate course access upon enrolment confirmation.