



masai®

Certification in Artificial Intelligence and Machine Learning

From Vishlesan i-Hub, IIT Patna

About IIT Patna, Vishlesan i-Hub

National Innovation Hub: Vishlesan i-Hub at IIT Patna is part of a national mission, advancing AI in speech, video, and text analytics for sectors like health, education and security.

Premier Technical Institute: IIT Patna is one of India's top engineering institutes, known for its cutting-edge research and strong academic foundation.

Strong Industry & Research Ecosystem: With active collaborations, incubators and innovation hubs, IIT Patna bridges academia and industry to drive real-world impact.

Program Overview

The foundations in Artificial Intelligence and Machine Learning Program is designed to accommodate learners from diverse academic and professional backgrounds. Through structured coursework and hands-on projects, students will build a solid understanding of Artificial Intelligence and Machine Learning techniques, starting from foundational mathematics and basic programming, progressing through core machine learning models and culminating in cutting-edge AI applications. By the end of the program, participants will be able to confidently implement AI/ML solutions, interpret results, and address real-world problems across various domains.



Why Choose This Course?

- **Prestigious Certification***: Receive a certificate of completion with Vishlesan i-Hub, IIT Patna, significantly enhancing your profile's value.
- **Real-World Capstone Project**: Work on capstone projects designed to solve practical business challenges.
- **Expert Faculty & Industry Insights**: Learn from IIT faculty & industry experts bringing real-world insights to your learning journey.
- **Placement Opportunities**: Receive resume reviews, career coaching, and placement support to land your dream role. (Eligibility: 7+ CGPA and 65% attendance)

**Certificate Eligibility: Min. 65% overall attendance & 30% marks in cumulative evaluations score*

What Will You Learn?

Begin your AI/ML journey with a beginner-friendly, industry-aligned curriculum from Vishlesan i-Hub, IIT Patna. Covering everything from Python basics to advanced topics like deep learning and generative AI, the program builds real-world skills through hands-on projects and expert-led learning.

Toolkit



Course Details

Course Duration
8 months

Weekly Commitment
10 hours per week

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Course Syllabus

Module 1: Foundations of AI and Data Science

- Master Python programming and professional version control work flows using Git and GitHub
- Build complex database queries using SQL to extract insight from relational systems
- Cleanse and reshape unreliable raw data into trusted analytical datasets using NumPy and Pandas
- Create persuasive visual narratives and statistical dashboards using Matplotlib and Seaborn
- Develop the probability and mathematical intuition underpinning every machine learning model

Module 2: Predictive Modelling & Machine Learning Systems

- Build regression and classification models that forecast genuine business outcomes
- Master model evaluation, selecting metrics aligned to real commercial cost
- Implement ensemble methods including Random Forests and Boosting
- Discover latent customer segments and detect anomalies without labelled training data
- Architect leak-free pipelines with cross-validation and systematic hyperparameter tuning

Module 3: Deep Learning, NLP & Emerging Trends

- Design and train neural networks from single neuron to deep architectures
- Deploy transfer learning to achieve production-grade image classification with minimal data
- Transform unstructured text into semantic embeddings for classification and sequence forecasting
- Master the attention mechanism and Transformer architecture powering every modern AI system
- Implement object detection with YOLO and image generation using GANs and Diffusion models

Module 4: Generative AI, LLM Engineering & Agentic Systems

- Decode LLM internals: tokenisation, attention and reinforcement learning from human feedback
- Implement advanced prompt engineering strategies producing reliable, structured enterprise output
- Architect Retrieval-Augmented Generation pipelines grounded in proprietary organisational knowledge
- Fine-tune foundation models efficiently using LoRA and parameter-efficient adaptation techniques
- Design autonomous AI agents that reason, select tools and execute multi-step tasks using LangChain

Module 5: Production Deployment, MLOps & Capstone

- Expose trained models as production-grade REST APIs consumable by any application.
- Deploy containerised AI services to the cloud with secure credentials and rollback management.
- Implement structured logging, monitoring and alerting across live inference systems.
- Mitigate production-specific AI failures: hallucination, model drift and runaway inference cost.
- Deliver portfolio-grade capstone projects that solve authentic industry problems end to end.

Projects

Product-Image Classifier (CNN)

Flipkart's catalogue team wants to auto-categorise product images into Apparel, Electronics, and Home. You train a small CNN on a public Indian e-commerce image dataset using free Colab GPU, push validation accuracy past 85%, and produce a confusion-matrix breakdown that names exactly which category pairs the model still fumbles and why.

Computer Vision • TensorFlow / PyTorch • CNN Architecture • Colab GPU • Confusion-Matrix Analysis

Decision Output

Trained classifier with documented confusion patterns the catalog team can route to manual review.

Customer-Churn Predictor & API

Build a churn-prediction model for a D2C customer dataset. Engineer RFM features (recency, frequency, monetary), train a gradient-boosting classifier, deploy as a FastAPI endpoint, and write the model card — including the ethical considerations around retention targeting that any real product team will probe in your interview.

XGBoost • RFM Feature Engineering • FastAPI Deployment • Model Card • Ethical Framing

Decision Output

A deployable churn predictor with a documented model card you can defend to a hiring panel.

Please Note: Due to the evolving nature of the industry expectations and partner institute feedback, some syllabus aspects may change. Any updates will be communicated during the inauguration session(s) or at the start of the relevant module.

The project deliverables or case studies for your batch may differ, as per the decision of the institute or course faculty

Meet our Instructor Team



Dr. Surya Prakash

Professor, Department of Computer Science & Engineering, IIT Indore

12+ Years | Biometrics | Deep Learning | Facial Recognition

Former Head of CSE at IIT Indore; researches biometric recognition systems using deep learning for security and authentication applications.



Nikhil Sanghi

Data Scientist, Synthesis Labs

Machine Learning | LLM Systems | Cloud AI

Builds LLM-powered systems and NLP platforms; Google Professional ML Engineer and TensorFlow Developer certified.



Amit Singh

Technical Trainer, Confidential Careers

Ex - Senior Software Engineer, Ericsson

Corporate Training | Instructional Design | Learning Systems

Corporate trainer delivering on-site and virtual programs using practical, industry-focused learning methodologies and instructional technologies.

Note: Instructors teaching your batch may change based on specific module expertise, or circumstances such as personal emergencies, unavailability, etc.

Admission Process

- **Submit Application**
Complete application form to showcase your motivation and goals
- **Complete Selection & Enrolment Session**
Only shortlisted candidates go through the counselling process
- **Start Learning**
Learn from India's top educators and stand out from the crowd

Fee structure

Application Fee Non-refundable	₹100
Registration Fee	₹4,000
Program Fee	₹50,000
Total Fee	₹54,000 + GST
Upfront Payment ₹59,720*	EMI via NBFC Partners ₹7,631/month × 9

**Inclusive of GST | Program fee is refundable as per our Refund & Withdrawal Policy*



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