



Vishlesan i-Hub
Indian Institute of Technology, Patna

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Learn in తెలుగు

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 (AI) and Machine Learning (ML) 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.
- **Mentorship & Community Support**: Get guidance from experienced mentors and join a growing community of learners in technology.
- **For Every Learner**: Whether you're a student, working professional, or job seeker, this program makes AI-ML accessible without needing advanced English proficiency.
- **Delivery in Telugu**: Learn directly from mentors who speak your language and can simplify complex ideas with local analogies and examples.

**Certificate Eligibility: Minimum 65% overall attendance and 30% marks in cumulative evaluations score*

What Will You Learn?

Begin your AI/ML journey with a beginner-friendly curriculum from i-Hub IIT Patna, taught in our language, Telugu. This course covers everything from Python basics to advanced, deep learning, and generative AI, while also learning tools like GitHub, GPT, NumPy, Pandas, and more. You also get to learn real-world skills through hands-on projects and expert-led learning.

Toolkit



& more

Course Summary

Course Duration
5 months

Weekly Commitment
4-5 Hours

Certification
From Vishlesan i-Hub, IIT Patna

Course Syllabus

Module 1: Foundations of Data

- AI vs ML vs GenAI landscape
- Git / GitHub / CLI
- VS Code / Colab
- Environments and secrets
- Python fundamentals (types, flow, functions, files) · Notebook discipline
- NumPy and pandas I (indexing, joins/merge, groupby, missing values)
- SQL (SELECT, WHERE, GROUP BY, JOIN) + Spreadsheets (pivots, XLOOKUP) · pandas ↔ SQL mental model
- Plotting and storytelling (matplotlib, plotly) · EDA checklist · Mini-project: Data Story
- APIs (requests, JSON) + Basic ethics · ingest → clean → EDA

Module 2: Classical ML

- ML workflow and habits: problem framing, train/validation/test split, baselines, cross-validation, metric tables
- Data preparation: missing values, duplicates, categorical encoding, scaling, leakage guard, simple feature engineering (dates, counts), class imbalance basics
- Regression: Linear Regression with regularization; metrics MAE, RMSE, R^2 ; quick error analysis
- Classification: Logistic Regression; Decision Trees and Random Forests; metrics accuracy, precision, recall, F1, ROC-AUC; threshold tuning
- Unsupervised learning: k-means clustering for segmentation; PCA for dimensionality reduction and 2D visualization
- Time series (lite): trend and seasonality, time-aware split and rolling evaluation

Module 3: GenAI and Agents

- LLM fundamentals: tokens, context windows, prompt engineering (role, few-shot, chain of thought), token handling
- Tool and function calling: structured outputs (JSON, validation)
- Multimodality (lite): speech-to-text → summary → text-to-speech pipeline
- RAG 101: embeddings, chunking, retrievers, vector stores; RAG evaluation (answer correctness, context recall), semantic search
- Open-source LLMs: working with Hugging Face, Ollama, and local LLMs; small local model demo
- Agent patterns: memory, control flow
- LangGraph (orchestrator) basics: nodes, transitions, retries
- Build project: small agent that plans → retrieves (RAG) → calls a tool → returns structured output
- Safety: prompt injection, tool abuse, guardrails
- Utilizing Cursor and Claude Code: improving efficiency without losing control (diff review, lint/tests, no silent edits)

Capstone Project

- Time Travel to Your Past: Using long-term memory, natural language querying, and vector databases, build a system that connects to your digital exhaust (emails, chats, tweets, documents) and constructs a lifelong timeline of your digital self.
- Digital Twin: Your AI Clone That Talks Like You, An AI trained on your communication style, values, and decisions that can represent you in meetings, talk on the phone on your behalf, reply to emails, or continue projects when you are away. It speaks like you, prioritizes like you, and learns continuously from your decisions — a step toward personal delegation through digital cloning.

Instructors



Aravind Samudrala
Software Engineer II, Google

Aravind is a skilled software engineer with experience in gRPC, microservices, Spring Boot, Java, full-stack development, and modern web frameworks like Redux.js. Prior to joining Google, he worked as a Software Engineer II at Blue Yonder in Hyderabad, where he focused on backend systems using Spring Boot and Java. He also held roles at BlackBuck (SDE I) with a focus on full-stack development and at NeoSOFT Technologies as a Software Engineer Intern specializing in JavaScript and blockchain technologies. Aravind's progressive career highlights his expertise in scalable backend engineering and collaborative development across different tech stacks.



Prasad Seema Kurthi
AI/ML | CTO, AI Star | ex-Amex, Grab | University of Virginia

Prasad leverages deep expertise in large language models (LLMs), data science, and machine learning to drive business value through AI-powered solutions. As Co-Founder and CTO at a stealth AI startup, he leads the design and implementation of advanced AI and big data systems, with a focus on conversational AI tailored for complex user requirements. Previously, he guided ML, knowledge graph, and data engineering teams at Compass, developing robust, scalable platforms using technologies like Databricks, Spark, and vector databases. Prasad excels in machine learning observability, scalable microservices, and delivering user-centric AI innovation.



Balaji Chippada

Senior Data Scientist, Warner Bros Discovery

Experienced Senior Data Scientist with 7 years in the IT industry, specializing in machine learning, deep learning, NLP, and generative AI. Proven track record of leading data-driven projects to achieve significant business outcomes, collaborating effectively with international teams, and deploying production-ready.

Admission Process



Clear Qualifier Test

Clear the qualifier test to be eligible for the program.



Complete Counselling

Only shortlisted candidates go through the counselling process.



Start Learning

Learn from India's top educators and stand out from the crowd.

Fees Structure

Qualifier Test Fee (Non-Refundable)	₹49	
	Option 1	Option 2
	Upfront	EMI (Through our NBFC partners)
Secure Seat Fee (Non-Refundable)	₹2,000	₹2,000
Programme Fee (Non-Refundable)	₹18,000	₹6,360 x 3 months
Total	₹20,000*	₹21,080*

*GST at 18% extra, as applicable

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