

## The Agentic AI Revolution is Here

2023: ChatGPT changes the conversation  
2024: Companies race to adopt AI  
2025: Winners deploy autonomous agent systems



The question isn't whether AI will transform your industry. It's whether you'll build the systems— or be replaced by them.

Executive Post Graduate Programme in

# Applied AI & Agentic AI



30 Weeks | LIVE + Labs

From ML Foundations to Autonomous Agent Systems



## About IIITB

### The International Institute of Information Technology Bangalore (IIITB)

Established in 1998, IIITB is a premier institute known for its interdisciplinary approach, integrating technology with social sciences. Supported by the Government of Karnataka and the IT industry, IIITB fosters strong academic-industry partnerships and attracts top talent from across India and abroad through its merit-based selection process.

The institute has graduated over 3,500 students, many of whom work at leading IT companies globally. With a focus on research and development in fields like Artificial Intelligence (AI) and Machine Learning (ML), IIITB is recognised as a leader in AI education.

Ranked 69<sup>th</sup> in the Engineering category of the National Institutional Ranking Framework (NIRF) in 2025, IIITB continues to excel in education and research, making it a preferred destination for aspiring technologists and future leaders.



**AICTE**



**UGC**

# ABOUT upGrad

“upGrad is a leading global learning and workforce development company. We’re on a single-minded mission of powering career success for every member of the global workforce as their trusted lifelong learning partner. Established in 2015, we have over 10 million learners who have upskilled in a range of online and offline programs from top universities in India and the world.”



**Ronnie Screwvalla**

Co-founder & Executive Chairman



# The Skills Gap

(And Your Opportunity)

## Companies Need

- ✓ Deploy LLMs in production
- ✓ Build autonomous agents
- ✓ Scale AI economically
- ✓ RAG with enterprise data
- ✓ Measure ROI, control costs

## Most Engineers Have

- ✗ Theoretical ML knowledge
- ✗ Isolated deep learning
- ✗ Notebooks that never deploy
- ✗ No production experience
- ✗ Academic projects only

### Market Reality

(2023–2025)

88%

of AI projects fail to reach production

**IDC Enterprise Survey**

Agentic AI roles command

**+30-40%**

**Salary premiums**

Typical time to build deployment skills

**18-24**

**Months**

**The Programme Advantage**



30 weeks to production

**Live systems with monitoring, ROI docs, and live URLs**





# Two Parts. One Transformation

## Part A: Applied AI

### Master Production ML

**Module 1 (W1-4)**  
Foundations & Data  
Python · SQL · Features

**Module 2 (W5-9)**  
ML & Deep Learning  
Models · CNNs · Transformers

**Module 3 (W10-14)**  
MLOps & Production  
AWS · Docker · Monitor

**Capstone A (W15)**  
End-to-End ML System  
Deploy + Monitor + ROI

- **Part A Outcome:**  
ML API in production with monitoring & cost controls

## Part B: Agentic AI

### Build Autonomous Systems

**Module 4 (W16-18)**  
LLM Foundations & RAG  
APIs · Embeddings · Vectors

**Module 5 (W19-23)**  
Agent Frameworks & orchestration · LangChain · LlamaIndex · LangGraph

**Module 6 (W24-28)**  
Fine-tuning & Scale LoRA · Bedrock · Security

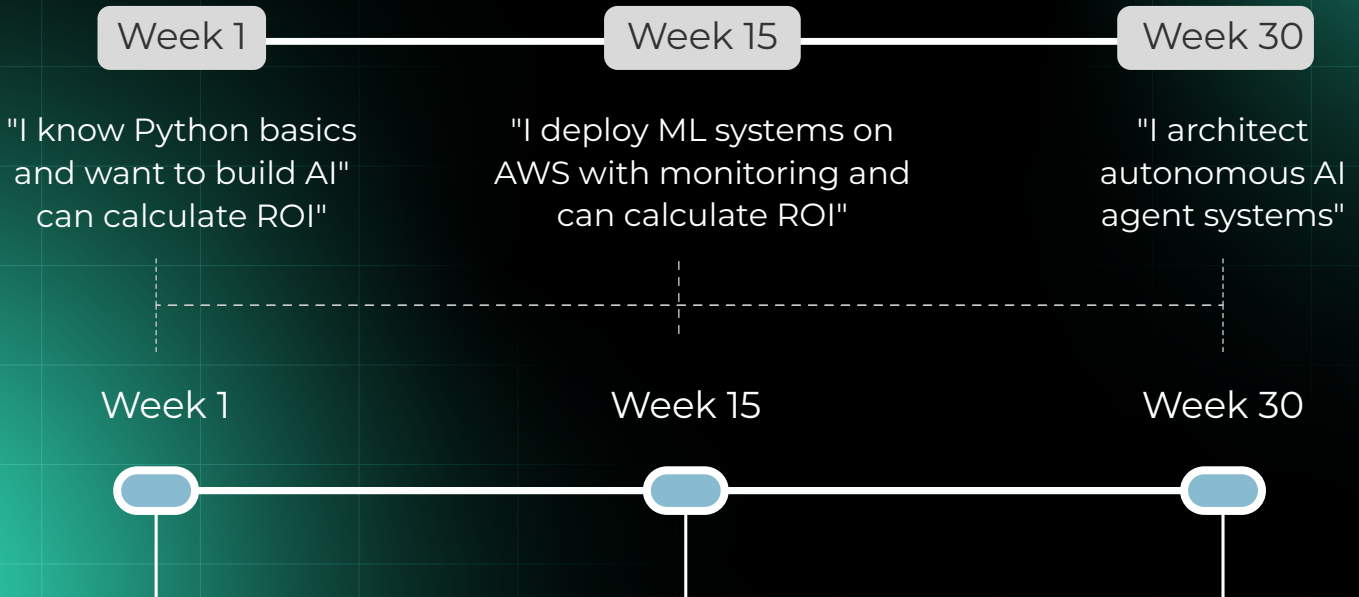
**Capstone B (W29-30)**  
Production Agent Platform  
Multi-Agent + RAG + Deploy

- **Part B Outcome:**  
Multi-agent RAG platform with security & ROI report

## Tools evolve

we teach orchestration patterns first (planning, memory, tool-use, safety), with hands-on in current leaders like LangChain, LlamaIndex, LangGraph.

# Your 30-Week Transformation



## Foundation

Foundations  
Python  
SQL  
Features

ML/DL  
Models  
CNNs  
Transformers

## Application

MLOps  
Docker  
FastAPI  
SageMaker

LLM/RAG  
Embeddings  
Vector DBs  
RAG

## Innovation

Agents  
Orchestration  
Multi-agent  
Guardrails

SCALE  
Deploy  
Secure  
Monitor

## Weekly Commitment



### Live classes

3h/week

90+ live hours across

30 weeks



### Labs/clinics

1-2h/week

Projects

3-4h/week



### Peer/case

1-2h/week

Support

1h/week

# Why This Programme Vs Everything Else

## Typical Programmes

- Theory-heavy ML
- 2020-era techniques
- Academic toy projects
- One capstone (maybe)
- Cloud mentioned, rarely used
- "Here's scikit-learn"
- LLMs as theory
- Cost ignored
- Generic certificate

## This Programme

- Applied + Agentic in one
- 2024–25 frontier: agents, RAG
- Production systems, live APIs
- Two capstones, two portfolios
- AWS hands-on every week
- "Here's deployment + monitoring"
- Orchestration in prod (patterns)
- Token economics + ROI built-in
- Deployed systems you can demo

## The Three Competitive Advantages

### Dual Architecture

- Applied AI (W1–15) + Agentic AI (W16–30) in one programme
- Build churn models AND autonomous agent crews
- Prove versatility hiring managers want

### Production-First

Every module ends with deployment  
W15: ML API on AWS with monitoring  
W30: Multi-agent platform in production  
Portfolio = Live URLs, not notebooks

### Agentic AI Depth

15 weeks on autonomous agents (most programmes: 0–2 weeks)  
LangChain · LangGraph · AutoGen · CrewAI  
Production patterns for 2025 job market (30–40% premium roles)

# What You'll Ship

**8+**

Projects

Pipeline » Agents  
Every Week Ships

**2**

Capstones

A: MI System (W15)  
B: Agent Platform (W30)

**90+**

Live Hours

Lectures + Labs +  
Clinics + Support

## Portfolio Assets



### Github Repos

Clean, Tested Code | CI/Cd Pipelines | Docs | Code Reviews



### Deployed Sys

ML Apis On Aws | Fes; Endpoints | Agent Platforms | Monito



### Business Docs

Roi Calculations | Model Cards | Architecture | Exec Deck

## Capstone

**A**

(Week 15)

### End-To-End ML System

#### Track

Predictive Maintenance OR Customer Intelligence OR Project form your domain

#### Deliver

Repo - Aws Deploy - Monitoring - Roi Brief - P,E,G,Tacg Deck

## Capstone

**B**

(Week 29-30)

### PRODUCTION AGENTIC AI

#### Track

Enterprise Assistant OR Autonomous Research OR Ops Crews OR  
Develop a custom AI agent for your field

#### Deliver

Architecture | Repo | Bedrock deploy | Monitoring | Cost report  
Security review | ROI | Defence presentation



## Detailed Curriculum

### Module 1: Foundations & Data Engineering

(Weeks 1-4)

Build production-ready data pipelines and SQL backends

#### Key Topics

Python OOP, Pandas advanced, SQL joins/CTEs/windows, Feature engineering, Scaling/encoding, Pipeline automation, EDA methodology, Matplotlib/Seaborn, Git/GitHub, Business communication, Stakeholder presentations

#### Sample projects

Weekly sales & margin pipeline | Cohort retention table | Feature engineering competition | SQL backend for revenue dashboard

#### Tools



### Module 2: Machine Learning & Deep Learning

(Weeks 5-9)

Train, interpret, and deploy ML/DL models for business impact

#### Key Topics

Linear/logistic regression, Trees/boosting (XGBoost/LightGBM), Model eval, SHAP/LIME interpretability, SVM/ensembles, Clustering/PCA/UMAP, Neural nets from scratch, Backpropagation, CNNs/transfer learning, RNNs/LSTMs, Transformers/attention, BERT/GPT, Time series (ARIMA/Prophet)

#### Sample projects

Churn model with SHAP report | Image classifier via transfer learning | NLP sentiment with transformers | Time series forecasting | Customer segmentation with clustering

#### Tools



### Module 3: Mlops & Production Systems

(Weeks 10-14)

Deploy ML with monitoring, cost control, and governance

#### Key Topics

AWS (S3/IAM/VPC/Glue/Athena/Redshift), SageMaker training/HPO, MLflow tracking, Docker containerization, FastAPI serving, A/B testing, Model drift detection, Monitoring dashboards, Fairness/bias, Governance/audit, ROI calculation, Stakeholder communication

#### Sample projects

Cloud data pipeline | Distributed training | Dockerized API | MLOps pipeline with monitoring | Executive ROI presentation

#### Tools



### Capstone A End-To-End ML System

(Weeks 15)

Prove your mastery with a real business solution

**Tracks:** • Predictive Maintenance • Customer Intelligence

#### Deliverables

GitHub repo | AWS deployment | Monitoring dashboard | Defense deck | ROI document | Security & cost checklists (must pass)

### Module 4: LLM Foundations & Rag Systems

(Weeks 16-18)

Build production RAG with governance and cost optimization

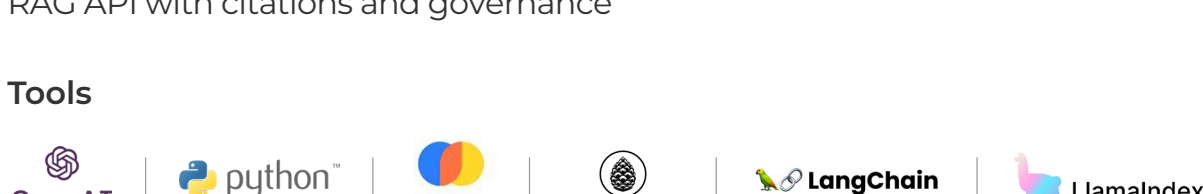
#### Key Topics

LLM architecture/scaling laws, OpenAI/Anthropic/Google APIs, Token economics/cost optimization, Prompt engineering (few-shot/ReAct), Embeddings/similarity, Vector DBs (Pinecone/Weaviate/Chroma), Hybrid search, Chunking strategies, RAG patterns, Query rewriting, Multi-hop reasoning, Citation/attribution, Retrieval governance, RAG evaluation

#### Sample projects

Prompt engineering challenge | RAG prototype with metrics | Production RAG API with citations and governance

#### Tools



### Module 5: Agent Frameworks & Orchestration

(Weeks 19-23)

Design multi-agent systems with planning and supervision

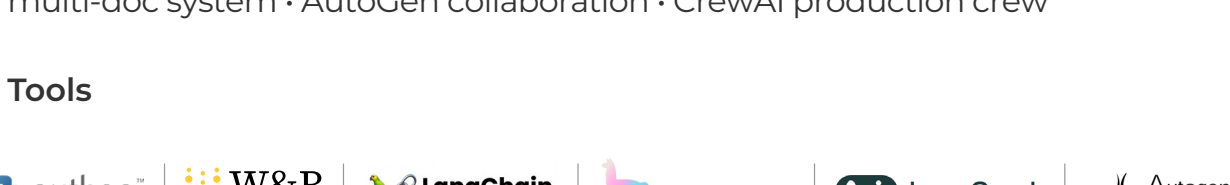
#### Key Topics

Agent types/capabilities, ReAct pattern, Tool use/function calling, Memory systems, Planning/goal decomposition, LangChain (chains/agents/tools/memory), LangGraph (state/routing/supervision), LlamaIndex (indices/routers/multi-doc), AutoGen (collaboration/consensus), CrewAI (production/delegation), Telemetry/observability, SLOs/error budgets

#### Sample projects

Agent architecture design • LangChain app with tools • LlamaIndex multi-doc system • AutoGen collaboration • CrewAI production crew

#### Tools



### Module 6: Fine-Tuning, Scale & Production

(Weeks 24-28)

Tune models, harden security, deploy at scale

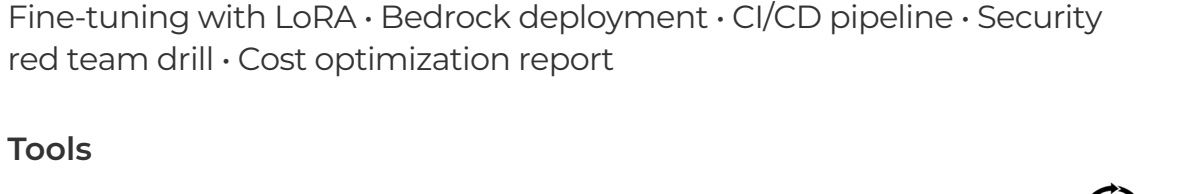
#### Key Topics

Fine-tuning strategies, LoRA/QLoRA/PEFT, Dataset prep/quality, Evaluation/benchmarking, AWS Bedrock/SageMaker, Ray Serve scaling, Load balancing, Caching/optimization, CI/CD (GitHub Actions), Blue-green/canary deploys, Prompt injection defense, Privacy/audit logging, IAM/security, Red team testing, EU AI Act compliance, Human-in-the-loop, Cost optimization

#### Sample projects

Fine-tuning with LoRA • Bedrock deployment • CI/CD pipeline • Security red team drill • Cost optimization report

#### Tools



### Capstone B Production Agentic AI System

(Weeks 29-30)

Prove your mastery with a real business solution

**Tracks:** • Enterprise Assistant • Autonomous Research • Business Operations

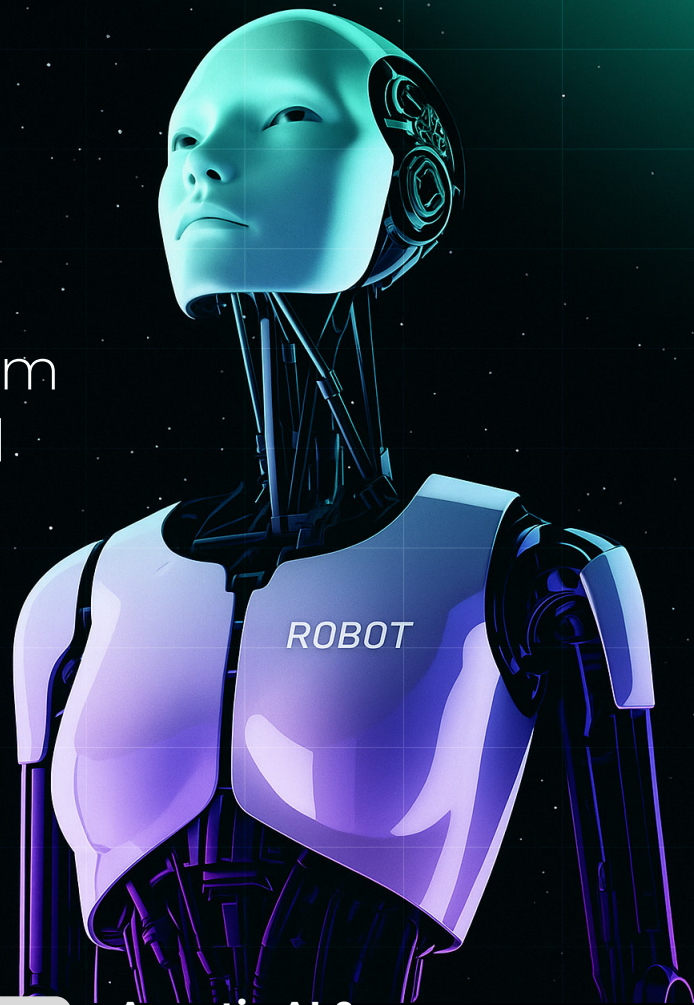
#### Deliverables

Architecture diagram | GitHub repo | AWS Bedrock deployment | RAG with governance | Monitoring dashboard | Cost report | Security review | Defense presentation | Security & cost checklists (must pass)



# The Complete AI Tool Stack

Master the industry's most in-demand tools from Python to LangChain and build systems that run in real-world production.



## Programming & Data Foundations

Tools and environments for data manipulation, coding, and visualization



## Machine Learning & Deep Learning

Core ML/DL frameworks and interpretability libraries



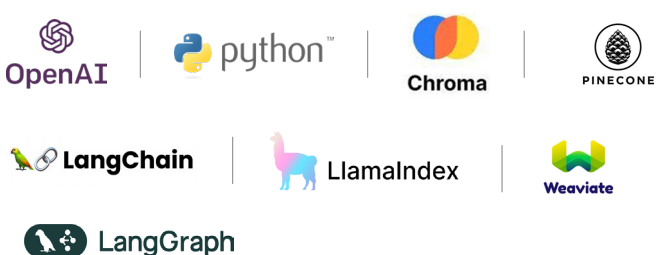
## Cloud, MLOps & Deployment

End-to-end deployment, monitoring, and automation tools



## LLMs, RAG & Vector Databases

Large Language Model tooling and RAG (Retrieval-Augmented Generation) stack



## Agentic AI & Orchestration Frameworks

Tools for multi-agent design, memory, planning, and supervision



## Security, Governance & Scaling

For enterprise-grade robustness, compliance, and optimization



- Privacy & Audit Logging, IAM Policies, Red Team Testing
- EU AI Act Compliance, Cost Optimization, Human-in-the-loop Systems



## Visualization, Reporting & Business Tools

Tools for business storytelling, dashboards, and ROI tracking



- ROI Documentation Templates, Executive Defense Decks



## Supporting Tools & Utilities

Essential for workflow, code quality, and collaboration



- Business Docs: Model Cards, Architecture Diagrams, ROI Reports



# Build Real-World AI Agents. Deploy Them Across Domains

Build industry-grade AI blueprints, from adaptive tutors to compliance bots, and showcase your skills with a portfolio of deployable agents



## Healthcare & Life Sciences

Autonomous Clinical Trial Recruitment Agent



## BFSI

AI Compliance Officer for Financial Reporting



## Retail & E-commerce

Hyper-Personalized Conversational Shopping Agent



## Manufacturing & Supply Chain

Autonomous Supply Chain Disruption Response Crew



## Media & Entertainment

AI-Powered Content Strategy & Generation Pipeline



## Education (EdTech)

Adaptive AI Tutor or Personalized Learning Paths



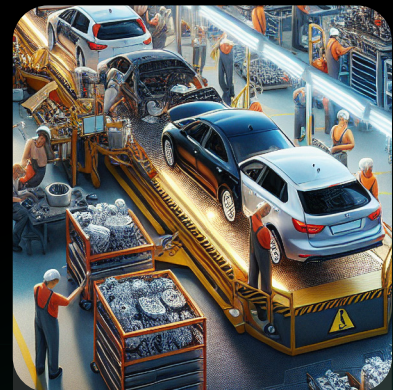
## Real Estate & PropTech

AI Agent for Property Valuation and Market Analysis



## Energy & Utilities

Predictive Grid Management Agent Crew



## Automotive

Autonomous Vehicle Sensor Data Analysis Crew



## LegalTech

AI Paralegal for e-Discovery and Case Law Research



## Agriculture (AgriTech)

AI-Powered Precision Farming Operations Agent



## Hospitality & Travel

Autonomous Travel Concierge and Itinerary Planner



# Two Capstones. Double the Impact.

From Model to Market — Deploy Twice, Learn Twice.



## Applied AI Capstone

- » **Theme**  
ML System in Production
- » **Goal**  
Deploy a machine learning system that solves a real business problem.
- » **Focus Areas**  
Data Pipelines  
MLOps & FastAPI  
Monitoring & ROI tracking
- » **Output**  
Deployed ML API + Dashboard



## Agentic AI Capstone

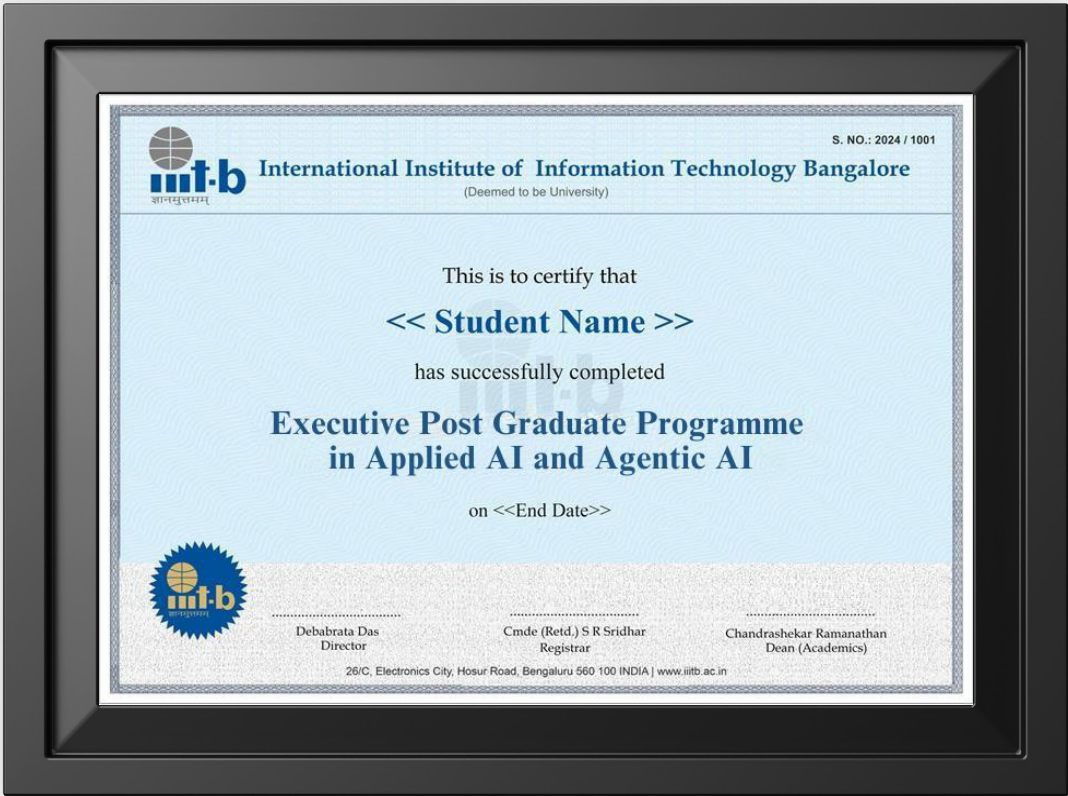
- » **Theme**  
Autonomous Multi-Agent System
- » **Goal**  
Design and deploy a production-ready multi-agent platform.
- » **Focus Areas**  
LangChain, LlamaIndex  
Agent Orchestration  
Cost & Security Optimization
- » **Output**  
Agent Platform + Monitoring Dashboard

## Portfolio Presentation Deck

Combine both capstones into a professional presentation showcasing architecture, code, outcomes, and ROI.



# Program Completion Certificate



Earn valuable credentials with a certificate and accredited with NAAC A+ (2021).  
Join India's largest DS & AI alumni network of over 10,000 professionals.



## Faculty



**Dr. Debabrata Das**  
Director of IIITB



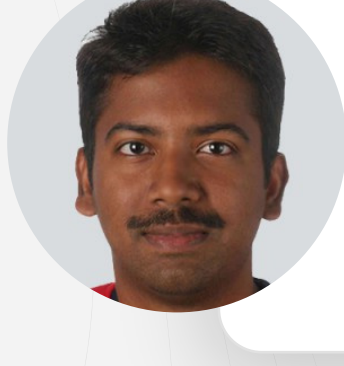
He has received his PhD from IIT-KGP. His main areas of research are IoT and Wireless Access Network.



**Prof. G. Srinivasaraghavan**  
Professor, IIITB



Prof. Srinivasaraghavan has a PhD in Computer Science from IIT-K and 18 years of experience with Infosys Technologies and several other companies.



**Dr. Dinesh Babu Jayagopi**  
Professor, IIITB



Dr. Dinesh is currently an Associate Professor at IIIT-B where he heads the Multimodal Perception Lab. His research interests are in Audio-Visual Signal Processing, Machine Learning, and Social Computing. He obtained his doctorate from Ecole Polytechnic Federale Lausanne (EPFL), Switzerland.



**Chandrashekar Ramanathan**  
Professor & Dean (Academics)



Prof. Chandrashekar is a faculty member at IIIT-B since 2007 serving as professor, researcher and administrator. He has been working in the field of Computing for over 25 years in various capacities across industry and academia.



**Tricha Anjali**  
Ex-Associate Dean



Prof. Anjali has a PhD from Georgia Institute of Technology as well as an integrated MTech (EE) from IIT Bombay.



**Dr. V. Sridhar**  
Professor

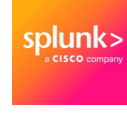


Dr. V. Sridhar, a professor at IIIT-Bangalore's CITAPP, specializes in telecommunications technology, management, and regulation. He has co-authored two books, published numerous articles in leading journals, and written about 300 articles on Telecom and IT in major business newspapers and magazines.

## Industry Experts



**Abhishek Vijayvargia**  
Senior Data Scientist



Having worked with Microsoft as a Senior Data Scientist, he is an alumnus of IIT Kharagpur with 10+ years of experience in a Data Science domain



Ex-Senior Data Scientist



**Anand**  
CEO



CEO, Gramener A gold medallist from IIM Bangalore, an alumnus of IIT Madras and London Business School, Anand is among the top 10 data scientists in India with 20 years of experience.



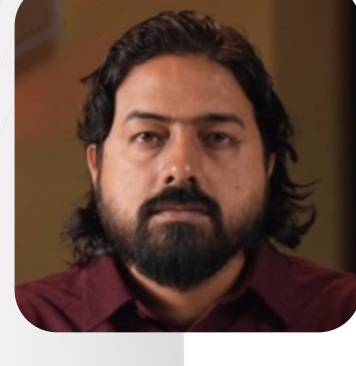
Faculty



Principal



Ex-Consultant



**Manish Shukla**  
Head of Generative AI



Leading cutting-edge GenAI platform development at NatWest Group. Expertise in OpenAI products and MLOps for optimisation of operational efficiency and seamless project delivery with high user satisfaction.



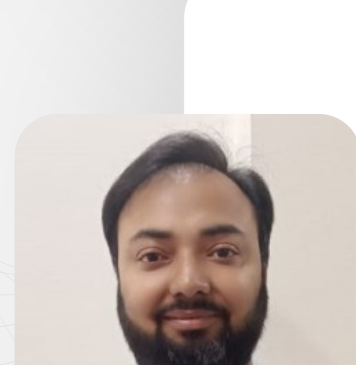
Release Manager



Release Manager



Certified Scrum Master



**Deependra Singh**  
VP & Head of Data Science



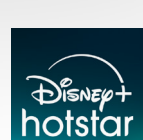
Over 15 years of experience in leading analytics practices, data science, deep learning, and AI product development. Successfully led teams at Junglele Games, American Express Digital Business, and National Insurance Company, pioneering key projects like the analytics engine for the GOI PMJAY policy. Respected speaker at top educational institutes like IMT Hyderabad, BIT Mesra, and NMIMS.



नेजस्वि नावधीतमस्तु



**Sajan Kedia**  
Sr. Engineering manager



Senior Engineering Manager, Hotstar Sajan has extensive experience in the field of ML, Big Data, Data Science, and AI.



Sr. Engineering manager



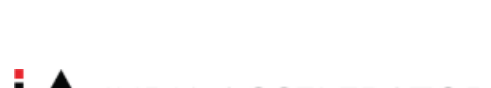
Machine Learning Engineer



Machine Learning Research Engineer



**Mirza Rahim Baig**  
Startup Mentor



Analytics Lead, Zalando Mirza is a veteran professional with 10+ years of experience in application of data science, machine learning in e-commerce and healthcare.



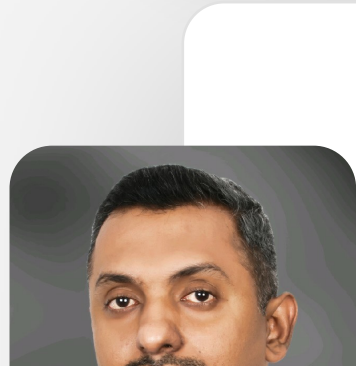
Team Lead - Product



Marketing Analytics



Ex-Analytics Lead



**Rajesh Sabapathy**  
Chief Data Scientist

Sr. Data Scientist, Healthcare sector

Rajesh, an AI/ML leader, has driven innovation in healthcare using deep learning and big data. With expertise in Python, P. and cloud platforms, he has delivered significant business value and collaborated across various industries. Formerly Distinguished Engineer at Fortune 5 Healthcare Giant

Health-tech Start-up



## Microsoft-Certified Advantage –

This program doesn't just prepare you for the world of Data Science & AIML—it gives you the Microsoft edge.

Learners earn industry backed certification from upGrad in association with Microsoft by completing specially designed modules integrated into the program, boosting both credibility and career readiness.



### Microsoft Learn content modules Certification Modules:

- Introduction to Generative AI Concepts
- Introduction to GitHub Copilot
- Design & Manage Analytics Solutions using Power BI
- Designing & Implementing a Data Science Solution on Azure



# Microsoft AI Immersion | Bangalore

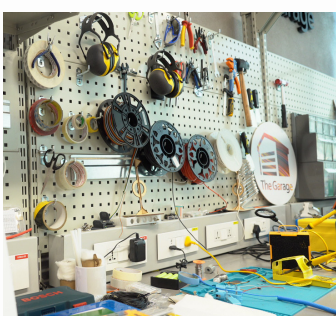
Go beyond theory. In this exclusive, hands-on immersion led by Microsoft experts, you'll:

- Master advanced AI-powered collaboration & automation tools
- Build muscle memory with real-world Microsoft applications
- Gain insider strategies directly from the creators of the technology

### Why It Matters:

- Global Recognition – Microsoft badges showcase your skills worldwide
- Career Differentiator – Employers value certified Microsoft professionals
- Practical Edge – Learn tools you'll use daily in analytics, AI, and cloud

With industry backed certification from upGrad in association with Microsoft certification + IITB's academic rigour, you graduate with **dual credibility**: academic excellence and industry validation.





# Build A Strong Portfolio



- **Commits**  
Demonstrate consistency, collaboration, and coding discipline
- **Code**  
Showcase well-documented repositories
- **Projects**  
Host end-to-end DS/ML/AI projects that highlight real-world problem-solving

## GitHub helps with

- ✓ Validating coding skills
- ✓ Showing growth and consistency
- ✓ Being interview-ready for Tech roles



- **Kernels**  
Highlight data processing and EDA methodologies
- **Ranking**  
Evaluate and reflect global standing among data science practitioners
- **Competitions**  
Demonstrate problem-solving under tight constraints

## Kaggle helps with

- ✓ Building credibility in data science circles
- ✓ Applying learning to real datasets
- ✓ Speaking confidently in Tech interviews



- **Headline**  
Concise summary of goals, competencies, and professional identity
- **Summary**  
Engaging overview of learnin and career journey
- **Projects**  
Showcase practical experience, outcomes, and skill application

## LinkedIn helps with

- ✓ Improving visibility with recruiters
- ✓ Positioning better for job openings
- ✓ Networking with peers and mentors in the field

*Disclaimer: All product names, logos, brands, and trademarks are property of their respective owners. All company, product, and service names used on this platform are for identification and educational purposes only. The use of these names, logos, and brands does not imply any endorsement, affiliation, or partnership with the respective trademark holders.*

# Rich and Dedicated Live Support

## Industry Expert Sessions

Engage with industry practitioners as they help you master in-demand skills and concepts using a demonstrative hands-on approach



## IIITB Faculty Sessions

Learn from some of the most accomplished academicians as they take your knowledge and understanding of data science to another level



## Just-In-Time Interview Support

Participate in Technical and HR mock interviews designed to boost your confidence and prepare you to ace interviews.



## Career Coaching Sessions

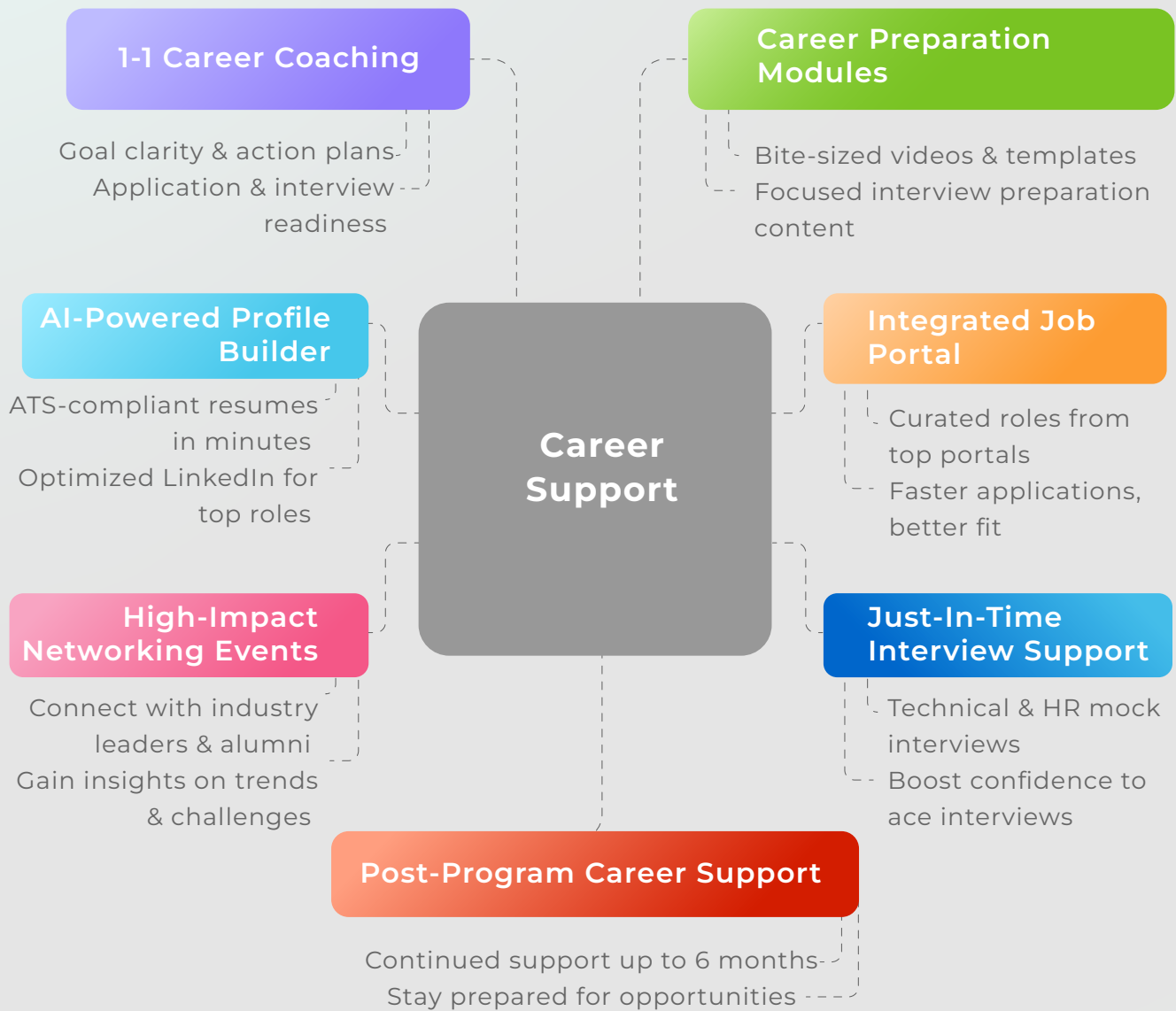
Engage in Career Coaching Sessions via Career preparation modules, High-impact networking events and Just-in-time mock interviews



## Daily doubt resolution sessions

Join doubt resolution session slots, that are available daily, and have an expert available to resolve your queries for a smooth learning journey

# Effective and Complete Career Support



## Student Support

### Telegram channel for learner communications

Cohort Telegram channel for timely program updates and announcements.

### Completion Support

Personalised assistance for smooth program completion, managing backlogs, and cohort deferrals with free and paid waiver options.

### Non-academic and non-technical query assistance

24 X 7 m-AI-ask bot support for non academic assistance.

### Financial benefits

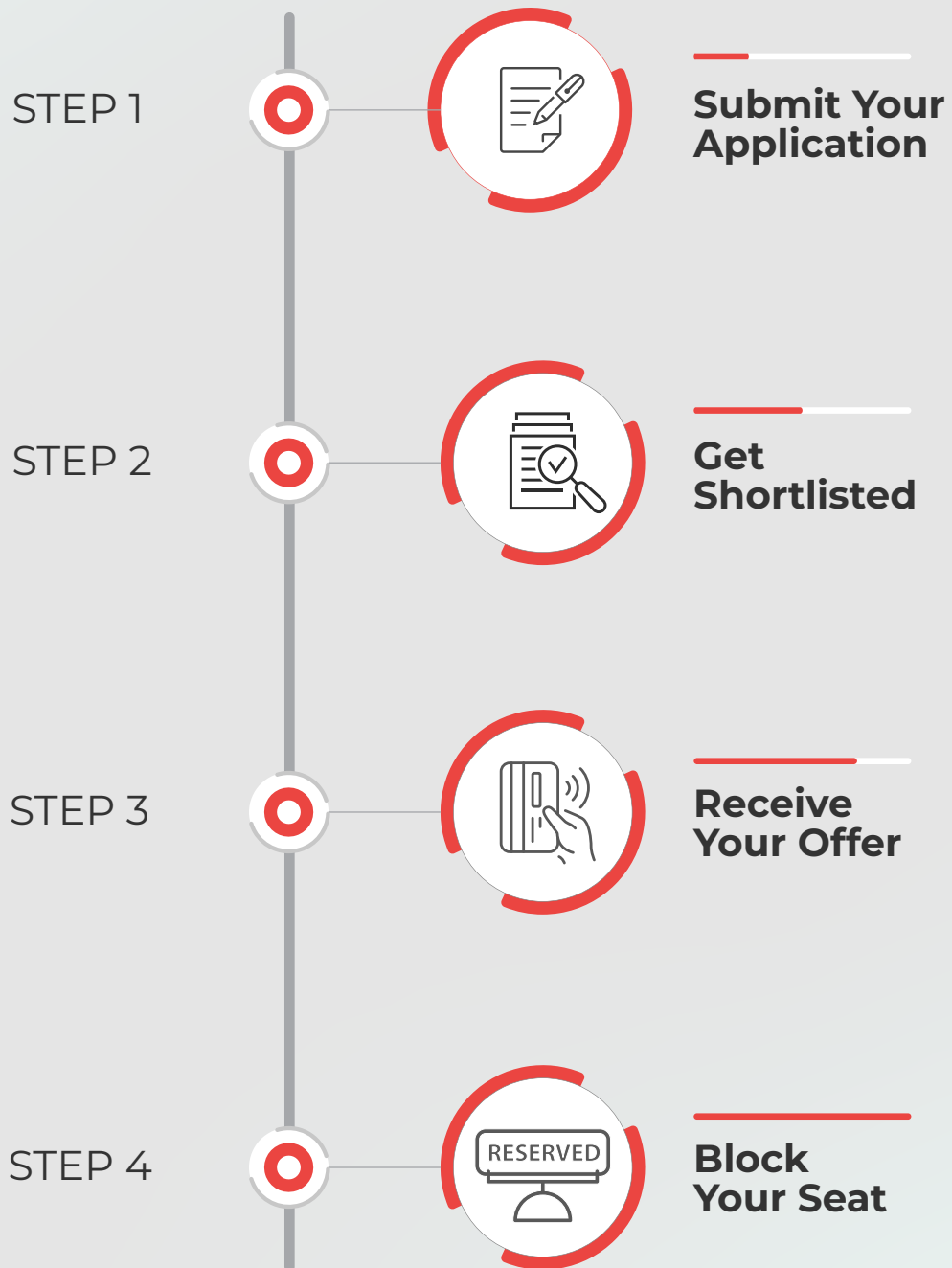
Access benefits like referrals and repeats by sharing details with your program co-ordinator or student support executive.



# Admissions & How To Apply

## Eligibility Criteria

- Graduates & Undergraduates (preferably in the final year)





**Write to us:**

[admissions@upgrad.com](mailto:admissions@upgrad.com)



**Visit us at:**

[www.upgrad.com](http://www.upgrad.com)



**Call:** 1800-210-2020

**upGrad**

LET'S TALK

