

upGrad

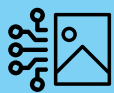


International  
Institute of Information  
Technology Bangalore

ज्ञानमुक्तमम्

Executive PG Programme in

# Machine Learning & Artificial Intelligence



Now Integrated with  
**Generative AI**

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# THE ERA OF GENERATIVE AI



The world is at the cusp of Generative AI rapidly changing the world as we know it. At upGrad, we've always believed in imparting learners the skills necessary to thrive in the fast-evolving world of technology. We are hence quite thrilled to pioneer Generative AI as an elective in Executive PG Programme in Machine Learning & Artificial Intelligence.

With this key inclusion of Generative AI, learners will delve deeper into the fascinating realm of using Machine Learning & AI to build practical applications like conversational AI chatbots, image creators, and content recommenders amongst others to solve real-world challenges. So dive into this brave new world of Generative AI and Large Language Models with us, and watch yourself transform into a 10x ML/AI Engineer.

“IIT Bangalore prides itself in constantly updating cutting-edge topics to its curriculum. Our faculty has shaped this exciting Generative AI elective along with upGrad’s industry experts, ensuring both academic rigour and incorporating the latest advancements in tech.”

**Dr. V. Sridhar**  
Head-Faculty, IITB

“As an organisation that asks professionals to stay updated with the latest skills, we had to be one of the first to teach Generative AI. With this move, we are excited to witness the impact that Generative AI will have on the future, as well as the value our learners will bring to the field with this essential skill.”

**Mayank Kumar, Co-founder & MD,**  
upGrad

# WHY UPGRAD?

**433%**  
Highest Hike

**1.23 Cr**  
Highest Salary

**50%**  
Avg Salary Hike

**10 Million+**  
Learners

**5k**  
Experts

**300+**  
Hiring Partners

# ABOUT

## UPGRAD AND IIITB

*upGrad has delivered over 20 million hours of learning, delivering programs by collaborating with universities across the world including Duke CE, IIIT Bangalore and Deakin Business School among others.*

Online education is a fundamental disruption that will have a far-reaching impact. **upGrad** was founded taking this into consideration. upGrad is an online education platform to help individuals develop their professional potential in the most engaging learning environment.

Since inception, upGrad has delivered over 20 million hours of learning, delivering programs by collaborating with universities across the world including Duke CE, IIIT Bangalore and Deakin Business School among others.

upGrad is focused on helping working professionals in their bid to learn, grow and move up in their career through a wide range of programs designed to improve their expertise.

**IIITB** is a renowned university offering programs specializing in data science, machine learning and artificial intelligence. The IIITB faculty includes an average of 15+ years of experience.

The faculty covers the conceptual depths of topics such as Data Science, Machine Learning and Artificial Intelligence, and Big Data Analytics. These will be complemented by industry-relevant case studies from major industry verticals by industry leaders with 8+ years of experience from upGrad's industry network.

The Executive PG Programme in ML & AI has been developed with the experienced faculty of IIITB in collaboration with industry experts and upGrad to bring you a cutting-edge curriculum with industry relevance. The strong placement network, industry mentorship, and credibility of this Executive PG Programme from IIITB will provide you with just the right push to accelerate your career in Machine Learning and AI!

# PROGRAM HIGHLIGHTS

## **Executive PG Programme from IITB and Alumni Status**

Get certified by IITB and gain alumni status on successful completion of the program.

## **For the Industry, by the Industry**

Learn and apply concepts on industry projects and work on a Capstone Project along with personalised industry mentorship.

## **Blended Learning**

Learn with the ease and flexibility of recorded sessions as well as live sessions, designed to ensure a wholesome learning experience.

## **Cutting-Edge Curriculum**

Master advanced ML and AI concepts developed by industry experts and faculty.

# FACULTY AND INDUSTRY EXPERTS



## **Mirza Rahim Baig**

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

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## **Chandrashekar Ramanathan**

Dean Academics, IIITB

Prof. Chandrashekar has a PhD from Mississippi State University and experience of over 10 years in several multinational organisations.

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## **S. Anand**

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.

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## **Ujjayini Mitra**

Head of Analytics, Zee5

An alumna of McKinsey and Co., Flipkart, and Bharti Airtel with over 11 years of experience.

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## **Anshuman Gupta**

Director - Data Science, Pitney Bowes

He has a PhD (Dual) from Penn State University as well as a BTech Degree from IIT Bombay.

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## **Gunjan Narulkar**

Director, AI/ML Product R&D, Fidelity

Gunjan has extensive experience in AI- ML products and R&D and is currently working as a director at Fidelity Investments.



### **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

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### **Ankit Jain**

ML Engineering Manager, Meta

Ankit is an experienced AI Researcher/Machine Learning Engineer and is currently works as an engineering manager at Meta (Facebook).

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### **Dinesh Babu Jayagopi**

Associate Professor, IIITB

Prof. Dinesh has a PhD from EPFL Switzerland, an MSc from IISc Bangalore in System Science and Signal Processing and BTech.

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### **Kalpana Subbaramappa**

Ex-AVP, Genpact

Kalpana is the ex-AVP of Decision Sciences at Genpact with over 20 years of experience.

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### **Srinath Srinivasa**

Professor and Dean (R&D), IIITB

He holds a PhD in Information Systems from the Berlin Brandenburg Graduate School, Germany, and is a recipient of various international grants for his research activities.

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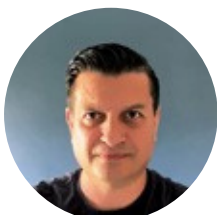


### **Chandramouleeswaran**

Adjunct Faculty, IIITB

He has 33+ years of experience in networking, embedded SW, ML. He is an Adjunct faculty at IIIT Bangalore and a visiting faculty at IIIT Lucknow, handling courses on AI for IoT and Python.

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### **Georgios Ouzounis**

Head of ML Engineering, Atlas AI

Technologist and visionary with over 22 years of experience and serving as the head of ML Engineering at Atlas AI in California, USA.





### **Arihant Jain**

Head of Data Science & Risk, IIFL Finance

Arihant is an expert in the field of Machine Learning technologies and is currently heading Data Science and Risk at IIFL Finance.

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### **Usha Rengaraju**

Chief of Research, Exa Protocol

She hails from the prestigious Harvard as well as Columbia University. She is a unicorn data scientist and have over 10 years of industry experience.

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### **Snehansu Sekhar Sahu**

Applied Scientist, Amazon

Snehansu is currently working as an applied scientist at Amazon . Prior to Amazon Sne- hansu was the Senior AI Researcher in ML & AI for Amex.

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### **Chiranjoy Chowdhuri**

Chief Analytics Officer, Pidilite

Chiranjoy is a Data, Analytics and AI practitioner with 13 years' experience and In his current role, he is the Global Head of Data and Analytics at Pidilite Industries.

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### **Sajan Kedia**

Machine Learning Lead, Myntra

Sajan has extensive experience in the field of ML, Big Data, Data Science, and AI. He is the Machine learning lead at Myntra .

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### **Rohit Ghosh**

Founding Member & Chief Strategy Officer, Qure.ai.

Rohit is an IIT-Bombay grad and is currently Founding Member and chief Strategy Officer of Qure.ai.

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### **Raghuram Bharadwaj**

Assistant Professor

Raghuram received his PhD. from Indian Institute of Science (IISc). As an expert in GenerativeAI, his main research interests are in the areas of Reinforcement Learning, Deep Learning, Machine Learning, Game theory, and Multi-agent learning

# UPGRAD LEARNING EXPERIENCE

## Student Support Team

- We have a dedicated Student Support Team for handling your queries via email or callback requests
- Student Support is available 7 days a week, 24\*7 for non-academic queries. You can write to us via [studentsupportupgrad.com](mailto:studentsupportupgrad.com) or for urgent queries, use the “Talk to Us” option on the Learn platform

## Networking & Learning

- Live Discussion forum for peer to peer doubt resolution monitored by technical experts
- Reverse knowledge transfer sessions (FLIP classrooms) with learners tutoring fellow batchmates
- Peer to peer networking opportunities with alumni pool of 10000+
- Lab walkthroughs of industry-driven projects

## Industry Mentors

- Fortnightly personalised group (1:8) mentorship sessions with industry expert for proactive mentoring
- Calls with industry experts for personalised feedback & guidance spread over 3 months

## Hands-on Projects

- 12+ projects & assignments and a Capstone Project to choose from 6 options
- Live coding classes on Kaggle & OpenCV & sessions on building your Github profile

# INDUSTRY PROJECTS

## Telecom

Solve the most crucial business problem for a leading telecom operator in India and southeast Asia - predicting customer churn.

## Classification of customer complaints

Create a solution that will help in identifying the type of complaint ticket raised by the customers of a multinational bank.

## Credit Card Fraud Detection

Build a machine learning model capable of detecting fraudulent transactions. Here you have to predict fraudulent credit card transactions with the help of machine learning models.

## Melanoma Detection Assignment

Build a neural network from scratch in Tensorflow to identify the type of skin cancer from image.

## Train an agent to play Tic Tac Toe

Learners will apply Q-Learning to train an RL agent to play the game of numerical Tic Tac Toe.

## Gesture Recognition

Make a Smart TV system which can control the TV with user's hand gestures as the remote control.

## Sales Forecasting

Predict the sales for a european pharma giant using a host of different types of variables. Apply VAR and VARMAX models to build the appropriate model.

## Machine Translation System

To build an attention based Encoder-Decoder architecture for translating between English to Hindi & vice versa.

## Face Mask detection

Create a custom object detector using the YOLO algorithm to detect the presence of face masks in the images of different people.

## Style Transfer using GAN's

Build a Model for converting MRI images from one type (T1) into other (T2) and vice versa. CycleGAN model is used for producing T2 type MRI images given T1 type input MRI images.

## News Recommender System

Build a model using the concepts of natural language processing and recommender systems to recommend news stories to users on a popular news platform.

## Maximizing Profit of Cab Driver using RL

Learners will use the Markov Decision Process & Q-Learning to build an RL agent that learns to choose the best request so as to maximize the total profit earned by the agent that day.

## Custom Entity Detection in Healthcare Data

You will build a custom NER to get the list of diseases and their treatment from a medical healthcare dataset.

## Eye for the Blind Data

Build a model that can help any visually impaired person in understanding image present before them. It is a deep learning model which can explain the content of an image in the form of speech. You will build a custom NER to get the list of diseases and their treatment from a medical healthcare dataset.

## Sentiment Analysis based Product Recommender system

Build a sentiment analysis based product recommendation system to recommend the similar products to the users. Sentiment analysis is used to fine tune the product recommendation system.

## Customer Churn prediction

To create an ML system that can predict the propensity of customers cancelling the subscription plan. The aim of the project is to provide the marketing team with insights into why a customer is choosing to leave. This will assist in identifying the probability of customer churn in the future so that preventive action can be taken.

## Lead Scoring project

To build a lead scoring ML system that can remove junk calls by categorising leads on the basis of propensity to purchase. The system built should be able to reduce the customer acquisition costs in the long run.

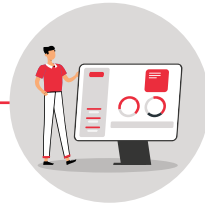
## Data Strategy project

Help in creating a Data / AI Strategy for an ecommerce company by creating their roadmaps, solutions for use cases & prioritization frameworks.

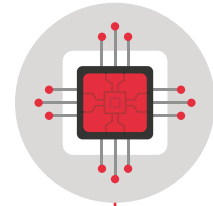
# LEARNING PATH



**Data Science Toolkit**  
Preparatory Content



**Statistics and  
Git Essentials**  
(5 weeks)



**Machine Learning I**  
7 weeks



**Natural Language Processing**  
7 weeks



**Deep Learning**  
8 weeks



**Machine Learning II**  
7 weeks



**Electives  
(DL with Mlops, NLP  
with Mlops & AI  
Strategy)**  
10 weeks



**Capstone**  
4 weeks




**Executive PG  
Programme in Machine  
Learning and Artificial  
Intelligence**

# PROGRAMMING TOOLS, LANGUAGES AND LIBRARIES

 pandas matplotlib NumPy

NLTK

 Seaborn scikit-learn statsmodels OpenCV mlflow

{ REST:API }

 docker Flask aws

PYCARET

 Apache Airflow TensorFlow Keras MySQL python

spaCy

# PROGRAM CURRICULUM

## PRE-PROGRAM PREPARATORY CONTENT (3 WEEKS)

1

### INTRODUCTION TO PYTHON

Build a foundation for the most in-demand programming language of the 21st century.

2

### PYTHON FOR DATA SCIENCE

Learn how to manipulate datasets in Python using Pandas, which is the most powerful library for data preparation and analysis.

3

### DATA VISUALISATION IN PYTHON

Humans are visual learners and hence no task related to data is complete without visualisation. Learn to plot and interpret various graphs in Python and observe how they make data analysis and drawing insights easier.

4

### DATA ANALYSIS USING SQL (OPTIONAL)

Data in companies is definitely not stored in excel sheets! Learn the fundamentals of database and extract information from RDBMS using the structured query language.

5

### ADVANCED SQL AND BEST PRACTICES (OPTIONAL)

Apply advanced SQL concepts like windowing and procedures to derive insights from data and answer pertinent business questions.

6

### DATA ANALYSIS IN EXCEL

Taught by one of the most renowned data scientists in the country (S.Anand, CEO, Gramener), this module takes you from a beginner level Excel user to an almost professional user.

7

### ANALYTICS PROBLEM SOLVING

This module covers concepts of the CRISP-DM framework for business problem-solving.

8

### MATH FOR MACHINE LEARNING

Learn the prerequisite mathematical tools and techniques for ML - Linear Algebra and Multi-variable Calculus.

## STATISTICS AND EXPLORATORY DATA ANALYTICS (5 WEEKS)

1

### EXPLORATORY DATA ANALYSIS

Learn how to find and analyse the patterns in the data to draw actionable insights.

2

### CLOUD ESSENTIALS: INTRO TO GIT & GITHUB

Learn version control, collaborating, portfolio making using git. Understand the process of creating repository. Learn the process of creating github portfolio using github pages with jekyll

### 3 **INFERENCE STATISTICS**

Build a strong statistical foundation and learn how to 'infer' insights from a huge population using a small sample.

### 4 **HYPOTHESIS TESTING**

Understand how to formulate and validate hypothesis for a population to solve real-life business problems.

### 5 **LENDING CLUB CASE STUDY**

Determine which customers are at risk of default and what are their characteristics so as to avoid providing loans to similar people in the future.

## **MACHINE LEARNING I (7 WEEKS)**

### 1 **LINEAR REGRESSION**

Venture into the machine learning community by learning how one variable can be predicted using several other variables through a housing dataset where you will predict the prices of houses based on various factors.

### 2 **LINEAR REGRESSION ASSIGNMENT**

Build a model to understand the factors car prices vary on and help a Chinese company enter the US car market.

### 3 **LOGISTIC REGRESSION**

Learn your first binary classification technique by determining whether customers of a telecom operator are likely to churn to help the business retain customers.

### 4 **NAIVE BAYES**

Understand the basic building blocks of Naive Bayes and learn how to build an SMS Spam Ham Classifier using Naive Bayes technique.

### 5 **MODEL SELECTION**

Learn the pros and cons of simple and complex models and the different methods for quantifying model complexity, along with regularisation and cross validation.



## **MACHINE LEARNING II (7 WEEKS)**

1

### **ADVANCED REGRESSION**

Understand generalised regression and different feature selection techniques, along with the perils of overfitting and how it can be countered using regularisation.

2

### **ADVANCED REGRESSION ASSIGNMENT**

Build a model to understand the factors house prices vary on and help an American company enter the Australian housing market.

3

### **SUPPORT VECTOR MACHINE (OPTIONAL)**

Learn how to find a maximal marginal classifier using SVM, and use them to detect spam emails, recognise alphabets and more!

4

### **TREE MODELS & RANDOM FORESTS**

Learn how the human decision making process can be replicated using a decision tree and other powerful ensemble algorithms.

5

### **MODEL SELECTION: PRACTICAL CONSIDERATIONS**

Given a business problem, how do you choose the best algorithm? Learn a few practical tips for doing this here.

6

### **BOOSTING**

Learn how weak learners can be 'boosted' with the help of each other and become strong learners using different boosting algorithms such as Adaboost, GBM, and XGBoost.

7

### **UNSUPERVISED LEARNING: CLUSTERING**

Learn how to group elements into different clusters when you don't have any pre-defined labels to segregate them through K-means clustering, hierarchical clustering, and more.

8

### **UNSUPERVISED LEARNING: PRINCIPAL COMPONENT ANALYSIS**

Understand important concepts related to dimensionality reduction, the basic idea and the learning algorithm of PCA, and its practical applications on supervised and unsupervised problems.

9

### **TELECOM CHURN CASE STUDY**

Solve the most crucial business problem for a leading telecom operator in India and southeast Asia - predicting customer churn.

## DEEP LEARNING (8 WEEKS)

1

### INTRODUCTION TO NEURAL NETWORKS

Learn the most sophisticated and cutting-edge technique in machine learning - Artificial Neural Networks or ANNs.

2

### CONVOLUTIONAL NEURAL NETWORKS - INDUSTRY APPLICATIONS

Learn the basics of CNN and OpenCV and apply it to Computer Vision tasks like detecting anomalies in chest X-Ray scans, vehicle detection to count and categorise them to help the government ascertain the width and strength of the road.

3

### CONVOLUTIONAL NEURAL NETWORKS - ASSIGNMENT

Build a neural network from scratch in Tensorflow to identify the type of skin cancer from image

4

### RECURRENT NEURAL NETWORKS

Ever wondered what goes behind machine translation, sentiment analysis, speech recognition etc. ? Learn how RNN helps in these areas having sequential data like text, speech, and videos, etc.

5

### NEURAL NETWORKS PROJECT: GESTURE RECOGNITION

Make a Smart TV system which can control the TV with user's hand gestures as the remote control.

## NATURAL LANGUAGE PROCESSING (7 WEEKS)

1

### LEXICAL PROCESSING

Do you get annoyed by the constant spams in your mail box? Wouldn't it be nice if we had a program to check your spellings?

In this module learn how to build a spell checker & spam detector using techniques like phonetic hashing, bag-of-words, TF-IDF, etc.

2

### SYNTACTICAL PROCESSING

Learn how to analyse the syntax or the grammatical structure of sentences using POS tagging and Dependency parsing.

3

### SYNTACTIC PROCESSING - ASSIGNMENT

Use the techniques such as POS tagging and Dependency parsing to extract information from unstructured text data.

4

### SEMANTIC PROCESSING

Learn the most interesting area in the field of NLP and understand different techniques like word-embeddings, topic modelling to build an application that extracts opinions about socially relevant issues.

- 5 CASE STUDY: CLASSIFYING CUSTOMER COMPLAINT TICKETS**  
In this case study you will create a solution that will help in identifying the type of complaint ticket raised by the customers of a multinational bank.

## **ELECTIVE 1: MLOPS (15 WEEKS)**

- 1 PRE-REQUISITE MODULE**  
Builds upon foundational knowledge of DevOps, focusing on its application in the context of machine learning.
- 2 INTRODUCTION TO MLOPS**  
This module provides an overview of MLOps, focusing on the principles and practices of integrating machine learning into the software development lifecycle.
- 3 DESIGNING MACHINE LEARNING SYSTEMS**  
Guides students in designing ML systems from ideation to prototyping to product delivery, emphasizing robustness, reusability, reproducibility and maintainability.
- 4 EXPERIMENTING WITH DATA AND MODEL USING MLFLOW**  
Hands-on experience with MLflow, managing end-to-end machine learning lifecycle, including experiment tracking, model packaging, and version management.
- 5 AUTOMATING AND ORCHESTRATING PIPELINES WITH AIRFLOW**  
Students will learn how to create and schedule workflows, manage dependencies between tasks, and monitor pipeline execution using Airflow.
- 6 BUILDING CONTINUOUS LEARNING INFRASTRUCTURE**  
This module covers the concepts and techniques required to establish a continuous learning infrastructure for ML models. Students will learn about data drift detection, model retraining strategies, and deployment strategies for updated models.
- 7 MLOPS PROJECT**  
In this assignment, students will apply the concepts and tools learned throughout the curriculum to develop an end-to-end MLOps solution.
- 8 ADVANCED NLP - INTRODUCTION TO ATTENTION MECHANISM**  
This module focuses on building sequence to sequence models using attention mechanism to build a Neural Machine Translation(NMT) model.
- 9 ADVANCED NLP - INTRODUCTION TO TRANSFORMERS**  
Explores Transformers architecture in NLP, diving deeper into self-attention mechanisms, multi-head attention, and positional encoding, with a focus on fine-tuning BERT models for sentence similarity..

**10 ADVANCED CV - OBJECT DETECTION & SEMANTIC SEGMENTATION**  
Covers advanced computer vision techniques, including object detection and semantic segmentation, with hands-on experience in training and evaluating models using popular algorithms and frameworks.

**11 MLOPS + DEPLOYMENT: DL (THEORY)**  
Provides theoretical foundations for deploying deep learning models in MLOps pipelines, including model training with AWS SageMaker and deployment considerations such as model serving, scalability, and performance optimization.

**12 MLOPS + DEPLOYMENT: DL (CASE STUDY)**  
In this case study, you will apply all your learnings from the previous module to perform an end to end deployment of a DL model using AWS Sagemaker.

## **ELECTIVE 2: GENERATIVE AI (15 WEEKS)**

**1 ADVANCED NLP - INTRODUCTION TO ATTENTION MECHANISM**  
This module focuses on building sequence to sequence models using attention mechanism to build a Neural Machine Translation(NMT) model

**2 ADVANCED NLP - INTRODUCTION TO TRANSFORMERS**  
Explores Transformers architecture in NLP, diving deeper into self-attention mechanisms, multi-head attention, and positional encoding, with a focus on fine-tuning BERT models for sentence similarity.

**3 INTRODUCTION TO GENERATIVE AI, CHATGPT & PROMPT ENGINEERING**  
Introduces students to the world of generative AI and various LLMs that have revolutionised the current industry, and enables learners to dive into that revolution by learning the nitty-gritties of writing a prompt of generate a desired outputs for complex tasks.

**4 ADVANCED PROMPTING & FINE TUNING IN PYTHON**  
Dive deeper into prompt engineering and learn how to structure prompts and outputs, and how you can use advanced prompting techniques such as chain-of-thought prompting, zero- and few-shot prompting, prompt injunctions, prompt parameter tuning. By the end of this module, learners will become proficient at defining prompts for most complex tasks.

**5 PRODUCT DEVELOPMENT & INTEGRATING SPEECH USING WHISPER API AND APPLICATION DEPLOYMENT USING FLASK**  
Learn the fundamentals of product development, and deploy your own GPT-enabled web app with the use of Flask.

**6 PROMPTING ON MULTIMODAL LLMS LIKE STABLE DIFFUSION, MID JOURNEY**  
Understand the fundamentals of design, photography and product development to generate images and multimodal outputs for businesses.

## **7 APPLICATIONS OF LLMs IN CODE GENERATION & DATA SCIENCE**

Write prompts to generate accurate codes for various general and data tasks, perform basic data processing and modelling tasks using ChatGPT and Copilot.

## **8 GENAI PROJECTS**

Apply your learnings to create various GenAI enabled applications such as Interview Gynie, PixxelCraft and ShrewdNewsAI

## **9 EMBEDDING LARGE DOCUMENTS WITH LLMs**

Understand the concepts of embeddings and take the first step towards building custom LLMs that involve integrating a database with your GenAI models.

## **10 STORING AND INDEXING EMBEDDINGS OF LARGE DOCUMENTS WITH VECTORSTORES LIKE PINECONE**

Embed large documents and datasets with the help of vectorstores like Pinecone to enhance ChatGPT's ability to understand context, avoid hallucinations, and perform accurately on data-specific tasks.

## **11 INTRODUCTION TO LANGCHAIN AND IT'S APPLICATIONS**

With the limitations of standalone LLMs, understand how LangChain can be used to overcome those limitations and help integrate GenAI models on specific data pools..

## **12 LANGCHAIN AGENTS, TOOLS, AND VECTORSTORES FOR STORAGE AND RETRIEVAL**

Understand how the different components of LangChain such as Models, Prompts, Indexes, Chains, Memory and Agents help building a GenAI model.

## **13 CONNECTING COMPONENTS USING CHAIN AND THE POWER OF TOOLS IN LANGCHAIN**

Understand how to connect components using chain, and how different inbuilt tools in Lang-Chain can be leveraged for your models.

## **14 SCALE AND DEPLOY GENERATIVE AI APPS USING AZURE OPENAI SERVICES**

Deploy your generative AI models using Azure OpenAI services and understand the considerations that go in when scaling generative AI models.

## **15 FUTURE DEVELOPMENTS IN GENERATIVE AI**

Understand what the future of AI holds (mitigating risks in AI, RLHF as a product, Multimodal Learning), both from the architecture and applications perspective.

### **CAPSTONE (4 WEEKS)**

#### **1 CAPSTONE**

Choose from a range of real-world industry woven projects on advanced topics like Recommendation Systems, Fraud Detection, GANs among many others.

#### **2 NEWS RECOMMENDER SYSTEM**

Build a model to using the concepts of natural language processing and recommender systems to recommend news stories to users on a popular news platform.

### **3 CREDIT CARD FRAUD DETECTION**

To build a machine learning model capable of detecting fraudulent transactions. Here you have to predict fraudulent credit card transactions with the help of machine learning models.

### **4 EYE FOR BLIND - (IMAGE CAPTIONING)**

Build a model that can help any visually impaired person in understanding image present before them. It is a deep learning model which can explain the content of an image in the form of speech.

### **5 SENTIMENT ANALYSIS BASED PRODUCT RECOMMENDER SYSTEM**

Build a sentiment analysis based product recommendation system to recommend the similar products to the users. Sentiment analysis is used to fine tune the product recommendation system.

### **6 SALES FORECASTING**

Predict the sales for a European pharma giant using a host of different types of variables. Apply VAR and VARMAX models to build the appropriate model

### **7 STYLE TRANSFER USING GAN'S**

Build a Model for converting MRI images from one type (T1) into other (T2) and vice versa. CycleGAN model is used for producing T2 type MRI images given T1 type input MRI images.

## **REINFORCEMENT LEARNING (OPTIONAL)**

### **1 CLASSICAL REINFORCEMENT LEARNING**

Ever wondered how Alpha Go beat the best GO player or how Boston Dynamics made robots that can run. Start your journey with the classical RL algorithms like dynamic programming, Monte Carlo methods, Q Learning to train the state value and action value functions of the policy.

### **2 ASSIGNMENT - CLASSICAL REINFORCEMENT LEARNING**

Train an agent that'll beat you in the game of numerical tic-tac-toe everytime you play

### **3 DEEP REINFORCEMENT LEARNING**

Want to build your own Atari Game? Learn the Q-function or policy using the various Deep Reinforcement Learning algorithms: Deep Q Learning, Policy Gradient Methods, Actor-Critic method.

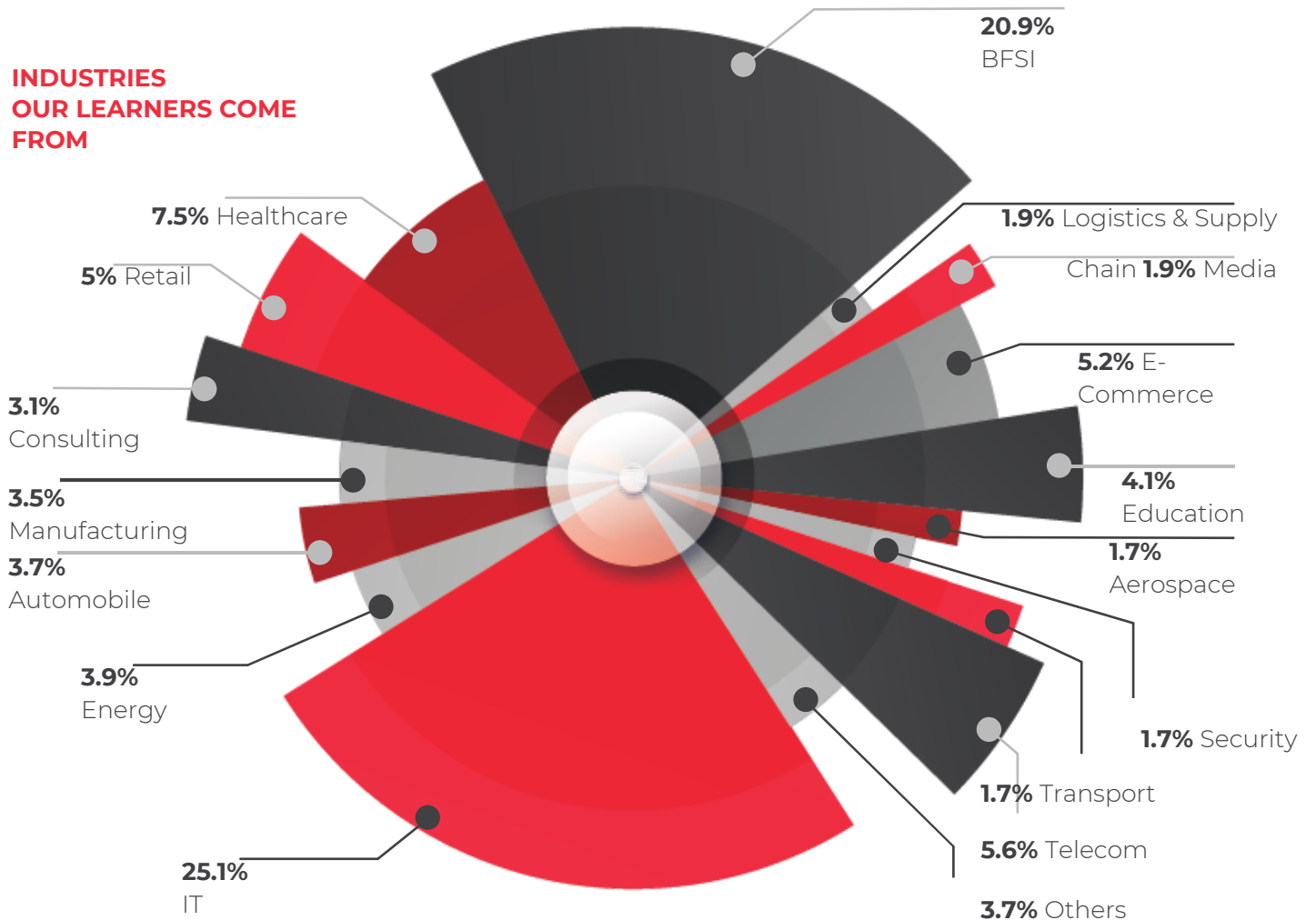
### **4 REINFORCEMENT LEARNING PROJECT**

Improve the recommendation of the rides to the cab drivers by creating a RL based algorithm using vanilla Deep Q-Learning (DQN) to maximize the driver's profits and in turn help in retention of the driver on the cab aggregator service.

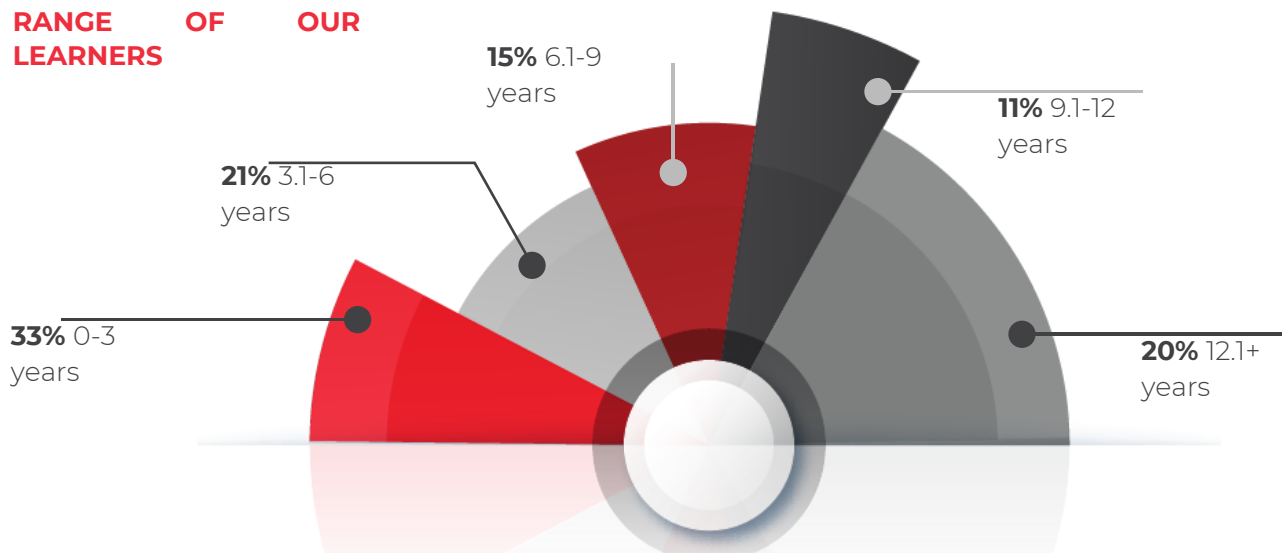
Disclaimer: Program curriculum is subject to change basis inputs from the institute and experts. Please refer to the website for update details, or speak to our Admission Counsellors.

# MEET THE CLASS

## INDUSTRIES OUR LEARNERS COME FROM



## WORK RANGE OF OUR LEARNERS



# CAREER SUPPORT

## Jobs on Career

Career Centre offering upGrad jobs across experience levels and CTC ranges.

- Easy apply feature for upGrad hiring partner vacancies
- Create resume at profile builder and with one click to apply for various jobs

## upGrad Elevate

- Recruitment Drive to connect you with the best talent admirers in the industry
- Get access to a wide range of opportunities and find the perfect job
- Apply your learnings to real industry problems

## Interview Preparation

Pre-recorded content on topics such as:

- Profile building, communications, etc
- Problem solving approach
- Approaching guesstimates
- Domain specific interview question bank and much more

## Profile Builder (AI-Powered)

An easy to use Resume, LinkedIn and Cover Letter preparation tool.

- Resume Score: AI-Driven Resume Score
- Real time recommendations to improve
- Match your resume to the JD and check fitment
- LinkedIn Profile Review
- Cover Letter Creation

## Just In Time Interview Prep

For upcoming job interviews, JITs are conducted within 48 hours for eligible programs.

- Tailored to job role and target domain
- Real time feedback and tips for improvement

## High Performance

Dedicated coaches working with you to identify best suited career opportunities.

- Help you define your value proposition
- Lay out a Career Path and help you adhere to your timelines and goals
- Help you with interview preparations, finding jobs in the market, salary negotiations and other preparation as required

## Personalised Industry

90-minute sessions biweekly by leading industry experts.

- Session categories: Career, Technical and Communications.
- Doubt resolution
- Develop proof of concepts and apply theoretical concepts in the real world
- Assess skill levels
- Peer Networking
- Classroom Element
- Business communication sessions and much more

## Career Mentorship Sessions

Get personalised career advice through 1-1 sessions with industry experts.

- Goal setting for better employment results



# EXPERIENCE UPGRAD OFFLINE

## UPGRAD ELEVATE

upGrad's Hiring Drive where you can interview with upGrad's 300+ hiring partners ensuring you get every opportunity you deserve.



## HACKATHONS & JOB OPPORTUNITIES

Team up and put your learning to use with our offline Hackathons designed to help you apply concepts and meet, network and grow! Being a top performer at Hackathons also provides the opportunity to interview at top firms.

# HEAR FROM OUR LEARNERS

**Saurav Kant Kumar, Experience: 3.6 Years**

*"After just 6 months of starting my AI and ML journey, I have been rewarded with a Data Scientist position in Tech Mahindra with a very hefty package and this is just after going halfway through the program. I can put my money on this program on any given day and assure everyone that this is one program that stands apart from every other in the market. The program pedagogy is impeccable but what I liked the most is the constant motivation from my student mentor which kept me going in the program."*

**Shashank Sane, Experience: 11 Years**

*"Overall it is a very well rounded program (and only one of the few) and while the topics are being covered in sufficient depth, it would not be useful to compare this with MOOC's or any other specialised programs covering only one of the topics. The primary importance of this program lies in the structured approach and well-rounded coverage (with the industry insights that it offers)."*

**Amarpal Singh, Experience: 17 Years**

*"According to me this particular program is pretty useful and adds value because of its structured approach, strict schedule, deadlines and the discipline in learning that the overall process brings along. The whole idea that you will spend almost a year learning about ML/AI in a structured and organized manner is the biggest USP of this program and what makes it different from other short term courses."*

**Gaurav Singh, Experience: 2 Years**

*"This program sets very high standards in the field of ML and AI. Before joining this program I searched about many other programs but none of them is at par to this program. Yes it's true that nothing is perfect in this world, but whenever they commit mistakes they are very fast to respond and do not hesitate to accept and rectify that. I am completely satisfied with what they have given me, your money will not get wasted and you will get opportunity to expose yourself to the field of ML and AI."*



# PROGRAM DETAILS AND ADMISSION PROCESS

## PROGRAM DURATION AND FORMAT

13 Months | Blended

## PROGRAM START DATES

Please refer to the website for program start dates.

[www.upgrad.com/machine-learning-ai-pgd-iiitb/](http://www.upgrad.com/machine-learning-ai-pgd-iiitb/)

## PROGRAM FEE

Please refer to the website for program fee  
[www.upgrad.com/machine-learning-ai-pgd-iiitb/](http://www.upgrad.com/machine-learning-ai-pgd-iiitb/)

## ELIGIBILITY

Bachelor's Degree with 50% or equivalent passing marks. Minimum 1 year of work experience in a technical domain or a degree in mathematics or Statistics with programming experience.

## WEEKLY COMMITMENT (15 hours/week)



### 7-8 HOURS

Asynchronous learning time.



### 7-8 HOURS

Assignments and projects.



### 1 LIVE SESSION

Every week.

## SELECTION PROCESS



### STEP 1: Online Eligibility Test

Fill out an application and take a quick 40-minute online test with 18 questions to assess your aptitude. 10 questions from mathematics, aptitude & reasoning & 8 questions from programming.



### STEP 2: Review and Shortlisting of Suitable Candidates

Our faculty will review all applications, considering the educational and professional background of an applicant and review the test scores where applicable. Following this, Offer Letters will be rolled out so you are assured a great peer group to learn and network with.



### STEP 3: Enrollment for Access to Prep Content

Make a quick block payment with assistance from our loan partners where required, receive immediate access to the prep content and begin your upGrad journey.

## FOR FURTHER INFORMATION, CONTACT

ai@upgrad.com  
1800 210 2020  
We are available  
24\*7

Disclaimer: Program fee and payment options are subject to change. Please refer to the website for updated details or speak to our admission counsellor.

# upGrad

## COMPANY INFORMATION

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Maharashtra 400018