



upGrad



International
Institute of Information
Technology Bangalore

PG Diploma in Machine Learning and AI

12 MONTHS | ONLINE

upGrad is an online education platform to help individuals develop their professional potential in the most engaging learning environment. Online education is a fundamental disruption that will have a far-reaching impact. At upGrad, we are working towards transforming this online education wave into a tsunami! We are taking a full-stack approach of leveraging content, technology, marketing and services to offer quality education at scale in partnership with corporates & academics to offer a rigorous & industry relevant program.

The field of Data Science is maturing rapidly and demands professionals skilled not only in Statistics, but also in advanced concepts such as Natural Language Processing and Neural Networks. Our vision is to design and deliver a quality online Post Graduate Diploma in Machine Learning/AI to produce top-notch Data Scientists and Machine Learning experts and help India capitalize the next wave of Artificial Intelligence. With upGrad, we promise to equip you with the perfect mix of business acumen and technical capabilities to help you contribute to this technological revolution.

Ronnie Screwvala

Co-founder & Chairman
upGrad



IIIT Bangalore is one of the leading institutes of higher education in the country and is a renowned name in the global analytics and IT industry. Our world-class faculty with years of teaching experience, have successfully worked with upGrad to deliver quality online executive education in Data Science.

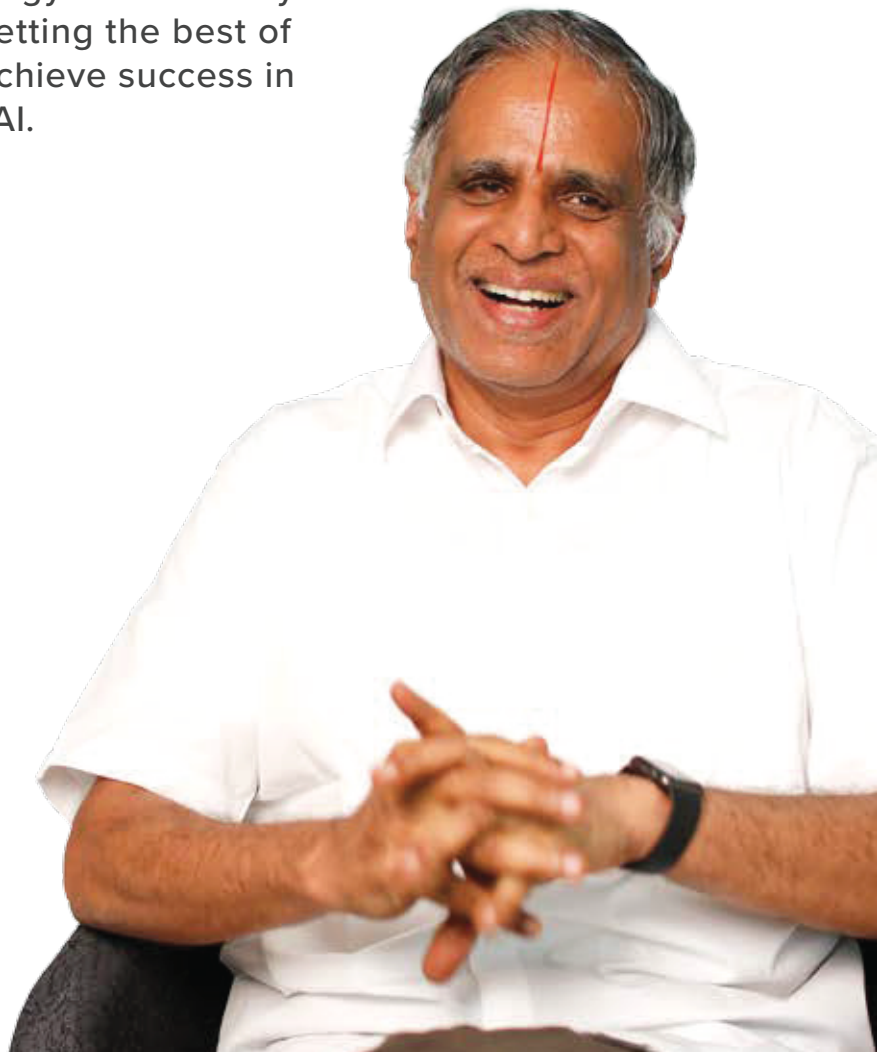
We are excited to partner with upGrad yet again, to offer an academically rigorous and industry-relevant PG Program in Machine Learning and AI. IIIT-B's faculty will be covering the conceptual depths of topics such as Neural Networks, Deep Learning and NLP and this will be complemented by case studies from industry leaders from upGrad's industry network. Further, our strong career support services, industry mentorship and the credibility of a PG Program will provide you just the right push to accelerate your career in Machine Learning and AI.

We invite you to take this opportunity and join us and make use of the excellent pedagogy and industry collaborations. You will truly be getting the best of both worlds, which will help you achieve success in the field of Machine Learning and AI.

Prof. S. Sadagopan

Director

IIIT Bangalore



WHY MACHINE LEARNING & AI WITH UPGRAD AND IIIT-B?



CUTTING EDGE CURRICULUM

Master advanced machine learning and artificial intelligence concepts



PG PROGRAM FROM IIIT-B

Earn a reputed Post Graduate Certificate without leaving your job



ON-THE-GO LEARNING

Learn the most recent advances in Machine Learning & Data Science by implementing them on 5+ projects



FOR THE INDUSTRY, BY THE INDUSTRY

Receive 1:1 mentoring from industry experts and execute 140+ hours of Industry lead projects and case studies



CAREER SUPPORT

Get access to career coaching services and get introduced to the right opportunities to upgrade yourself



INDUSTRY MENTORSHIP

Get unparalleled mentorship from ML and AI experts and student mentors

INSIGHTS FROM INDUSTRY EXPERTS



S. ANAND
CEO
Gramener



UJJYAINI MITRA
Head of Analytics
Viacom 18



HINDOL BASU
Partner
Tata IQ



KALPANA SUBBARAMAPPA
Ex-AVP, Decision Sciences
GENPACT



SAI ALLURI
PRO Analytics &
Strategy Manager
Uber



ANKIT JAIN
Data Scientist
Uber



RAJ ONKAR
Data Science Manager
Accenture



ANSHUMAN GUPTA, PHD
Director - Data Science
Pitney Bowes

CONCEPTS FROM TOP ACADEMICIANS



PROF. S. SADAGOPAN
Director
IIIT Bangalore



TRICHA ANJALI
Associate Professor
IIIT Bangalore



G SRINIVASARAGHAVAN
Professor
IIIT Bangalore



DINESH BABU JAYAGOPI
Assistant Professor
IIIT Bangalore



**CHANDRASHEKAR
RAMANATHAN**
Dean (Academics)
IIIT Bangalore



SRINATH SRINIVASA
Dean (R&D)
IIIT Bangalore

UPGRAD BASECAMP: OFFLINE MEET-UPS & LEARNING

Along with online learning, upGrad BaseCamp meet-ups act as a physical platform for extensive peer-to-peer learning, networking and idea exchanges. BaseCamp brings together, a hybrid offline and online learning experience for all the Learners and Alumni of upGrad. Held across major cities in India, these fun, yet informative and career building events add on to the already great learning experience that upGrad provides.

WHAT'S IN IT FOR OUR LEARNERS?



Networking with
Faculty and
Student Mentors



Career
Building
Sessions



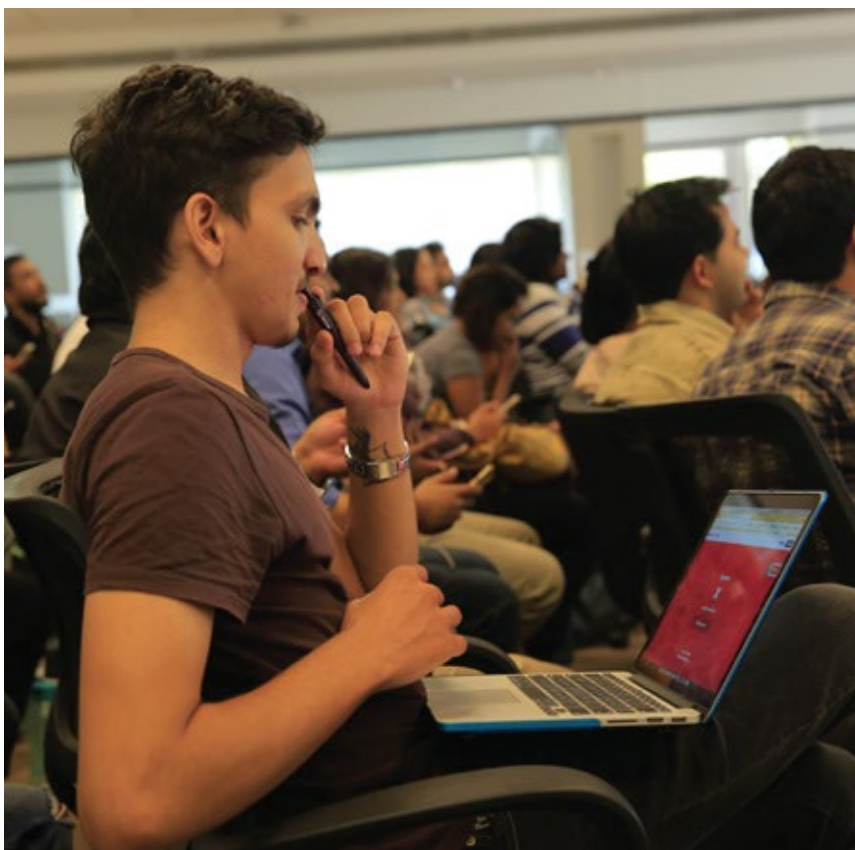
Engaging and
Live Group
Projects



Fun and
Exciting
Activities



Peer Interaction
and Career
Networking



PROGRAM CURRICULUM

Note: This curriculum is subject to change based on inputs from IIIT-B and Industry

PRE-PROGRAM PREPARATION

INTRODUCTION TO PYTHON

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

PYTHON FOR DATA SCIENCE

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

MATH FOR MACHINE LEARNING

Learn the fundamental mathematical concepts that'll make the understanding of ML algorithms better

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.

DATA ANALYSIS USING SQL

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.

ADVANCED SQL

Design a database from scratch and use programming constructs in SQL to extract data for advanced analysis

STATISTICS AND EXPLORATORY DATA ANALYTICS

ANALYTICS PROBLEM SOLVING

Understand the concepts of the CRISP - DM framework for business problem solving which is widely used in the industry.

INVESTMENT CASE STUDY

The students will fill in the shoes of an analyst at an investment bank and determine where the firm should invest. They will then have to explain their recommendations in lieu of the analysis conducted.

INFERENTIAL STATISTICS

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

HYPOTHESIS TESTING

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

EXPLORATORY DATA ANALYSIS

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

GROUP PROJECT

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

MACHINE LEARNING - 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.

INVESTMENT CASE STUDY

The students will fill in the shoes of an analyst at an investment bank and determine where the firm should invest. They will then have to explain their recommendations in lieu of the analysis conducted.

LINEAR REGRESSION ASSIGNMENT

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

LOGISTIC REGRESSION

Learn your first binary classification technique by determining which customers of a telecom operator are likely to churn versus who are not to help the business retain customers.

NAIVE BAYES

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

MODEL SELECTION

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

MACHINE LEARNING - 2

ADVANCED REGRESSION

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

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!

TREE MODELS

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

MODEL SELECTION - PRACTICAL CONSIDERATIONS

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

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.

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.

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.

TELECOM CHURN CASE STUDY

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

NATURAL LANGUAGE PROCESSING

LEXICAL PROCESSING

Do you get annoyed by the constant spams in yor 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.

SYNTACTIC PROCESSING

Learn how to analyse the syntax or the grammatical structure of sentences with the help of algorithms & techniques like HMMs, Viterbi Algorithm, Named Entity Recognition (NER), etc.

SYNTACTIC PROCESSING -ASSIGNMENT

Build a POS tagger for tagging unknown words using HMM's & modified Viterbi algorithm.

SEMANTIC PROCESSING

Learn the most interesting area in the field of NLP and understand different techniques like word-embeddings, LSA, topic modelling to build an application that extracts opinions about socially relevant issues (such as demonetisation) on social media platforms

BUILDING CHATBOTS WITH RASA

Imagine if you could make restaurant booking without opening Zomato. Build your own restaurant-search chatbot with the help of RASA - an open source framework and deploy it on Slack.

DEEP LEARNING

INTRODUCTION TO NEURAL NETWORKS

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

NEURAL NETWORKS - ASSIGNMENT

Build a neural network from scratch in Numpy to identify handwritten digits.

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 & categorise them to help the government ascertain the width and strength of the road.

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, videos, etc

NEURAL NETWORKS PROJECT - GESTURE RECOGNITION

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

REINFORCEMENT LEARNING

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.

ASSIGNMENT -CLASSICAL REINFORCEMENT LEARNING

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

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.

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 return help in retention of the driver on the cab aggregator service.

CAPSTONE

DEPLOYMENT

Learn how to productionize your model and deploy it on the server.

CAPSTONE

Choose from a range of real-world industry woven projects on advanced topics like Recommendation Systems, Fraud Detection, Emotion Detection from faces, Social Media Listening, Speech Recognition among many others.

PROGRAM DETAILS

PROGRAM STARTS

Please refer to the website for
program start date

**Preparatory sessions start on 10th of September*

WEEKLY COMMITMENT

15 hours per week

6-8 hours of asynchronous learning time
8-9 hours of assignments & projects
1 live session in every 2 weeks

DURATION

12 Months

PROGRAM FEE

INR 2,85,000 (Incl. of all taxes)

Flexible Payment Options Available

ELIGIBILITY

Bachelor's/Master's degrees in Computer
Science/Engineering/Math/Statistics/
Economics/Science with a minimum
of 50% marks in graduation

SELECTION PROCESS

Candidates are expected to fill out an appli-
cation form and then undergo a selection
test to assess college-level mathematics and
basic programming skill

For further details, call us at **+91-9136056345** or contact:



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Program Director

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