upGrad

International Institute of Information Technology Bangalore

Executive PG Programme in

DATA SCIENCE

Get the Whole Picture

Table of Contents

About upGrad

upGrad has delivered over 20 million hours of learning, delivering programs by collaborating with universities across the world including Duke CE, IIT Madras, 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.

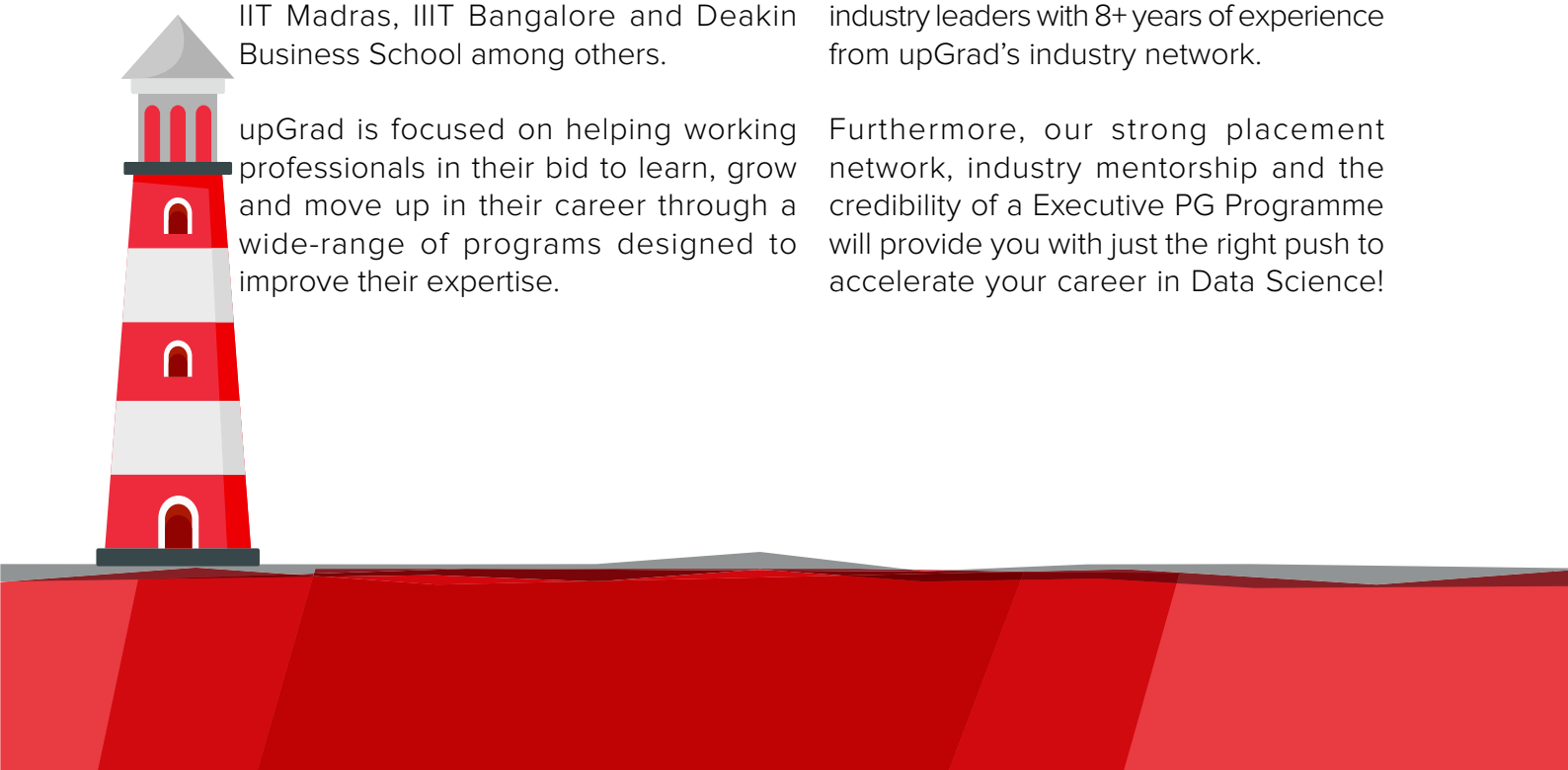
Since inception, upGrad has delivered over 20 million hours of learning, delivering programs by collaborating with universities across the world including Duke CE, IIT Madras, IIIT Bangalore and Deakin Business School among others.

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 specialising 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.

Furthermore, our strong placement network, industry mentorship and the credibility of a Executive PG Programme will provide you with just the right push to accelerate your career in Data Science!



85+
Countries Learners Base

Why upGrad?

400%
Highest Hike

58%
Avg Salary Hike

300+
Hiring Partners

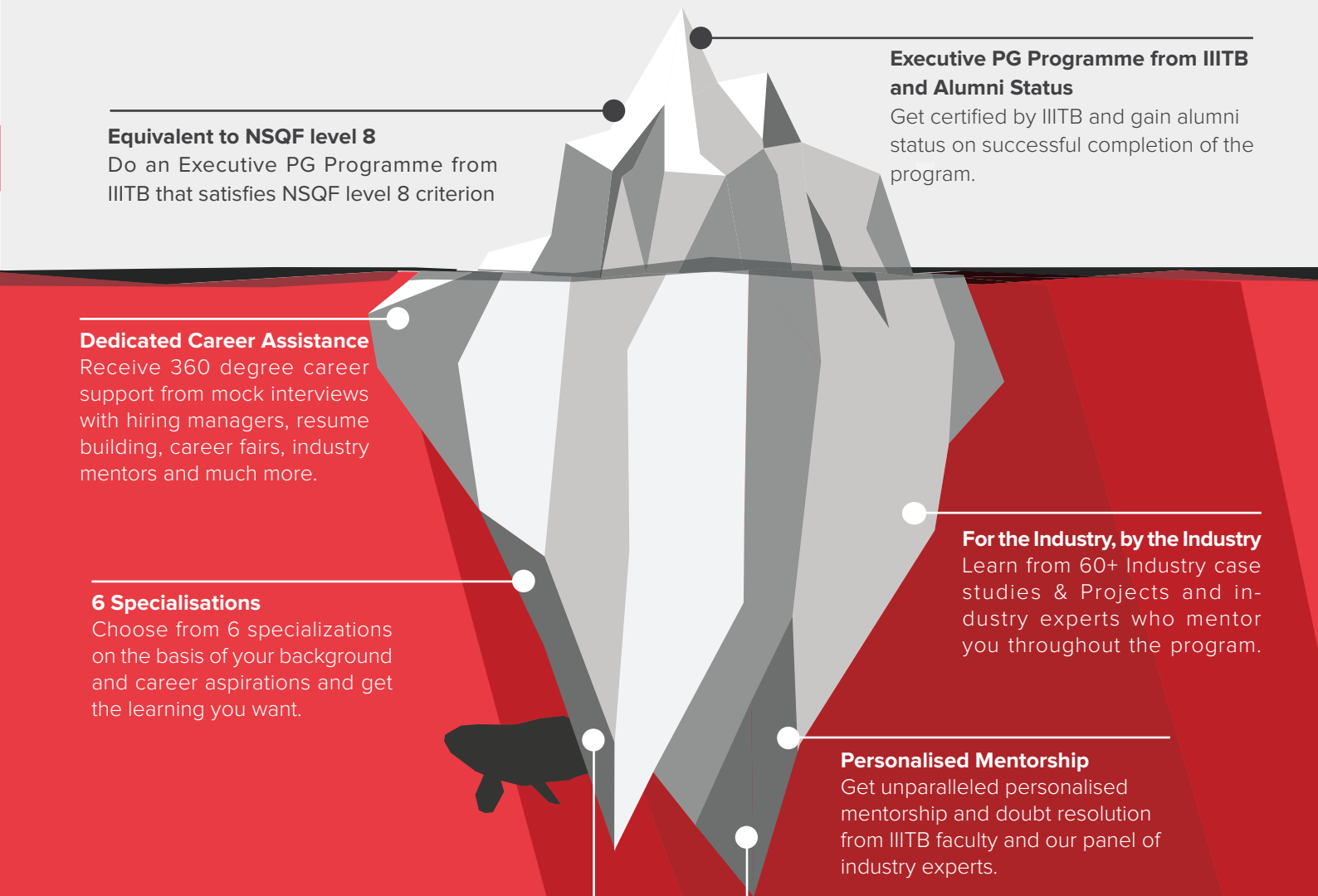
30,000+
Learners

700+
Industry Experts

Program Highlights

Executive PG Programme from IIITB and Alumni Status
Get certified by IIITB and gain alumni status on successful completion of the program.

Equivalent to NSQF level 8
Do an Executive PG Programme from IIITB that satisfies NSQF level 8 criterion



Dedicated Career Assistance
Receive 360 degree career support from mock interviews with hiring managers, resume building, career fairs, industry mentors and much more.

For the Industry, by the Industry
Learn from 60+ Industry case studies & Projects and in-dustry experts who mentor you throughout the program.

6 Specialisations
Choose from 6 specializations on the basis of your background and career aspirations and get the learning you want.

Personalised Mentorship
Get unparalleled personalised mentorship and doubt resolution from IIITB faculty and our panel of industry experts.

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

NASSCOM future skill certification
India's first Executive PG Programme validated by and recommended by NASSCOM. Avail a participation certificate from NASSCOM on successful program completion.

Faculty and Industry Experts

Hindol Basu
CEO, Actify Data Labs

An alumnus of IIT and IIM with over 13 years of experience in analytics with industry leaders such as Citigroup and Tata Industries.

Chandrashekar Ramanathan
Dean Academics, IIITB

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

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.

Tricha Anjali
Former Associate Dean, IIITB

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

Sameer Dhanrajani
Co-Founder and CEO, AIQRATE

Sameer Dhanrajani is an AI and Analytics evangelist for Fortune 500 companies who has won several industry awards in the field of analytics.

Prof. Debabrata Das
Director, IIITB

Dr. Debabrata Das is serving as Director of IIIT Bangalore (IIITB). He has completed his Ph.D. degree from the Indian Institute of Technology Kharagpur. His main areas of research interest are IoT and Wireless Access Network's MAC, QoS, Power saving.

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.

Ujjyaini Mitra
Head of Analytics, Zee5

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

Dinesh Babu Jayagopi
Associate Professor, IIITB

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

Kalpana Subbaramappa
Ex-AVP, Genpact

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

Ankit Jain
Sr. Research Scientist, Uber

An alumnus of IIT Bombay, UCB and Harvard Business School with over 9 years of experience.

Sajan Kedia
Lead Data Scientist (Pricing), Myntra

An alumnus of IIT with over 7 years of experience at Watson at IBM Research, startups and Myntra.

Mirza Rahim Baig
Lead Business Analytics, Flipkart

Advanced Analytics professional with 8+ years of experience as a consultant in the e-commerce and healthcare domains.

Bijoy Kumar Khandelwal
COO, Actify Data Labs

Bijoy comes with a deep understanding of the private and cloud architectures and has helped numerous companies make the transition.

Prof. V. Sridhar
Faculty In Charge, CPE, IIITB

Dr. Sridhar has a Ph.D. from the University of Iowa, U.S.A. He has been a member of Government of India committees on Telecom and IT and has published many peer reviewed articles in telecom and information systems journals.

upGrad Learning Experience

Coaching

- Student Support Team & upGrad Buddy
- Weekly real-time doubt clearing sessions
- Live Discussion forum for peer-to-peer doubt resolution monitored by technical experts
- Peer-to-peer networking opportunities with an alumni pool of 10,000+
- Lab walk-throughs of 25+ industry-driven case studies
- 6 Employability Tests for industry readiness
- Access to the program for up to 3 years

Mentorship

60+ live interactive sessions with industry experts, fortnightly personalised group (1:8) mentorship sessions with industry experts for pro-active mentoring.

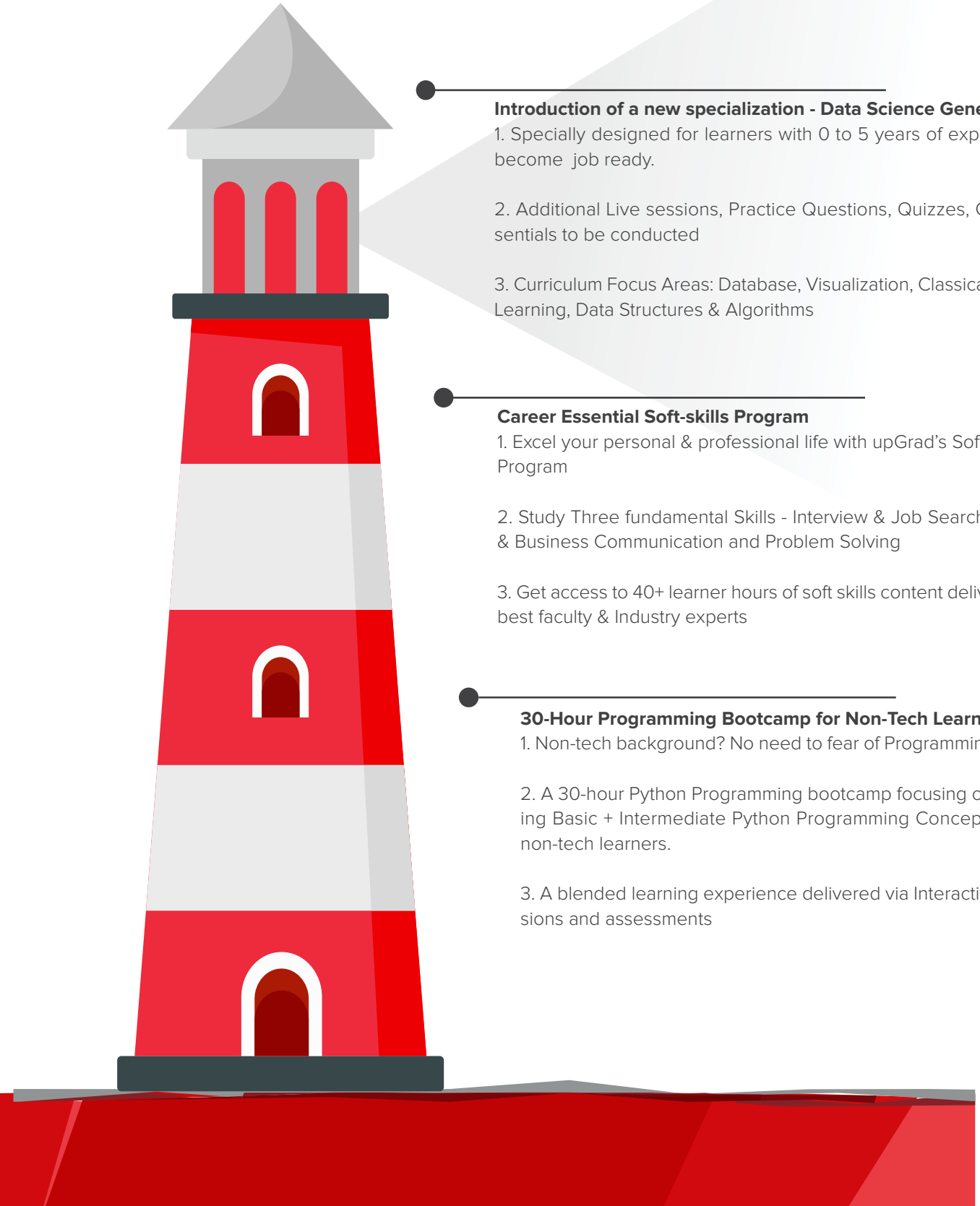
Format

Online format with weekly live sessions from industry experts to help with topic walk-throughs, doubt resolution and personalised project feedback. Offline sessions such as Basecamps and Hackathons.

Hands-On Projects and Hackathons

60+ Industry case studies & projects to choose from as well as a Capstone Project to apply learnings.

New Additions



Introduction of a new specialization - Data Science Generalist

1. Specially designed for learners with 0 to 5 years of experience to become job ready.

2. Additional Live sessions, Practice Questions, Quizzes, Career Essentials to be conducted

3. Curriculum Focus Areas: Database, Visualization, Classical Machine Learning, Data Structures & Algorithms

Career Essential Soft-skills Program

1. Excel your personal & professional life with upGrad's Soft Skills Program

2. Study Three fundamental Skills - Interview & Job Search, Corporate & Business Communication and Problem Solving

3. Get access to 40+ learner hours of soft skills content delivered by the best faculty & Industry experts

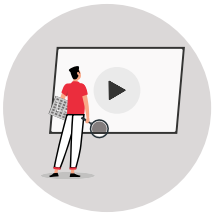
30-Hour Programming Bootcamp for Non-Tech Learners

1. Non-tech background? No need to fear of Programming anymore

2. A 30-hour Python Programming bootcamp focusing on developing Basic + Intermediate Python Programming Concepts to assist non-tech learners.

3. A blended learning experience delivered via Interactive live sessions and assessments

Industry Projects



IMDb Movie Analysis

Uber Supply-Demand Gap

Lead Scoring

Fraud Detection

Creditworthiness of Customers

Speech Recognition

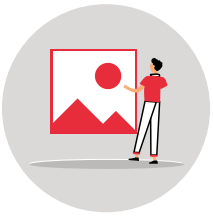
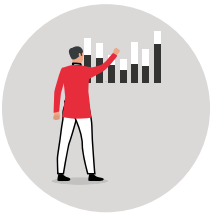


Image Captioning

Gesture Recognition

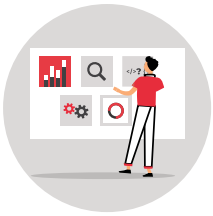
Social Media Listening

Telecom Churn



Interactive Market Campaign Analysis

Retail Giant Sales Forecasting



And many more!

Learning Path

Preparatory Course
2 weeks
Tools: Python, Excel

Data Toolkit
14 weeks
Tools: Python, Excel, mySQL

Machine Learning
9 weeks
Tools: Python, Excel

Choose any of the 6 Specialisations
25 weeks (with 6 weeks of Capstone)

Data Science Generalist
Tools: Python, Tableau, SQL

Natural Language Processing
Tools: Python, Excel

Deep Learning
Tools: Python, Exce TensorFlow

Business Analytics
Tools: Python, mySQL, Excel

Business Intelligence/ Data Analytics
Tools: Python, Power BI, Excel, mySQL, MongoDB, Shiny, Tableau

Data Engineering
Tools: Hadoop, HBase, Sqoop, Hive, Flume, PySpark, Spark, Airflow

Executive PG Programme in Data Science (Data Science Generalist)

Executive PG Programme in Data Science (Natural Language Processing)

Executive PG Programme in Data Science (Deep Learning)

Executive PG Programme in Data Science (Business Analytics)

Executive PG Programme in Data Science (Business Intelligence/ Data Analytics)

Executive PG Programme in Data Science (Data Engineering)

Executive PG Programme in Data Science

COMMON CURRICULUM

PRE-PROGRAM PREPARATORY CONTENT

1 **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.

2 **ANALYTICS PROBLEM SOLVING**
This module covers concepts of the CRISP-DM framework for business problem-solving.

TOOLS COVERED: **EXCEL**

DATA TOOLKIT

2 ASSIGNMENTS

1 **INTRODUCTION TO PYTHON - I**
Build a foundation for the most in-demand programming language of the 21st century.

2 **INTRODUCTION TO PYTHON - II**
Learn to apply some of the commonly used paradigms of functional programming in Python.

3 **PROGRAMMING IN PYTHON**
Learn how to approach and solve logical problems using programming.

4 **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.

5 **PYTHON FOR DATA SCIENCE**
Learn how to manipulate datasets in Python using Pandas which is the most powerful library for data preparation and analysis.

6 **VISUALIZATION 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.

7 **EXPLORATORY DATA ANALYSIS**
Learn how to find and analyse the patterns in the data to draw actionable insights.

8 **IMDB MOVIE ASSIGNMENT**
Reinforce the concepts learnt in data science through this rigorous assignment involving the past hundred years of movie data.

**The Curriculum is subject to change as per the inputs from university or industry experts*

9 **MATHS FOR DATA SCIENCE**
Build the mathematical foundation required for understanding the Machine Learning Algorithms.

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

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

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

13 **CREDIT EDA CASE STUDY**
Solve a real industry problem through the concepts learnt in exploratory data analysis.

TOOLS COVERED: PYTHON, MYSQL, EXCEL

MACHINE LEARNING

3 ASSIGNMENTS

1 **INTRODUCTION TO MACHINE LEARNING AND 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 - BIKE SHARING SYSTEMS**
Build a model to understand the factors on which the demand for bike sharing systems vary on and help a company optimise its revenue.

3 **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.

4 **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.

5 **BUSINESS PROBLEM SOLVING**
Learn how to approach open ended real world problems using data as a lever to draw actionable insights.

6 **CLUSTERING ASSIGNMENT (OPTIONAL)**
Apply the machine learning concepts learnt to help an internation NGO cluster countries to determine their overall development and plan for lagging countries.

7 **CASE STUDY: LEAD SCORING**
Help the Sales team of your company identify which leads are worth pursuing through this classification case study.

TOOLS COVERED: PYTHON

**The Curriculum is subject to change as per the inputs from university or industry experts*

SPECIALISATION 1:
DATA SCIENCE GENERALIST

ADVANCED MACHINE LEARNING AND STORYTELLING

3 ASSIGNMENTS

1 **TREE MODELS + BOOSTING (OPTIONAL)**
Learn how the human decision making process can be replicated using a decision tree and other powerful ensemble algorithms.

2 **MODEL SELECTION & GENERAL ML TECHNIQUES**
Learn the pros and cons of simple and complex models and the different methods for quantifying model complexity, alongwith general machine learning techniques like feature engineering, model evaluation, and many more.

3 **ML LAB I: CLASSIFICATION**

4 **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.

5 **ADVANCED REGRESSION - I**
In this module, take a more advanced look at regression models and learn the concepts related to regularization.

6 **ADVANCED REGRESSION - II &**
ML LAB II: REGRESSION

7 **TEXT ANALYTICS & PROCESSING + TEXT-BASED PREDICTIVE MODELLING**
An introduction to the world of NLP and basic text processing skills. Learn how to build a classification engine that works on (unstructured) textual data.

8 **BASIC VISUALISATION USING TABLEAU**
Learn advanced visualisation techniques using the most in-demand visualization tool in the industry.

9 **DATA STORYTELLING**
Learn how to effectively strategise, communicate, and fine grain your data analysis projects and understand how to optimally present your findings to technical and non-technical stakeholders and upgrade your storytelling skills.

10 **BUSINESS CASE STUDY**

TOOLS COVERED: PYTHON, TABLEAU

ADVANCED PROGRAMMING AND DATABASES

2 ASSIGNMENTS

1 **DATA MODELLING**
In this module, you will learn and use data modelling on a dataset to solve a business problem.

**The Curriculum is subject to change as per the inputs from university or industry experts*

2 **SQL WEEKLONG LAB**

3 **ADVANCED SQL - WEEK II**
Apply advanced SQL concepts like windowing and procedures to derive insights from data and answer pertinent business questions

4 **ALGORITHM ANALYSIS + RECURSION**
Learn how to assess the efficiency your code using algorithm analysis techniques and learn to write recursive algorithms

5 **SEARCHING AND SORTING (DIVIDE AND CONQUER INCLUDED)**
Learn most fundamental searching and sorting algorithms and design techniques

6 **DATA STRUCTURES - SETS, DICTIONARIES, STACKS, QUEUES**
Learn user defined data structures -Stack, Queue, Trees in Python that help in advanced data manipulation

7 **PYTHON - OOPS**
Learn OOP concepts such as Class, Object, Method, Inheritance, Polymorphism, Data Abstraction and Encapsulation.

8 **PYTHON WEEKLONG LAB**

TOOLS COVERED: PYTHON, SQL

CAPSTONE PROJECT

1 **CAPSTONE PROJECT**
Solve an end-to-end real-life industry problem from a wide variety of domains. Make a video presentation of your working demo to showcase in your portfolio.

**The Curriculum is subject to change as per the inputs from university or industry experts*

SPECIALISATION 2:
NATURAL LANGUAGE PROCESSING

ADVANCED MACHINE LEARNING
2 ASSIGNMENTS

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

2 **MODEL SELECTION & GENERAL ML TECHNIQUES**
Learn the pros and cons of simple and complex models and the different methods for quantifying model complexity, alongwith general machine learning techniques like feature engineering, model evaluation, and many more.

3 **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.

4 **ADVANCED REGRESSION**
In this module, take a more advanced look at regression models and learn the concepts related to regularization.

5 **ADVANCED REGRESSION ASSIGNMENT**
Build a regularized regression model to understand the most important variables to predict the house prices in Australia.

6 **BAGGING AND BOOSTING**
Learn about ensemble modelling through bagging and boosting and understand how weak algorithms can be transformed into stronger ones.

7 **TIME SERIES ANALYSIS**
In this module, you will learn how to analyse and forecast a series that varies with time.

8 **TELECOM CHURN CASE STUDY**
Solve the most crucial business problem for a leading telecom operator in India and southeast Asia - predicting customer churn.

TOOLS COVERED: PYTHON

NATURAL LANGUAGE PROCESSING
2 ASSIGNMENTS

1 **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.

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

**The Curriculum is subject to change as per the inputs from university or industry experts*

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.

CAPSTONE

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

2 **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.

SPECIALISATION 3:
DEEP LEARNING

ADVANCED MACHINE LEARNING

2 ASSIGNMENTS

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

2 **MODEL SELECTION & GENERAL ML TECHNIQUES**
Learn the pros and cons of simple and complex models and the different methods for quantifying model complexity, alongwith general machine learning techniques like feature engineering, model evaluation, and many more.

3 **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.

4 **ADVANCED REGRESSION**
In this module, take a more advanced look at regression models and learn the concepts related to regularisation.

**The Curriculum is subject to change as per the inputs from university or industry experts*

5 **ADVANCED REGRESSION ASSIGNMENT**
Build a regularized regression model to understand the most important variables to predict the house prices in Australia.

6 **BAGGING AND BOOSTING**
Learn about ensemble modelling through bagging and boosting and understand how weak algorithms can be transformed into stronger ones.

7 **TIME SERIES ANALYSIS**
In this module, you will learn how to analyse and forecast a series that varies with time.

8 **TELECOM CHURN CASE STUDY**
Solve the most crucial business problem for a leading telecom operator in India and southeast Asia - predicting customer churn.

TOOLS COVERED: PYTHON

DEEP LEARNING AND NEURAL NETWORKS

2 ASSIGNMENTS

1 **INTRODUCTION TO NEURAL NETWORKS**
Learn the most sophisticated and cutting-edge technique in machine learning - Artificial Neural Networks or ANNs.

2 **NEURAL NETWORKS ASSIGNMENT**
Build a neural network from scratch in Numpy to identify handwritten digits.

3 **CONVOLUTIONAL NEURAL NETWORKS - INTRODUCTION AND 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.

4 **RECURRENT NEURAL NETWORKS**
Ever wondered what goes behind machine translation, sentiment analysis, speech recognition? Learn how RNN helps in these areas having sequential data like text, speech, videos, and a lot more.

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

TOOLS COVERED: PYTHON, TENSORFLOW, KERAS, OPENCV

CAPSTONE

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

2 **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

**The Curriculum is subject to change as per the inputs from university or industry experts*

SPECIALISATION 4:
Business Analytics

ADVANCED MACHINE LEARNING
2 ASSIGNMENTS

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

2 **TIME SERIES FORECASTING**
In this module, you will learn how to analyse and forecast a series that varies with time.

3 **RETAIL-GIANT SALES FORECASTING ASSIGNMENT**
Apply the concepts learnt in time series to solve a forecasting problem for a retail giant.

4 **MODEL SELECTION & GENERAL ML TECHNIQUES**
Learn the pros and cons of simple and complex models and the different methods for quantifying model complexity, alongwith general machine learning techniques like feature engineering, model evaluation, and many more.

5 **SQL BEST PRACTICES**
Learn how to write optimized SQL query that require less memory and execute in lesser amount of time.

6 **ADVANCED EXCEL**
Learn the advanced concepts in Excel and start to perform data analysis like a pro!

7 **TELECOM CHURN CASE STUDY**
Solve the most crucial business problem for a leading telecom operator in India and southeast Asia - predicting customer churn.

TOOLS COVERED: PYTHON, MYSQL,EXCEL

BUSINESS REQUIREMENTS
2 ASSIGNMENTS

1 **STRUCTURED PROBLEM SOLVING USING FRAMEWORKS**
Learn how to attack a business problem using various structured frameworks like 5W, 5WHYs, and SPIN.

2 **STRUCTURED PROBLEM SOLVING ASSIGNMENT**
Apply your learnings from the course to solve a real-life business problem.

3 **OPERATIONS RESEARCH**
Learn about the world of operations research through linear and integer optimisations.

4 **DATA STORYTELLING**
Learn how to effectively strategise, communicate, and fine grain your data analysis projects and understand how to optimally present your findings to technical and non-technical stakeholders and upgrade your storytelling skills.

**The Curriculum is subject to change as per the inputs from university or industry experts*

5 **OPERATIONS RESEARCH CASE STUDY**
Understand how a project in the industry is taken up and solved through a comprehensive business case study.

TOOLS COVERED: PYTHON, EXCEL

CAPSTONE PROJECT

5 ASSIGNMENTS

1 **CAPSTONE PROJECT**
Solve an end-to-end real-life industry problem from a wide variety of domains. Available capstone project choices -
(i) Stock Analysis & Portfolio Management
(ii) E-Commerce & Marketing
(iii) Heatlhcare
(iv) Supply Chain Optimisation
(v) Credit Card Fraud Detection

TOOLS COVERED: PYTHON, EXCEL, TABLEAU

SPECIALISATION 5:
BUSINESS INTELLIGENCE / DATA ANALYTICS

SQL AND NOSQL DATABASES

2 ASSIGNMENTS

1 **DATA MODELLING**
In this module, you will learn and use data modelling on a dataset to solve a business problem.

2 **SQL BEST PRACTICES**
Learn how to write optimized SQL query that require less memory and execute in lesser amount of time.

3 **SQL ASSIGNMENT: IMDB MOVIES**
In this assignment, you will work on a movies dataset using SQL to extract exciting insights.

4 **ADVANCED EXCEL**
Learn the advanced concepts in Excel and start to perform data analysis like a pro!”

5 **NOSQL DATABASES AND BEST PRACTICES**
Take your knowledge of query languages a step further by learning about MongoDB - a NoSQL database which is becoming more and more popular in the industry.

6 **INTRODUCTION TO BIG DATA AND CLOUD**
Understand the basics of big data and cloud and learn to work with an EMR cluster on a cloud-based service.

7 **HIVE AND QUERYING**
In this module, you learn about the architecture and features of the Hive Query Language.

8 **HIVE CASE STUDY**
Understand how a project in the industry is taken up and solved through a comprehensive business case study.

**The Curriculum is subject to change as per the inputs from university or industry experts*

TOOLS COVERED: **MYSQL, MONGODB, AWS, HQL**

STORYTELLING WITH ADVANCED VISUALISATIONS

2 ASSIGNMENTS

1 **VISUALISATION USING TABLEAU**
Learn advanced visualisation techniques using the most in-demand visualization tool in the industry.

2 **SPORTS ANALYTICS - IPL VISUALISATION ASSIGNMENT**
Apply the new found Excel and Tableau skills to solve an exciting business assignment.

3 **VISUALISATION USING POWERBI**
Take your visualization game a step forward by understanding how to operate PowerBI.

4 **VISUALISATION USING PLOTLY**
Get a brief introduction to another popular open-sourced visualisation library in Python and learn to code and create powerful, pretty, and interactive visualisations.

5 **DATA STORYTELLING**
Learn how to effectively strategise, communicate, and fine grain your data analysis projects and understand how to optimally present your findings to technical and non-technical stakeholders and upgrade your storytelling skills.

6 **PLOTLY CASE STUDY**
Understand how a project in the industry is taken up and solved through a comprehensive business case study.

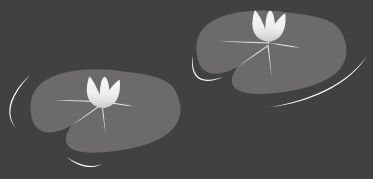
TOOLS COVERED: **TABLEAU, POWERBI**

CAPSTONE PROJECT

5 ASSIGNMENTS

1 **CAPSTONE PROJECT**
Solve an end-to-end real-life industry problem from a wide variety of domains. Available capstone project choices -

(i) Web & Social Media Analytics
(ii) Finance and Risk Analytics
(iii) Marketing and Retail Analytics
(iv) Supply Chain Analytics
(v) Fraud Analytics



TOOLS COVERED: **TABLEAU, PYTHON, EXCEL**

SPECIALISATION 6:
DATA ENGINEERING

DATA ENGINEERING I

4 ASSIGNMENTS (1 Mandatory, 3 optional)

1 **INTRODUCTION TO BIG DATA(OPTIONAL)**
This module you will learn what big data is, its various characteristics, and its determining factors. You will also get an idea of the various sources of big data and the wide range of big data applications in different industries such as retail, healthcare, and finance.

**The Curriculum is subject to change as per the inputs from university or industry experts*

2 **INTRODUCTION TO CLOUD AND AWS SETUP**
Understand what is cloud and setup your AWS account which will be required duing the program.

3 **INTRODUCTION TO HADOOP AND MAPREDUCE PROGRAMMING**
Understand the world of distributed data processing and storage with Hadoop. Learn to write MapReduce jobs in Python.

4 **MAPREDUCE PROGRAMMING ASSIGNMENT (OPTIONAL)**
Practise MapReduce Programming on a Big Dataset.

5 **DATA MANAGEMENT AND RELATIONAL DATABASE MODELLING**
Understand the concepts of Data Management and learn to model data from a Relational Database.

6 **NOSQL DATABASES AND APACHE HBASE**
NOSQL DATABASES AND MONGODB(OPTIONAL)
Learn the concepts of NoSQL databases. Understand the working of Apache HBase.

7 **DATA WAREHOUSING (OPTIONAL)**
Understand the intricacies behind designing a data warehouse and a data lake for use case/s.

8 **DATA INGESTION WITH APACHE SQOOP AND APACHE FLUME**
Get familiar with the challenges involed in data ingestion. Use Sqoop and Flume to ingest structured and unstructured data into Hadoop.

9 **HIVE & QUERYING**
Manage and query a data warehouse with Apache Hive. Learn to write optimized HQL for large scale data analysis.

10 **HIVE ASSIGNMENT (OPTIONAL)**
Use HQL to analyse a Big Dataset

11 **AMAZON REDSHIFT**
Learn to deploy a Redshift cluster and use it for querying data.

12 **INTRODUCTION TO APACHE SPARK**
Get introduced to Apache Spark, a lighting fast big data processing engine.

13 **NYC PARKING ASSIGNMENT (OPTIONAL)**
Practise Apache Spark and its core libraries on the NYC Parking Ticket dataset.

14 **PROJECT: ETL DATA PIPLINE**
Make use of Sqoop, Redshift & Spark to design an ETL data pipeline.

TOOLS COVERED: AWS EC2, CLOUDERA DISTRIBUTION OF HADOOP, APACHE HADOOP, APACHE MAPREDUCE, APACHE HBASE, MONGODB, APACHE SQOOP, APACHE FLUME, APACHE HIVE, AMAZON REDSHIFT, APACHE SPARK, MYSQL, AMAZON REDSHIFT

**The Curriculum is subject to change as per the inputs from university or industry experts*

DATA ENGINEERING - II

3 ASSIGNMENTS (1 Mandatory, 2 optional)

1 **OPTIMISING SPARK FOR LARGE SCALE DATA PROCESSING**
Use PySpark to create large scale data processing applications.

2 **APACHE FLINK(OPTIONAL)**
Get Introduced to Apahce Flink and learn query batch data. Use DataStream API to create a stream processing application.

3 **REAL-TIME DATA STREAMING WITH APACHE KAFKA**
Understand the producer-consumer architecture of Apache Kafka. Learn to set up a Kafka cluster for managing real-time data.

4 **REAL-TIME DATA PROCESSING USING SPARK STREAMING**
Learn about the real-time data processing architecture of Apache Spark. Build Spark Streaming applications to process data in real-time.

5 **STOCK DATA ANALYSIS ASSIGNMENT (OPTIONAL)**
This assignment revolves around building Spark structured streaming application to processing stock data in real-time.

6 **BUILDING AUTOMATED DATA PIPELINES WITH AIRFLOW**
Automate Data Pipelines with Airflow.

7 **ANALYTICS USING PYSPARK**
Use PySpark to do EDA and Predictive Analysis using Spark's ML library.

8 **CLASSIFICATION ASSIGNMENT (OPTIONAL)**
An assignment related to a classification based problem statement.

9 **PROJECT: REAL TIME DATA PROCESSING**
Build an end-to-end real-time data processing application using Spark Streaming and Kafka.

TOOLS COVERED: APACHE SPARK, APACHE FLINK, APACHE KAFKA, APACHE SPARK STREAMING, APACHE AIRFLOW, APACHE SPARK

CAPSTONE PROJECT

4 ASSIGNMENTS

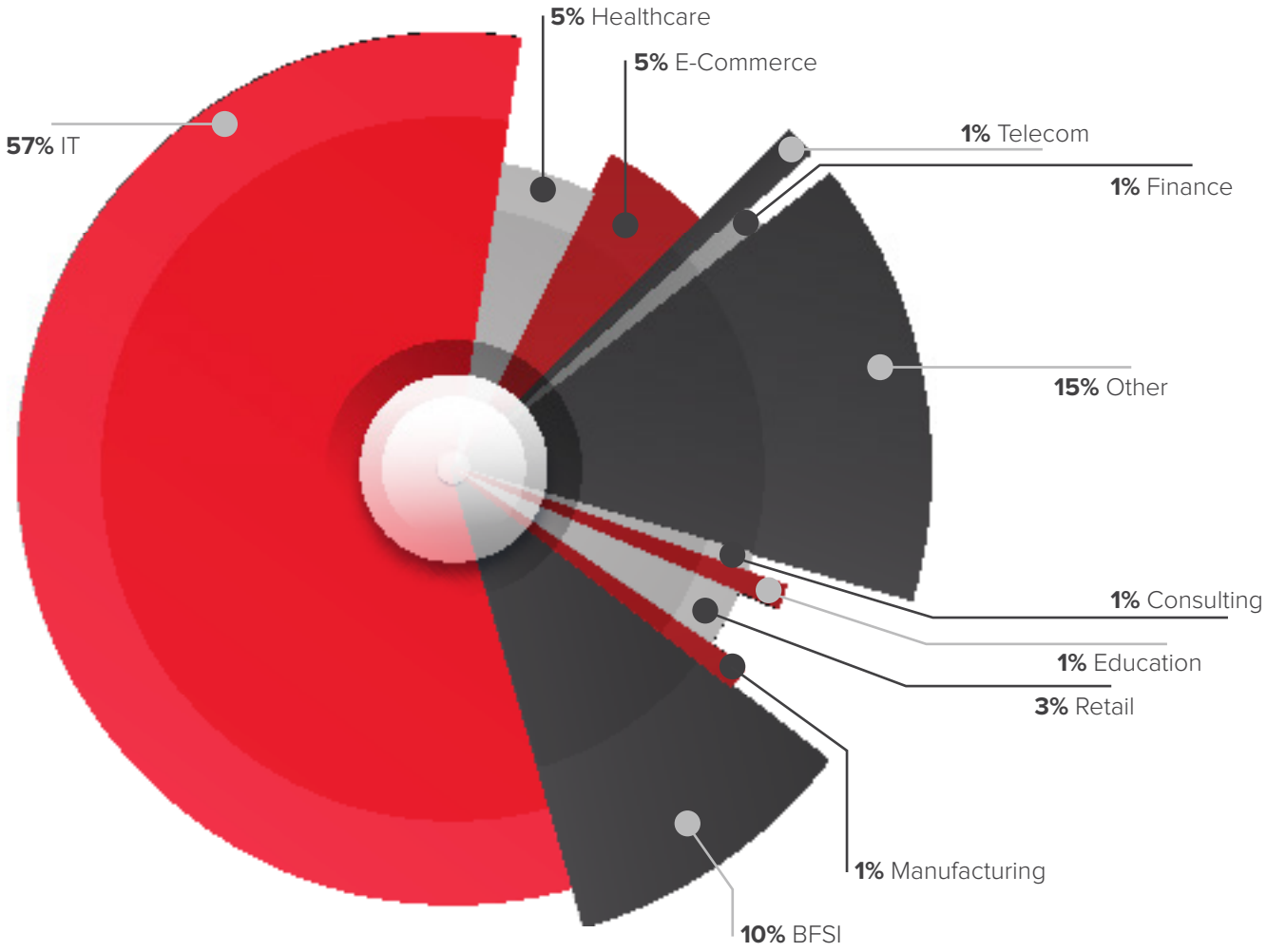
1 **CAPSTONE PROJECT**
The capstone project will stich all the components of data engineering together.

TOOLS COVERED: APACHE SPARK, MYSQL, HIVE, APACHE SQOOP, SPARK STREAMING, APACHE KAFKA, PYTHON

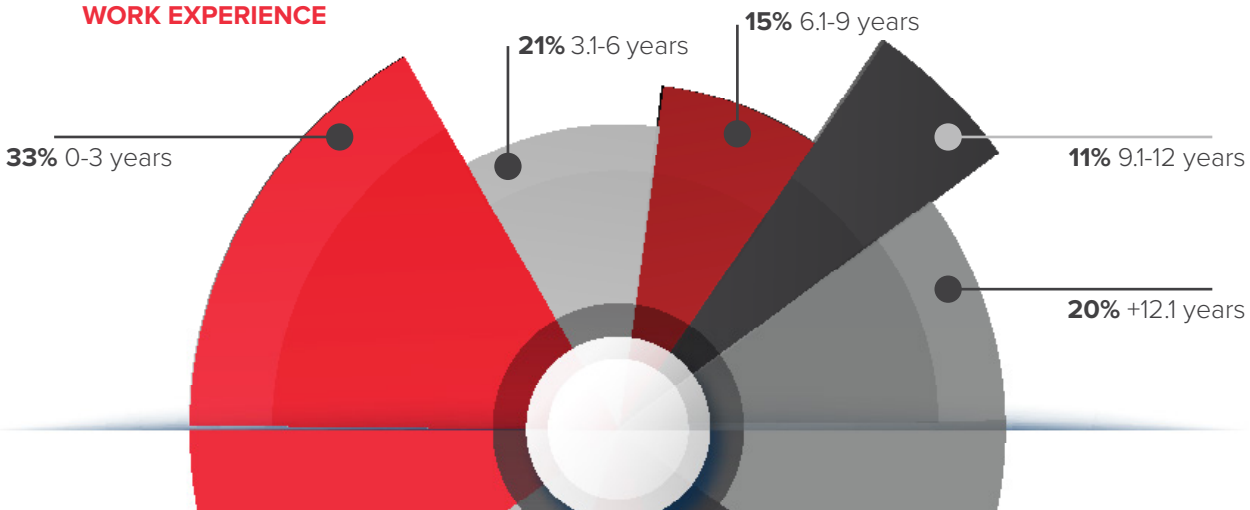
**The Curriculum is subject to change as per the inputs from university or industry experts*

Meet the Class

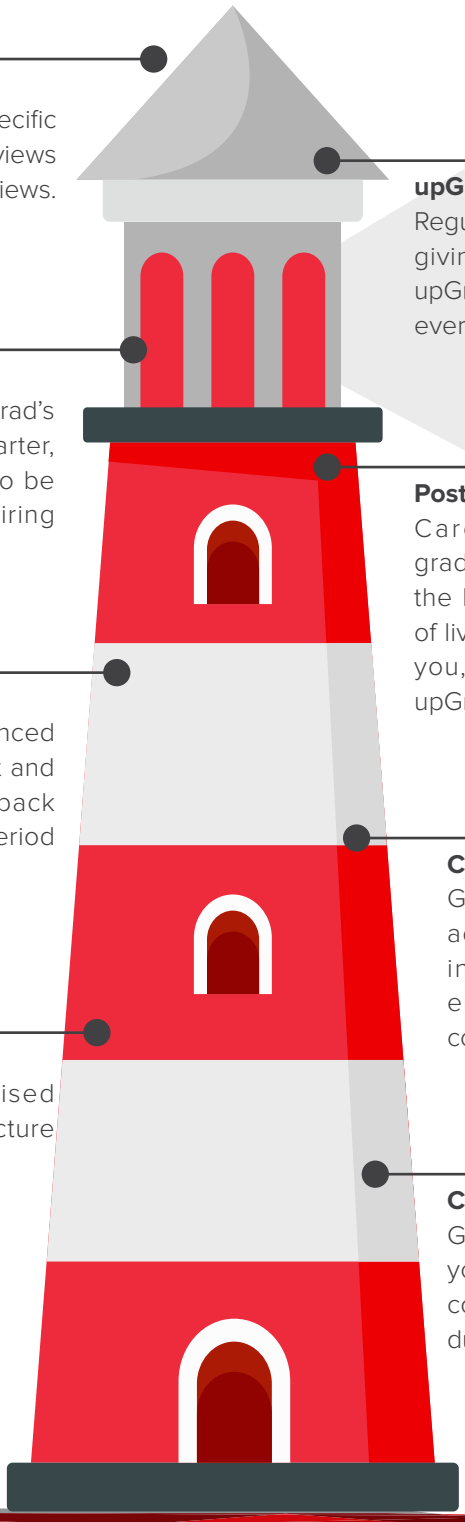
INDUSTRIES OUR STUDENTS COME FROM



WORK EXPERIENCE



Career Support



Just-In-Time Interviews
Get company and role-specific preparation with mock interviews right before your actual interviews.

Job Opportunities Portal
Gain exclusive access to upGrad's 200 job openings each quarter, giving you the opportunity to be interviewed by upGrad's hiring partners.

Personalised Mentorship
Get mentored by an experienced data science industry expert and receive personalised feedback with 4 calls spread over a period of 3 months.

Resume Review
Obtain specific, personalised inputs on your resume structure and content.

upGrad Career Fairs
Regular hiring drives in major cities across India, giving you the opportunity to interview with upGrad's 300+ hiring partners, ensuring you get every opportunity you deserve.

Post Graduation Career Support
Career sessions are continued post graduation because we want you to have all the help you need. These include: 80 hours of live sessions with industry mentors to guide you, dedicated mentorship, and access to upGrad's career assistance resources.

Company-Specific Preparation
Get company-specific guidance with access to a carefully curated pool of interview resources per company to ensure you are interview-ready for the company of your choice.

Career Mentor
Get a dedicated career mentor to help track your weekly company application targets, coach you on your profile, and support you during your career transition journey.

Our Alumni Work at

PROGRAM SUMMARY

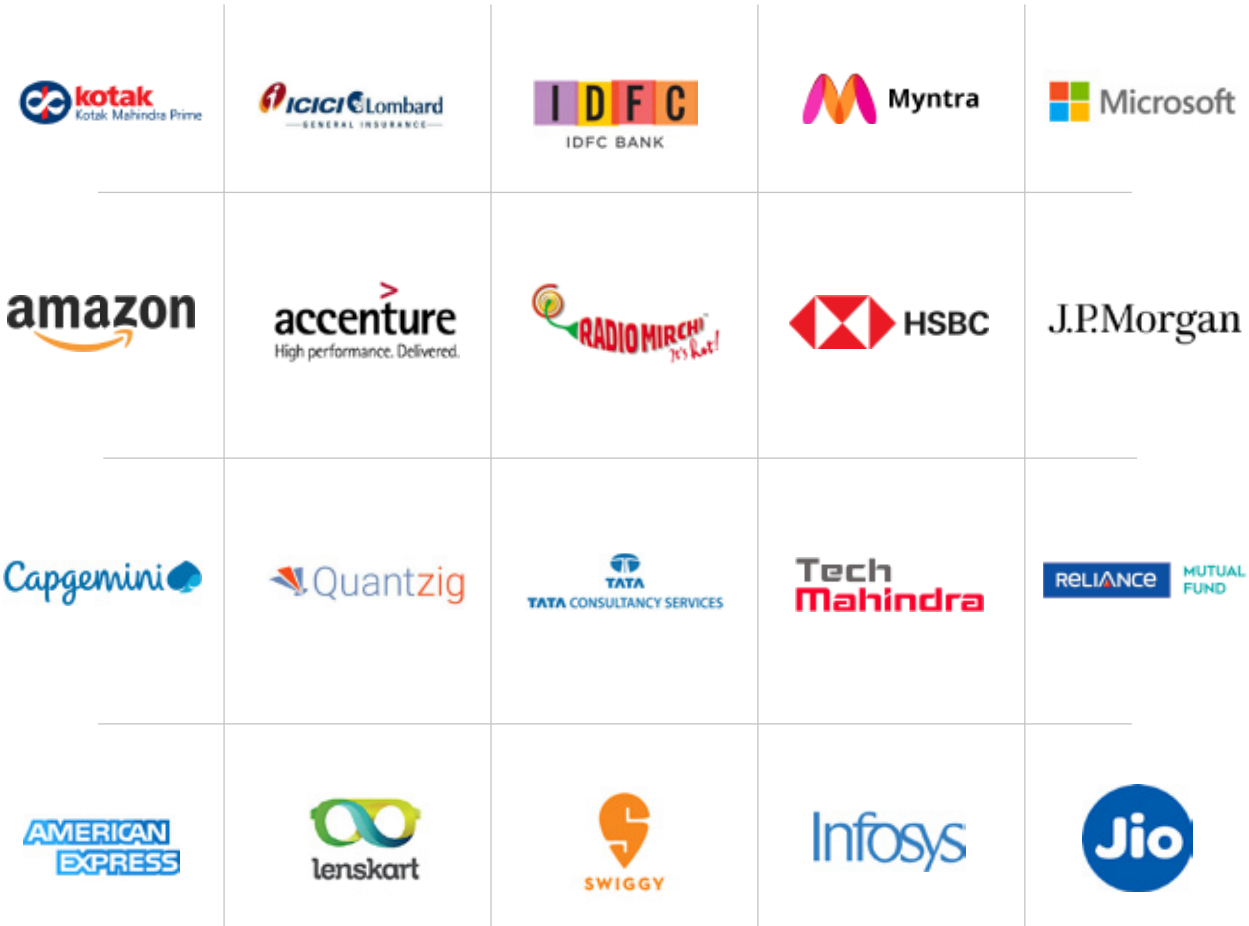
20,000+
Enrolled Learners

INR72 LPA
Highest Salary Hike

400%
Highest Salary Hike

58%
Average Salary Hike

upGrad has a network of over 100 companies who look to recruit graduates from our programs. Some of these well-known companies include:



Career Transitions

Abhishek Singh
MIS Executive (F&B)
Batch: March 2018

↓

Senior Data Analyst, Myntra
(Oct 2019)

Ayush Modi
Associate Consultant (IT)
Batch: March 2018

↓

Marketing Analyst,
Globalization Partners
(July 2019)

Ashish Y
Asst. Manager
(Manufacturing/Production)
Batch: Sept 2018

↓

Business Analyst, Arvind
(Sept 2019)

Jai Krishna
Fresher
Batch: Sept 2018

↓

Business Analyst, Quantzig
(Nov 2019)

Shadab Hussain
Data Scientist (IT)
Batch: Sept 2018

↓

Analyst, TheMathCompany
(July 2019)

Damodar Bandi
Global Supply Chain Analyst
(Software)
Batch: Dec 2018

↓

Sr. Business Analyst, Data
Semantics
(Aug 2019)

Shubhadip B
Technical Project Manager
(Tech Solutions)
Batch: June 2018

↓

Sr. Technical Project Manager,
Aurionpro
(Oct 2019)

Deepshikha
Senior Associate (Tech)
Batch: March 2019

↓

Data Analyst, Amazon
(Nov 2019)

Rohit W
Quality Assurance Tester
(BFSI)
Batch: Jan 2019

↓

Python Automation Engineer,
Credit Suisse
(July 2019)

Hariharan S
AVP (BFSI)
Batch: March 2018

↓

Project Manager, HSBC
(Aug 2019)

Mohit Mamgain
Internship (IT)
Batch: March 2018

↓

Data Analyst, Shine.com (Aug
2019)

Aakash Dusane
Software Engineer (Software)
Batch: Dec 2018

↓

Data Scientist, Quantzig
(Aug 2019)

Sri Harsha Ravi
Principal Data Structure Engineer (IT)
Batch: Sept 2018

↓

Senior Data Scientist, IHS Markit
(Nov 2019)

Sujit Nalawade
Software Engineer (IT)
Batch: Sept 2018

↓

Data Analyst, Xoriant

Sudha Choudhary
Fresher
Batch: June 2018

↓

Internship - AI Engineer, Athancare
(July 2019)

Nishant Chalasany
Project Manager (Agro)
Batch: March 2019

↓

Analytics Operations Lead, Syngenta
(July 2019)

Ganesh Varanasi
Analyst (BFSI)
Batch: March 2018

↓

Data Scientist, Innominds
(July 2019)

Anshul Srivastava
Business Analyst (BFSI)
Batch: Sept 2018

↓

Associate Consultant, Fractal
(Aug 2019)

Anshul Kumar
Analyst (BFSI)
Batch: March 2019

↓

Data Science Intern, Merkle Sokrati
(Aug 2019)

Sylvester Pinto
Senior Software Engineer (IT)
Batch: Dec 2018

↓

Data Associate, J.P. Morgan
(June 2019)

Ansuman Das
Risk Analyst (IT)
Batch: March 2019

↓

Specialist Data Analyst, Novartis
(Aug 2019)

And many more...

Experience upGrad Offline

UPGRAD BASECAMPS

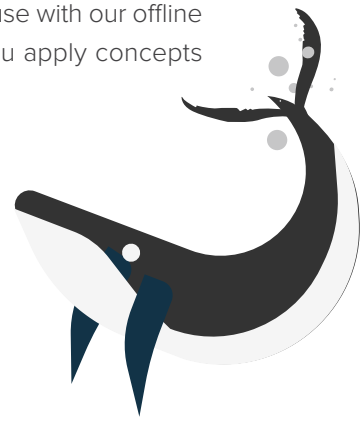
Held across all major cities in India, upGrad basecamps bring together learners, faculty and industry experts for a power-packed day of activities, career building sessions and live group projects. Get to know your peers and faculty, and hone your networking skills in an exciting environment.

CAREER FAIRS

Attend regular hiring drives in major cities across India, giving you the opportunity to interview with upGrad's 300+ hiring partners ensuring you get every opportunity you deserve.

HACKATHONS

Team up and put your learning to use with our offline Hackathons: designed to help you apply concepts and meet, network, and grow!



Hear from
Our Learners

Kunwar Alok, Experience: 15+ Years
"You may not believe it but I had never done coding in my life. I did it during this course and was thrilled to see the outcomes coming out of those codes. Just the way I used to get happy after solving a good (tough) math problem during my school age. Thanks to upGrad for providing a great service to people like us who at the age of 43 can dream to study with budding talents around."

Sachin Aggarwal, Experience: 18+ Years
"Learning with IIITB and upGrad has been an experience like no other. Being an online program, you have your worries about how the program and teaching methods will be. My favourite part about the learning experience has been programming through well designed and thoughtful content shared by IIITB professors and industry experts on upGrad platforms. Kudos to upGrad."

Savita Upadhaya, Experience: 4 Years
"It has been an amazing journey with upGrad till now. Starting with their course material to live sessions to mentor support, each helps you to always be on track and progress efficiently with the Data Science course. My sincere thanks to the entire team of upGrad and Professors of IIITB for showing me the path and direction for my dream to become a Data Analyst."

Sidharth Mahapatra, Experience: 3 Years
"The concepts of R programming and Machine Learning will be taught by Prof. Chandrasekhar Ramanathan and Prof. G Srinivasaraghavan respectively. Both of them have been listed in the list of the top twenty most prominent Data Science academics published by Analytics India Magazine. So you need not worry about quality of teaching in this program."

Tuhin Pal, Experience: 5 Years

"I appreciate the platform upGrad has provided and how they have arranged modules and assignments. Modules are locked until you complete the previous one, so it feels like clearing a semester and going to the next one."

Harkirat Dhillon, Experience: 8 Years

"A dedicated studying regime is the key to be successful and pass the program. This program will help build a strong foundation for a successful transition into Data Science. Additionally, participating in Hackathons and Kaggle competitions to solve real-world problems will definitely give you an edge and land a job if one is willing to work hard."

Shravani Shahapure, Experience: 16 Years

"For someone who really wants to pursue a career in the field of Data Science, it is worth opting for the complete course by IIITB and upGrad. IIITB and upGrad's online program on Data Science gives many opportunities and develops students for their future as they provide the best professors, thought-provoking assignments and case studies."

Sagar Tekwani, Experience: 2 Years

"A very well-structured and well-balanced program content which you won't get in other programs/nano-degrees. Being a beginner in DS, I found the structure of the Executive PG Programme from IIITB and upGrad most helpful. They even teach you most of the prerequisites with prep sessions before you even start the course. Being a working professional, it was neither too difficult nor too easy to keep up with the pace of the course."

Program Details and Admission Process

PROGRAM DURATION AND FORMAT
12 Months | Online

PROGRAM FEE
INR 2,99,000 (Incl. of all taxes.)

PROGRAM START DATES
Please refer to the website for program start dates.
www.upgrad.com/data-science-pgd-iiitb/

ELIGIBILITY
Bachelor's Degree with 50% or equivalent passing marks. No coding experience required.

WEEKLY COMMITMENT (12-15 hours/week)

6-7 HOURS
Asynchronous learning time.

6-7 HOURS
Assignments and projects.

1 LIVE SESSION
Every two weeks.

SELECTION PROCESS

STEP 1: Selection Test
Fill out an application and take a short 17-minute online test with 11 questions.

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

PRIYANKA PRAJAPATI
Program Marketing Manager, Data Programs
admissions@upgrad.com
1800 210 2020