



International
Institute of Information
Technology Bangalore

powered by

upGrad

Executive Diploma in

Data Science & AI

Infused with GenAI



Largest DS & AI program in India

with 9+ Years of Legacy &
30,000+ Learners





About IIITB

The International Institute of Information Technology Bangalore (IIITB)

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

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

Ranked 74th in the Engineering category of the National Institutional Ranking Framework (NIRF) in 2022, IIITB continues to excel in education and research, making it a preferred destination for aspiring technologists and future leaders.



AICTE



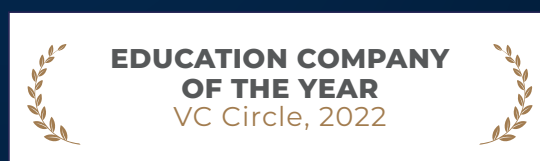
UGC

ABOUT upGrad

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



Ronnie Screwvala
Co-founder & Executive Chairman



Current Industry Trends

14.4 LPA

Average salary
for Data Scientists
in India (2024)

Source: AmbitionBox

57.5%

CAGR of Indian
Data Science market
till 2028

Source: Milleniumpost

50%

Increase in search
volume for 'Data Science'
since 2020

Source: Exploding Topics

36%

Increase in growth of
Data Science jobs
by 2031

Source: Harvard Extension School

\$378.7B

Size of global
Data Science market
by 2030

Source: Milleniumpost

Program Highlights

Here are the **top reasons** why you should consider this program



Hands-On Learning

Gain Practical Experience by building AI Apps



Popular Tools

Master 30+ In-Demand DS & AI tools



Python Bootcamp

Complimentary Python Programming Bootcamp for Beginners



Specialisations

Choose from 5 Core Data Science Specialisations

Industry Hiring Partners



Program Impact Success Stories

Before upGrad

Ujwala Potharlanka
System Engineer



After upGrad

Jiva
Data Analyst

Before upGrad

Sandhyarani Sahoo
Business Associate



After upGrad

DELTA
Associate Consultant

Before upGrad

SaiGoutam Kolluru
Optimisation Specialist



After upGrad

TCS
Enterprise Architect

Before upGrad

Aditya Verma
Operation Executive



After upGrad

KANSAL NEROLAC
PAINTS LIMITED
Data Analyst

Before upGrad

Abhaya Pratap Singh
Associate Consultant



After upGrad

IBM
Big Data Engineer

Sandeep Varma

- Assistant Manager
- Assistant Manager Business Analyst (HSBC)

Govind

- Consultant
- Senior Associate Consultant (INFOSYS)

Vandana Maurya

- Database Tech Lead
- SQL Server Database Administration (Citius Tech Pvt Ltd)

Joseph Jerrey

- Development Engineer
- Quality Leader (IKEA of Sweden AB)

Souvik Mitra

- Data Analyst
- Business Analyst (Xiaomi)

Deepak Baliya

- Software Engineer
- Sr Software Engineer (Oak North)

Rohit Ambasta

- Data Analyst, Vendor BI (contractual position)
- Senior Data Analyst (GE Renewable Energy)

Prateek Aneja

- Software Engineer
- Machine Learning Consultant (Tardid Technologies)

Program Completion Certificate



Earn valuable credentials with an Executive Diploma in Data Science and Artificial Intelligence-equivalent to a 1-year PG Diploma and accredited with NAAC A+ (2021). Join India's largest DS & AI alumni network of over 10,000 professionals.

Faculty



Dr. Debabrata Das

Director of IIITB



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



Prof. Chandrashekar Ramanathan

Dean Academics, IIITB



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

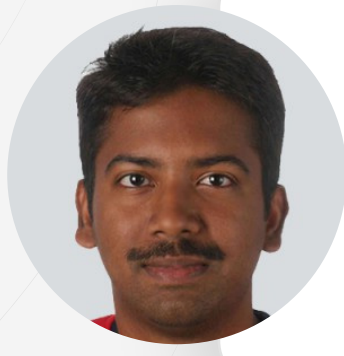


Prof. G. Srinivasaraghavan

Professor, IIITB



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



Dr. Dinesh Babu Jayagopi

Professor, IIITB



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



Chandrashekar Ramanathan

Professor & Dean (Academics)



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



Tricha Anjali

Ex-Associate Dean



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

Industry Experts



Mirza Rahim Baig

Startup Mentor



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



Team Lead - Product Analysis



Marketing Analytics Visiting Professor



Ex-Analytics Lead



Anand

CEO



A Straive Company

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



Faculty



Principal

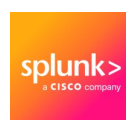


Ex-Consultant



Abhishek Vijayvargia

Senior Data Scientist



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

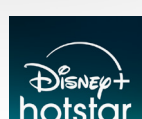


Ex-Senior Data Scientist



Sajan Kedia

Sr. Engineering manager



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



Sr. Engineering manager



Machine Learning Engineer



Machine Learning Research Engineer



Rajesh Sabapathy

CEO

Sr. Data Scientist, Healthcare sector

AI/ML leader, fortune 5 Healthcare Giant. Has driven innovation in healthcare using deep learning and big data. With expertise in Python, R, and cloud platforms.



Business Intelligence Unit (ICICI)

More than 30+ In-Demand Industry Tools and Technologies

Python for Data Science



Basic Data Analytics



Machine Learning



Deep Learning



Data Engineering & Big Data Analytics



GenAI



Your Program Journey

Phase I

Phase II

Phase III



Core Curriculum

(25 weeks, 15 credits)

Capstone

(4 weeks, 7 credits)

Specialisation Tracks

(25 weeks, 14 credits)

Data Analysis

Data Engineering

Business Analysis

Deep Learning

Natural Language Processing



Core Curriculum

The core phase of the curriculum will equip you with the basic tools and concepts for data science.

Topics

- ▶ **Python Programming for Data Science**
- ▶ **Exploratory Data Analysis**
- ▶ **Inferential Statistics and Hypothesis Testing**
- ▶ **Introduction to Database Management Systems and SQL Programming**
- ▶ **Machine Learning, Linear and Logistic Regression, Clustering Techniques**
- ▶ **Basics of Natural Language Processing**
- ▶ **Version Control with Git and GitHub**

Projects

- ▶ **Credit Risk Analysis**
Analyse loan application data using exploratory data analysis to identify factors influencing loan default risk.
- ▶ **Movie Ratings Analysis**
Analyse movie ratings data using MySQL to provide insights and recommendations for an upcoming global project.
- ▶ **Bike Sharing Demand Prediction**
Build a regression model to predict the demand for shared bikes to help understand supply, meet demand, and plan logistics.
- ▶ **Lead Scoring Classification**
Build a logistic regression model to assign lead scores and identify potential leads to improve lead conversion rates.

Note: You may also opt for a complimentary live programming bootcamp in the early stage of the common phase to sharpen your programming skills in preparation for the main journey ahead.

Data Analysis Specialisation

DA

The data analysis (DA) specialisation of the curriculum will focus on essential skills and concepts required for data analysts such as advanced data modelling, distributed data processing, and advanced storytelling and dashboarding techniques.

Topics

- ▶ Big Data Analytics with PySpark
- ▶ Advanced Database Programming using SQL and pandas
- ▶ Data Storytelling with Tableau and Power BI
- ▶ Analytical Thinking and Structured Problem Solving
- ▶ Data Structures and Algorithms
- ▶ Algorithm Analysis and Recursion

Projects

- ▶ **Recipe Recommender EDA**
Analyze recipe data and perform exploratory data analysis and feature extraction to design a recommender system to recommend recipes to users based on their choice and the current recipe they are looking at.

- ▶ **Rental Properties Analysis and Dashboarding**
Perform data analysis on rental property listings in a city to develop actionable recommendations to significantly increase the company's revenue.

Note: You will also develop and implement solutions to various advanced programming problem statements in this specialisation.

Data Engineering Specialisation

DE

The data engineering (DE) specialisation of the curriculum will focus on essential skills, concepts, and technologies used by data engineers around the world for data handling, data migration, data warehousing, real-time data processing, and data pipeline automation.

Topics

- ▶ Cloud Computing using AWS
- ▶ Big Data Processing using Hadoop and MapReduce
- ▶ NoSQL Databases and Apache HBase
- ▶ Data Ingestion using Sqoop and Flume
- ▶ Big Data Analytics using Apache Spark
- ▶ Data Warehousing using Amazon Redshift
- ▶ Real-time Data Streaming using Apache Kafka and Spark Streaming
- ▶ Building Automated Data Pipelines using Apache Airflow

Projects

- ▶ **Taxi Rides Analysis**
Perform analysis of the dataset encompassing taxi trip information in a city and leverage a combination of big data tools and cloud services on an AWS EMR cluster to unlock valuable insights from this data.

- ▶ **ATM Transactions Data Analysis**
Develop a batch ETL pipeline and perform analytical queries to understand ATM usage patterns and optimise refill frequencies.

- ▶ **Real-time Retail Data Analysis**
Develop a data pipeline that ingests sales data from Kafka, cleans and transforms it, calculates KPIs, and stores them in JSON files for further analysis.

Note: You will focus more on tools and technologies for data engineering in this specialisation.

Business Analysis Specialisation

BA

The business analysis (BA) specialisation of the curriculum will focus on popular tools and concepts that are used in the industry for extracting rich and relevant insights from various kinds of business data with the goal of improving the overall business.

Topics

- ▶ Advanced Machine Learning Models and Model Selection
- ▶ Time Series Forecasting
- ▶ Data Storytelling with Tableau and PowerBI
- ▶ Analytical Thinking and Structured Problem Solving
- ▶ Operations Research using Excel
- ▶ LLM System Design, ChatBot Development, AI Development Frameworks
- ▶ Retrieval Augmented Generation

Projects

- ▶ **Business Case Study with 3 Options to Choose from**
 - Telecom customer churn prediction - Analyze customer-level data from a leading telecom firm, and build predictive models to identify high-risk churn customers and pinpoint the primary indicators of churn.
 - BFSI case study - Predict default risk of customers and build an end-to-end model for performing credit risk analysis for banks.
 - Ecommerce and retail case study - Create ML models to better understand the customer payment behaviour based on their past payment patterns using customer segmentation techniques. Using historical information, Predict the likelihood of delayed payment against open invoices from customers using historical information. Identify important predictor attributes that will help the business understand indicators of late payment.

- ▶ **Rental Properties Analysis and Dashboarding**
Perform data analysis on rental property listings in a city to develop actionable recommendations to significantly increase the company's revenue.

- ▶ **Insurance Data Information Retrieval**
Create GenAI system to retrieve information regarding specific policies from a knowledge bank containing insurance documents.

Note: This specialisation track contains dedicated courses on generative AI (GenAI) which are relevant to business analysis applications in the industry. You are expected to bear the cost of up to \$40 depending on your usage of GenAI tools in this specialisation.

Deep Learning Specialisation

DL

The deep learning (DL) specialisation of the curriculum will focus on the fundamentals of deep learning and artificial neural networks with greater emphasis on applications such as computer vision, large language models and generative AI.

Topics

- ▶ Advanced Machine Learning Models and Model Selection
- ▶ Introduction to Deep Learning and Artificial Neural Networks
- ▶ Convolutional Neural Networks Architectures
- ▶ Deep Learning Applications for Computer Vision
- ▶ Attention Mechanisms and Transformer Architectures
- ▶ LLM System Design, ChatBot Development, LLM Development Frameworks
- ▶ Retrieval Augmented Generation, Image Generation AI Models

Projects

- ▶ **Telecom Customer Churn Prediction**
Analyze customer-level data from a leading telecom firm, and build predictive models to identify high-risk churn customers and pinpoint the primary indicators of churn.

- ▶ **Hand Gesture Recognition**
Design and train a machine learning model capable of accurately recognizing five distinct user gestures, corresponding to specific commands, captured by a webcam mounted on the TV.

- ▶ **Insurance Data Information Retrieval**
Create GenAI system to retrieve information regarding specific policies from a knowledge bank containing insurance documents.

Note: This specialisation track contains dedicated courses on generative AI (GenAI) which are relevant to business analysis applications in the industry. You are expected to bear the cost of up to \$40 depending on your usage of GenAI tools in this specialisation.

Natural Language Processing Specialisation

NLP

The natural language processing (NLP) specialisation of the curriculum will focus on core concepts, skills, and technologies for natural language processing, engineering, and analytics, such as classical NLP techniques and modern NLP with deep learning, large language models, and generative AI models.

Topics

- ▶ Advanced Machine Learning Models and Model Selection
- ▶ Syntactic and Semantic Processing
- ▶ Deep Learning Applications for Natural Language Processing
- ▶ Attention Mechanisms and Transformer Architectures
- ▶ LLM System Design, ChatBot Development, AI Development Frameworks
- ▶ Retrieval Augmented Generation

Projects

- ▶ **Telecom Customer Churn Prediction**
Analyze customer-level data from a leading telecom firm, and build predictive models to identify high-risk churn customers and pinpoint the primary indicators of churn.

- ▶ **Automatic Ticket Classification**
Develop a system to automate the classification of customer complaints based on the products or services mentioned to enable faster issue resolution, improved customer satisfaction, and the ability to identify areas for service improvement.

- ▶ **Insurance Data Information Retrieval**
Create GenAI system to retrieve information regarding specific policies from a knowledge bank containing insurance documents.

Note: This specialisation track contains dedicated courses on generative AI (GenAI) which are relevant to business analysis applications in the industry. You are expected to bear the cost of up to \$40 depending on your usage of GenAI tools in this specialisation.

Capstone Project Choices

Choose from 15+ industry-relevant domain-based capstone projects that are relevant to your specialisation:



Credit Card Fraud Detection

- Build a credit card fraud detection model using historical transaction data, perform EDA, split data, handle class imbalance, and tune hyperparameters.
- Evaluate model using precision, recall, and cost-benefit analysis, balancing fraud loss reduction with new authentication costs.

DA DE BA DL NLP



Stocks, Finance, and Risk Analytics

- Optimise a stock portfolio using technical analysis, the Sharpe ratio, and machine learning to predict and assess performance across sectors.
- Compare portfolio performance against the S&P 500 and summarise results with visualisations for clear insights.

DA BA



Marketing and Retail Analytics

- Optimise product category management using the Pareto principle, identifying key product combinations to enhance assortment strategy, sales, and customer satisfaction.
- Perform data cleaning, market basket analysis, visualise insights, and create a dashboard and executive presentation to guide decisions.

DA



Supply Chain Analytics

- Clean and analyse the dataset to track inventory and operations, focusing on digger-crusher activity.
- Develop a live monitoring system using Tableau or Power BI dashboards and present findings via PowerPoint, enhancing operational visibility and efficiency at the mine.

DA



Web and Social Media Analytics

- Preprocess Amazon review data, perform text analytics, and build a sentiment classification model to understand consumer preferences and the competitive landscape.
- Visualise insights using a Tableau dashboard, helping the manufacturer refine product features and tailor marketing strategies to increase market share and brand value.

DA



Cab Rides Data Capture

- Build a data analytics infrastructure using Kafka for real-time clickstream ingestion, Hadoop and Hive for storage and querying, and Spark for data processing.
- Enable quick, on-demand insights for strategic decisions, improving customer experience with zero downtime.

DE



Instant Health Alert Systems

- Build a healthcare monitoring system with IoT devices, integrating Sqoop, Spark, Kafka, Hive, and HBase to process real-time patient data like temperature and blood pressure.
- Simulate and store IoT data, compare it with reference values, and trigger real-time alerts through a consumer app when anomalies are detected.

DE



Online Advertising Platforms

- Design an online advertising platform for campaign management, real-time ad auctions, user interaction tracking, and feedback processing using Kafka, MySQL, Hadoop, Hive, and Spark.
- Simulate ad serving, manage auctions, process real-time feedback, and generate analytics reports, leveraging datasets like Amazon advertisement, ADS 16, and advertising data to optimise ad strategies.

DE



Healthcare Analytics

- Use mind mapping tools to develop an issue tree, identifying root causes of stagnating CMS ratings and a declining customer base, followed by building a predictive model to improve ratings.
- Perform data preparation, model building, and evaluation, then present findings and actionable recommendations via a PowerPoint and brief video to drive profitability and better service delivery.

BA



Computer Vision Modelling

- Create a deep learning model using a CNN-RNN architecture with an attention mechanism to generate dynamic captions for images, aimed at assisting visually impaired individuals.
- Train the model to provide verbal descriptions of image content, leveraging advanced machine learning techniques to enhance accessibility for blind users.

DL



Sales Forecasting

- Build a sales forecasting model using historical sales data, incorporating variables like promotions, competition, and seasonal effects to predict daily sales for the next six weeks.
- Analyse data stationarity and cointegration, and use statistical models like vector autoregression to enhance forecast accuracy, providing actionable insights for optimising store operations.

DL NLP



Healthcare Image Modelling

- Develop a system using a generative adversarial network (GAN) to generate artificial MRI images at different contrast levels, facilitating the translation between T1 and T2 weighted scans.
- Aim to improve diagnostic accuracy by providing various imaging perspectives from a single scan, ultimately creating a tool for producing realistic, high-contrast MRI images to assist in medical diagnosis.

DL



News Recommendation

- Create a recommendation system for a media organisation that personalises content delivery by recommending the top 10 new articles to users daily and suggesting 10 similar articles based on user clicks.
- Use user interaction data to build predictive models for user preferences, evaluating performance with metrics like RMSE, MAE, and precision to ensure recommendation relevance and accuracy.

NLP



Product Recommendation

- Build a product recommendation system that incorporates sentiment analysis to enhance suggestions based on user preferences, experimenting with various machine learning models for text classification to determine the best approach for sentiment analysis.
- Select either a user-based or item-based recommendation strategy, ensuring the final system delivers dynamic, tailored product recommendations that improve with user feedback, and deploy it using Flask for real-world application.

NLP

Rich and Dedicated **Live Support**

Industry Expert Sessions

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



IIITB Faculty Sessions

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



Personalised Industry Sessions

Participate in focussed sessions within a limited audience group as industry experts dive deeper into the industrial and business-related aspects of various advanced topics and technologies.



Career Mentorship Sessions

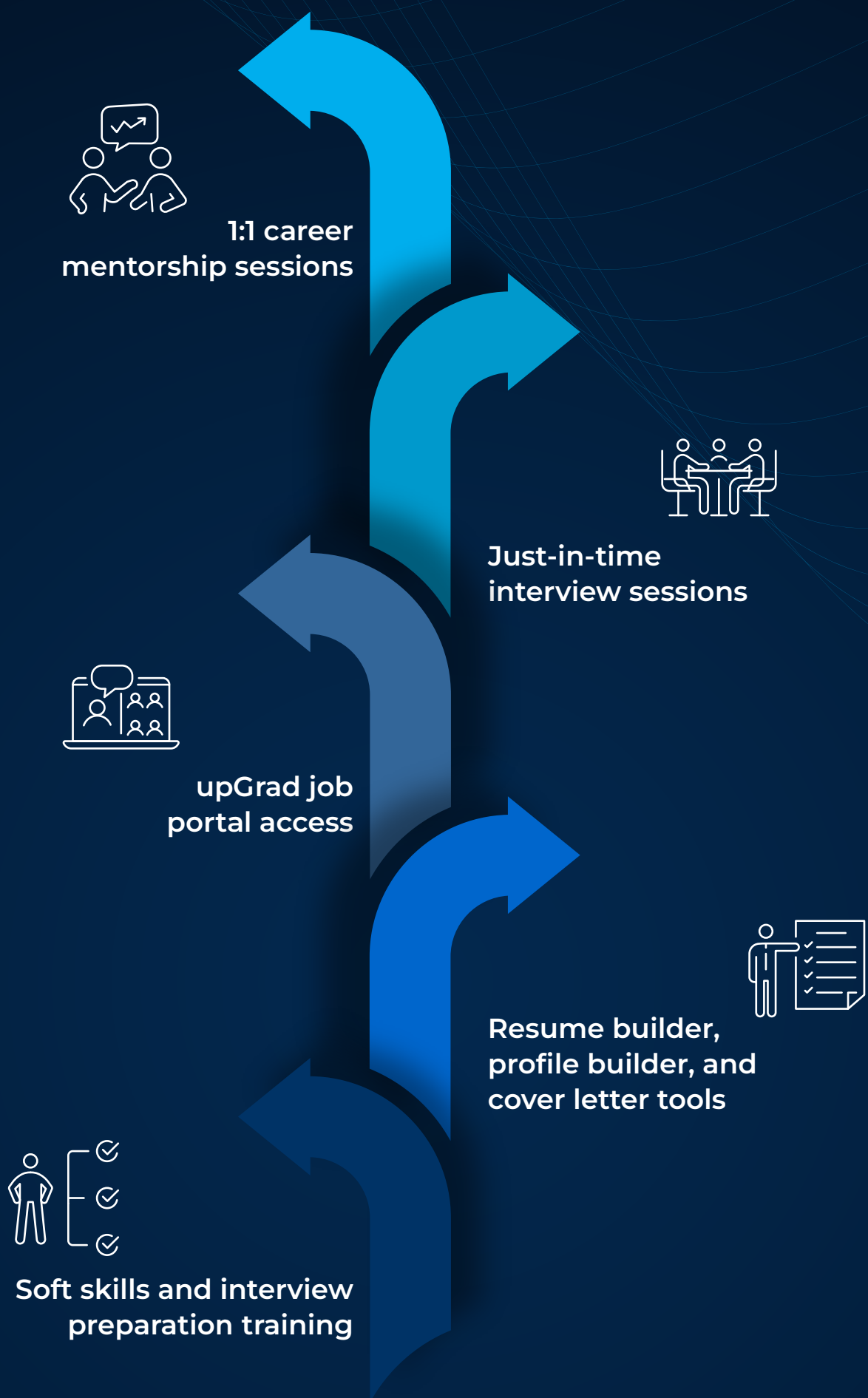
Engage in personalised career mentorship connects with industry experts as they guide you on the best practices for your career future and even help you be better prepared via mock interviews.



Doubt Resolution Sessions

Join doubt resolution session slots and have an expert available to resolve your queries for a smooth learning journey.

Effective Career Support



Student Support

Telegram channel for learner communications

Cohort Telegram channel for instant doubt resolution and timely program updates and announcements.

Non-academic and non-technical query assistance

Get help with any non-academic or non-technical queries and updates through buddy sessions.

Completion Support

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

Personalised support

Personalised assistance tailored to individual learner requirements.

Financial benefits

Access benefits like eferalls and repeats by sharing details with your upGrad buddy.



Option to articulate to a Master's degree
from Liverpool John Moores University after
successful completion of the program

LJMU



Enrol in 4 small steps, Then take a giant leap.



Eligibility Criteria:

Bachelors or Master's Degree or its equivalent in any discipline with minimum 50% aggregate mark or equivalent CGPA.



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www.upgrad.com



Call: 1800-210-2020

upGrad

LET'S TALK

