



भारतीय प्रबंध संस्थान कोषिककोड

Indian Institute of Management Kozhikode

*Globalizing Indian Thought*

# PROFESSIONAL CERTIFICATE PROGRAMME IN ADVANCED DATA ANALYTICS FOR MANAGERS

STARTS SEPTEMBER 30, 2023 | 10 MONTHS | LIVE ONLINE SESSIONS

**BATCH 7**



# IIM Kozhikode Advantage

*From the Director's Desk...*

Businesses today have seen a complete transition than they used to run a decade ago. IIM Kozhikode programmes designed by world-class faculty with their cutting-edge thought leadership and industry-leading insights empower participants to manage and lead complex business challenges with confidence and informed decision-making ability. Our growing global footprints acknowledged and accredited by leading institutions of the world are a testimony to growth we have achieved in our 27-year journey of academic excellence.

At this juncture, it is also pertinent to share that both future and past are integral to the path taken by an institution on this journey of excellence. Having a wide, far-seeing vision is not an indulgence but an activity that is necessary to give meaning to our present, to give this Institution a sense of purpose, direction and imagination. That is why we have chosen to think in terms of what IIM Kozhikode will be able to contribute to India and the world some three decades from now with 'Vision 2047: Globalizing Indian Thought'. The sheer scale, scope and potential impact that India will have on 21st century business makes us believe that this is a legitimate aspiration.

Data is one of the most important commodities in the world today and the knowledge of how to analyse, extrapolate and segregate it is of paramount importance across industries. The right use of data can help propel your organisation and career to new heights, to make the most of this commodity, the Indian Institute of Kozhikode has launched the Advanced Data Analytics for Managers programme. This programme will empower Team Leads, Managers and Business Head to elicit the most out of data through topics such as Data Visualisation, Statistical Inferences, Basics of Modelling, Text Mining & Social Media Analysis among others. This programme curriculum is designed around the importance of being industry-ready in a data-driven future.

Wishing you all the very best!

*Debashis Chatterjee*

**Prof. Debashis Chatterjee,**  
Director IIM Kozhikode



# Overview

## Starts On

September 30, 2023\*

## Duration

10 Months

## Format

Live Online Sessions

## Programme Fee

INR 1,81,500 + GST

*\*Begins with an introduction to the platform*

In today's data-driven business landscape, the ability to effectively analyze and interpret vast amounts of information is a critical skill for managers. Advanced data analytics empowers managers to gain valuable insights, make informed decisions, and drive organizational success.

IIM Kozhikode's Professional Certificate Programme in Advanced Data Analytics for Managers is a guidepost to spur your understanding of analytics. Advanced data analytics refers to the application of sophisticated techniques, algorithms, and tools to extract meaningful patterns, trends, and insights from large and complex datasets. It encompasses various analytical approaches, including statistical analysis, machine learning, predictive modeling, data mining, and data visualization.

This programme's focus on real-world examples, case studies, and practical sessions will ensure that you build a strong foundation in business analytics and make high-output business decisions.



Organizations that personalize customer experiences through data-driven approaches achieve 5-8 times higher ROI on marketing spend and 10-30% revenue growth

**(source: McKinsey)**



Companies that use advanced data analytics for fraud detection achieve 50% higher savings compared to those relying on traditional methods

**(source: PWC)**

# Who is this Programme for?

- This programme is best suited for mid to senior-level professionals seeking to gain cutting-edge analytical skills to establish a career in Business data Analytics and Data Science.
- Professionals looking to develop a data-driven decisionmaking approach and the ability to leverage analytics for business growth and scale will also benefit from the programme.

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**Data reveals impact, and with data,  
you can bring more science to your decisions.**

- Matt Trifiro, CMO, Vapor IO

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# Programme Highlights

IIM Kozhikode's Professional Certificate Programme equips participants with a comprehensive understanding of advanced data science tools so that they can effectively manage and lead high-performing data science and analytics teams.



Develop a data-driven mindset to manage, visualise and analyse data effectively

Hands-on exercises using real-world data sets & practical sessions



Immersive learning journey with real-world case studies, business decision-related projects & Capstone Project

Taught by eminent IIM Kozhikode faculty, Emeritus global faculty & renowned industry experts



Certificate of Completion from IIM Kozhikode, one of India's Leading B-Schools

Receive Lifelong Executive Alumni Status & Networking Opportunities



## Note:

-The primary mode of learning for this programme is via live online sessions with faculty members. Post session video recordings may or may not be made available, at the discretion of faculty members. Post session video recordings will be made available, at the discretion of faculty members.

-The programme highlights presented above are approximate, and subject to change depending on the availability and expertise of the teaching faculty, as well as the program's desired outcomes.

## Tools



## Note:

- R will be the primary tool for Data Science
- Tableau will be the primary tool for Data Visualisation

# Programme Director



## Prof. Sreejesh S, PhD

*Programme Director & Associate Professor,  
Marketing Management*

Professor Sreejesh's primary research interests include marketing analytics, brand management, services marketing, and online marketing & advertising. His publications have appeared in Journal of Brand Management, Industrial Marketing Management, European Journal of Marketing, Computers in Human Behaviour, Journal of Travel and Tourism Marketing, International Journal of Contemporary Hospitality Management, Internet Research, Journal of Product and Brand Management, Journal of Service Theory and Practice, International Journal of Bank Marketing, etc. He serves on the editorial board of International Journal of Consumer Studies. He has also authored books of international repute with Pearson India and Springer International. Prof. Sreejesh S is currently working as an Assistant Professor of Marketing Management at IIM Kozhikode.

*Note: Programme Directors might change due to unavoidable circumstances, and revised details will be provided closer to programme start date.*

## Programme Directors' Message



The Professional Certificate Programme in Advanced Data Analytics for Managers will equip professionals to have practical and interlocking competencies that maximise the best use of data and interpret the insights generated from the data, which will drive them to have better business decisions in their day-to-day business scenario. Moreover, the machine learning focus of the programme using powerful data analytics platforms will develop industry-ready professionals with in-depth expertise in extracting meaningful insights from the complex data.



# Programme Modules

## MODULE 1: INTRODUCTION TO DATA ANALYTICS & R

- Introduction R environment
- IDE-R studio
- Installing packages
- Loading packages in R
- Creating variables
- Scalars, vectors & matrices
- List, data frames & data types
- Converting between vector types
- Cbind & Rbind
- Attach and detach functions
- Reading .csv and .txt files
- Importing data from excel
- Loading and storing data with a clipboard
- Saving in R data, loading R data objects
- Writing data into the file
- Writing text and output from analyses to file
- Rmarkdown

## MODULE 3: DATA VISUALISATION

- Basics of data visualisation using ggplot2
- Aesthetic mappings
- Common problems
- Facets
- Geometric objects
- Position adjustments
- Coordinate systems
- The layered grammar of graphics
- Combining plots
- Execution of various types of plots (box plot, histogram, pie chart, line chart, scatterplot, word cloud, probability plots, mosaic plots, correlograms, and interactive graphs)

## MODULE 2: UNDERSTANDING DATA STRUCTURE

- Data subsets
- Selecting rows/observations
- Rounding a number
- Creating a string from variable
- Factor labels
- Selecting columns/fields
- Merging data
- Relabelling the column names
- Data sorting, data aggregation, and finding and removing duplicate records
- Application of dplyr package (select, arrange, mutate, aggregate, summarise, and group)

## MODULE 4: PRE-PROCESS THE DATA

- Data cleaning
- Handling missing data
- Data imputation
- Feature filtering
- Categorical feature filtering
- Identifying misclassifications
- Data transformation
- Min-max normalisation
- Z-score
- Standardisation
- Decimal scaling
- Transformations to achieve normality
- Outliers
- Graphical methods for identifying outliers
- Numerical methods for identifying outliers
- Flag variables
- Transforming categorical variables into numerical variables
- Binning numerical variables reclassifying categorical variables
- Adding an index field
- Removing variables that are not useful
- Data balancing techniques

# Programme Modules

## MODULE 5: EXPLORATORY DATA ANALYSIS

- Hypothesis testing versus exploratory data analysis
- Getting to know the data set
- Exploring categorical variables
- Exploring numeric variables
- Exploring multivariate relationships
- Selecting interesting subsets of the data for further investigation
- Using EDA to uncover anomalous fields
- Binning based on predictive value
- Deriving new variables: flag variables
- Deriving new variables: numerical variables
- Using EDA to investigate correlated predictor variables
- Need for dimension-reduction in data mining
- Principal components analysis (PCA)
- Application of PCA

## MODULE 6: STATISTICAL INFERENCES

- Statistical inference
- Confidence interval estimation of the mean
- The margin of error
- Confidence interval estimation of the proportion
- Hypothesis testing for the mean
- Assessing the strength of evidence against the null hypothesis
- Using confidence intervals to perform hypothesis tests
- One-sample t-test
- Paired sample t-test
- Chi-square test for goodness of fit of multinomial data
- Analysis of variance (ANOVA)

## MODULE 7: BASICS OF MODELLING

- Supervised versus unsupervised methods
- Statistical methodology and data mining methodology
- Cross-validation
- Overfitting
- Bias-variance trade-off
- Balancing the training data set
- Establishing baseline performance
- Simple regression analysis
- Model formulation
- Verifying the regression assumptions
- Inference in regression
- Multiple regression analysis
- Dummy variable
- Stepwise regression analyses

## MODULE 8: CLASSIFICATION

- k-nearest neighbour algorithm
- Decision tree
- Random forest
- Neural networks for estimation and prediction
- Application of logistic regression for estimation and prediction
- Naïve bayes and Bayesian networks

# Programme Modules

## MODULE 9: CLUSTERING

- Hierarchical Clustering
- Methods k-Means Clustering
- Measuring Cluster Goodness
- Affinity Analysis
- Market Basket Analysis

## MODULE 10: TEXT MINING & SOCIAL MEDIA ANALYSIS

- Text mining and sentiment analysis
- Social media analytics (Twitter)
- Lexicon analysis
- Social network analysis

### Note:

*Modules/ topics are indicative only, and the suggested time and sequence may be dropped/ modified/ adapted to fit the total programme hours. Case studies, real world examples and numerical illustrations are an integral part of multiple modules included in the course.*

- The primary mode of learning for this programme is via live online sessions with faculty members.
- The recording of the live sessions will be made available to the participants until the duration of the programme.





# Holistic Curriculum

This comprehensive programme curriculum is integrated with a judicious blend of immersive learning tools such as live online lectures, hands-on exercises using data, real-world case studies, business decision-related projects as well as a final capstone project to reinforce an advanced understanding of data analytics in decision-making. Taught by renowned IIM Kozhikode faculty, this engaging learning experience will empower participants to implement data-driven analytics for making insightful and impactful business decisions in their organisation.

*Note: Modules/ topics are indicative only, and the suggested time and sequence may be dropped/ modified/ adapted to fit the total programme hours.*

## Capstone Project

With the capstone project, participants will gain hands-on learning experience in conducting data analysis scientifically and make insightful and powerful connections between quantitative data analysis and real-world business challenges. This project will provide participants with an opportunity to integrate their theoretical and practical understanding of data science and explore ways to apply their learnings in a real-world competitive business scenario.



# Real-world Case Studies



## **Understanding Text Mining and Sentiment Analysis in Hotel Booking**

by Rasha Kashef, Sakariya Ahmed (Harvard Business Publishing) This case study explores the unpleasant experience of a management science professor with a hotel she stayed at in New York City. Consequently, she wanted to figure out if hotel ratings were enough to recommend a hotel, or if customers' text reviews could be used as more important and accurate indicators of customers' hotel experiences.

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## **Predicting Earnings Manipulation by Indian Firms Using Machine Learning Algorithms** by Dinesh Kumar Unnikrishnan, Tousif Ahmed Inayath Syed, Suresh Ganeshan (Harvard Business Publishing)

This case explores how Sachin Kumar, Director at MCA Technology Solutions, was approached by one of his clients, a commercial bank, to assist them in detecting earnings manipulators among the bank's customers with the help of machine learning algorithms to get better accuracy compared to the other traditional models such as Beneish model used for predicting earnings manipulation.

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## **Armcard Incorporated: Combatting Money-laundering Using Data Analytics** by Davit Khachatryan (Harvard Business Publishing)

This case focuses on enhancing students' understanding and appreciation of data analytics for fraud detection in financial institutions. It explores a predictive analytic solution, in the form of a time series model, for combating money laundering at a regional bank.

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## **Data Science at Target** by Srikant M. Datar, Caitlin N. Bowler (Harvard Business Publishing)

The case explores the technological and organisational challenges faced by Paritosh Desai, VP of Business Intelligence, Analytics & Testing, and the trade-offs he considered in his four-year journey to develop the larger retail business into a data science organisation.

*Note: The programme curriculum includes more such case studies for integrated learning.*

# Learning Outcomes



Gain an in-depth understanding of data structures and data analysis to explore and visualise data for meaningful insights and identify relationships between large data sets



Learn to use analytical tool such as R to manipulate and analyse complex data sets and become proficient in building machine learning models using R



Explore text mining analysis/techniques to understand the influence of social media applications



Understand the nuances and applications of descriptive, predictive, and prescriptive analytics to enhance analytical skills and make real-time, data-driven business decisions



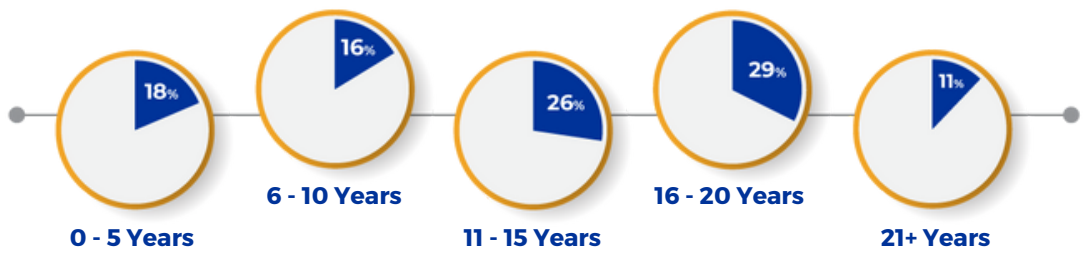
Gain the skills and knowledge required to manage data science and analytics teams or projects at your organisation



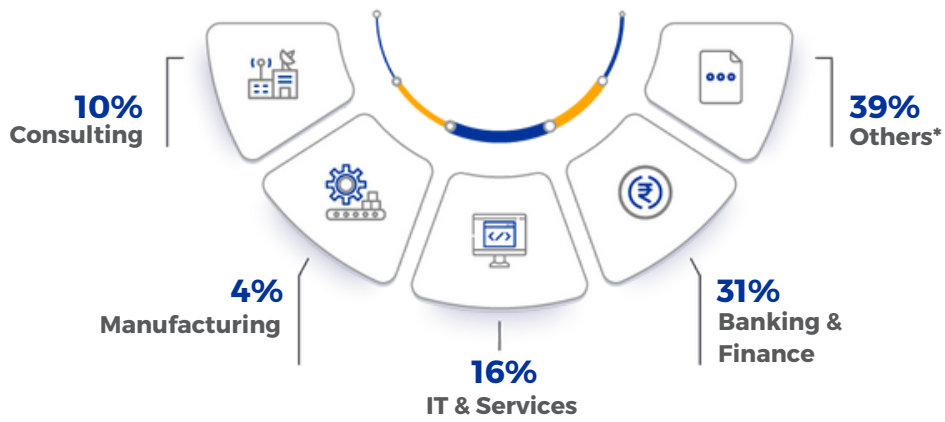
Get the managerial expertise of the tools and techniques used in Data Analytics and Machine Learning for business applications

# Past Participant Profile

## Work Experience



## Industry



\*Others include Healthcare & Pharmaceuticals Shipping, Retail, Media, Consulting, etc.

## Functions



#Others include Customer Service, Engineering, Consulting, Legal etc.

# Participant Testimonials

Course content was well curated for a Manager's need. Prof. Sreejesh is an excellent Teacher and he took immense efforts in ensuring everyone understood the lessons. The course was excellent. I do not have any prior experience in Data Science domain, this course provided me confidence to manage Data Science Projects.

**- Harikumar Vasudevan Nair**



I personally liked the following aspects of the program, The Faculty, Professor Sreejesh's ability to teach such a difficult subject so effectively to a diverse audience from the industry is amazing and commendable. The platform is glitch-free and we have never faced any issues while using it. The timeliness of all communications.

**- Kapil Chourasiya**





# IIM Kozhikode Executive Alumni Status

On successful completion of the programme, participants will be eligible for the prestigious IIM Kozhikode Executive Alumni Status. These participants will subsequently receive the alumni registration details from IIM Kozhikode.

*Note: The Executive Alumni benefits are subject to the discretion of IIM Kozhikode.*

## Certificate

Participants who successfully complete all evaluation components with minimum pass marks and meet the requisite 75% minimum attendance criteria will be awarded a Certificate of Completion from IIM Kozhikode. Participants who are unable to clear the evaluation criteria but have the requisite attendance will be awarded a Participation Certificate.



*Note: All certificate images are for illustrative purpose only and may be subject to change at the discretion of IIM Kozhikode.*

## Eligibility

Graduates (10+2+3) or Diploma Holders (only 10+2+3) from a recognized university (UGC/AICTE/DEC/AIU/State Government/recognised international universities) in any discipline with a minimum of 01 years of work experience (after graduation) as on the Programme start date i.e., September 30, 2023.

## Evaluation

There will be periodic evaluations built-in throughout the programme at regular intervals. These may be in the form of a quiz, assignment, project, case studies or other objective/subjective assessments. A minimum of 75% attendance is a prerequisite for the successful completion of this programme. The participants will have to secure the minimum pass marks in the respective evaluation components.

# Programme Details

**Programme Fee** INR 1,81,500 + GST

**Academic Orientation** Oct 08, 2023

## Instalment Schedule

Particulars	Remarks	Amount
Booking Amount	Within 7 days post selection	INR 18,150 + GST
Instalment I	Oct 02, 2023	INR 45,375 + GST
Instalment II	Nov 21, 2023	INR 63,525 + GST
Instalment III	Jan 10, 2024	INR 54,450 + GST

## Round-wise Application Dates

Particulars	Application Fee	Particulars
Round 1	INR 1,500 + GST	July 31, 2023
Round 2	INR 2,000 + GST	Aug 28, 2023

*Note: Postage charges for books and study materials sent to locations outside of India will be paid by the student.*

## Programme Schedule

### Live Online Sessions

- 3 hours / week
- Sunday, 9 AM to 12 PM

### Attendance

- Minimum 75%

### Note

- Admissions are on a first-come, first-serve basis. There might not be subsequent rounds if seats are filled in the initial rounds.

### Programme Application Link

- [Click here](#) to apply to the programme.
- Finance options available. [Click here](#) to learn more.
- For more information, please email at [iimk.execed@emeritus.org](mailto:iimk.execed@emeritus.org)

*Note:*

- The actual programme schedule will be announced closer to the programme start.
- Some sessions with faculty and/or industry experts could be rescheduled at a different time, in case of exceptional circumstances.

# Application Requirements

Applying to the programme? We suggest you keep the following 3 documents ready.

## 1. Your Photo ID Proof:

- You can submit a scanned copy of ANY ONE of: PAN Card or the first two pages of your Passport.

## 2. Your Graduation/Degree:

- You can submit a scanned copy of ANY ONE of: Degree certificate, provisional Degree certificate, marks transcript or score transcript.

## 3. Your Work Experience Certificate:

- You can submit scanned copy(ies) of document(s) which demonstrate that you have the minimum work experience required by the programme.
- You can confirm the minimum work experience requirement of a programme under the heading '**Eligibility**' in the brochure or the programme website
- Examples of documents you can submit are joining letter, relieving letter, Bonafide work experience letter from your HR, salary slips etc.
  - These documents must be issued by your company.
  - Please ensure that the document(s) you submit contain a date of joining and a date of leaving or a statement about the number of years you have worked at the company.



# System Requirements

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This programme includes live online classes. To attend a live online class you will need to have a PC/Laptop/Mac with

- Speakers and microphone: built-in or a USB plug-in or wireless Bluetooth
- Webcam: built-in or USB plug-in
- Processor: with Dual Core 2Ghz or higher (i3/i5/i7 or AMD equivalent)
- RAM: 4 GB or higher
- OS: Either MacOS 10.7 or higher OR Windows 8 or higher
- An internet connection: Minimum bandwidth of 3.0 Mbps (up/down)
- Browser: IE 11+, Edge 12+, Firefox 27+, Chrome 30+
- Zoom software client installed on your PC/Laptop/Mac

We use the Zoom software application to conduct live online classes. Zoom works on a variety of PCs/ Laptops/Mac systems and also on phones and tablets.

You can join your live online class from a phone or tablet if it supports the Zoom client.

We recommend that you attend classes from a PC/Laptop/Mac.



# About IIM Kozhikode

Started in 1997 with its Post Graduate Programme (PGP), the Indian Institute of Management Kozhikode (IIMK) is on a high growth trajectory today, offering widest range of academic programs in the field of management education. These include Fellow Programme in Management, Executive PG Programmes, Management Development Programmes and Faculty Development Programs. IIMK set up a Satellite campus at Infopark, Kochi, in 2013 dedicated to Executive Education. IIMK has also the unique distinction of launching a PhD (Practice Track) programme for working professionals besides bringing in new dynamic courses like the one-year Post Graduate programme in Business Leadership (2019) MBA in Finance and MBA in Liberal Studies & Management (2020). The institute is also home to IIMK LIVE a first-of-its-kind startup incubation programme and the Indian Business Museum.

IIMK is ranked 3rd as per NIRF India Rankings 2023: Management. The institute also features regularly among top global institutes for its flagship MBA (PGP) and EMBA programme (EPGP) in QS World University Rankings. The Institute has leapfrogged 100 spots to be placed in the Top 251-300 Institutes in Business & Management Studies globally, as per the QS World University Rankings by Subject 2023. It is also Ranked No.2 in CFIs (non-Technical) category in the Atal Innovation Rankings (ARIIA 2021) rankings released recently by Ministry of Education, Govt. of India, and has the distinction of being the only IIM in the coveted innovation rankings. IIM Kozhikode is globally accredited by EQUIS (EFMD) and AMBA (UK).

IIM Kozhikode also made its debut in the prestigious Financial Times Rankings (FT Rankings 2023) at 72nd position among the top-75 Open-enrolment executive program providers globally, catapulting the 27-years young IIM to an exclusive list of foremost providers of executive education in the world. IIM Kozhikode has successfully delivered close to 1300 MDP programmes for the past two decades, training more than 41000 participants from 150+ organisations - which also includes several Fortune 500 companies in the process.



**#2**

Atal Innovation  
Rankings (ARIIA) 2021

**#3**

NIRF India Ranking  
2023, Management

**#3**

India's Best B-School The Week  
- Hansa Research Survey 2022



# About Emeritus

IIM Kozhikode is collaborating with online education provider Emeritus to offer a portfolio of high-impact online programmes. Working with Emeritus gives IIM Kozhikode the advantage of broadening its access beyond their on-campus offerings in a collaborative and engaging format that stays true to the quality of IIM Kozhikode. Emeritus' approach to learning is built on a cohort-based design to maximise peer-to-peer sharing and includes video lectures with world-class faculty and hands-on project-based learning. More than 250,000 students from over 160 countries have benefitted professionally from Emeritus' courses.



Apply for the programme here

**APPLY NOW**

For registration and any other information please get in touch with at [iimk.execed@emeritus.org](mailto:iimk.execed@emeritus.org).

 **WhatsApp an advisor on +91 7208889990\***

*\*Note: This number does not accept any calls. Please message your queries*

In collaboration with



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