50 YEARS OF EXCELLENCE 1973 - 2023
IIM BANGALORE

EXECUTIVE EDUCATION PROGRAMMES

BUSINESS ANALYTICS – THE SCIENCE OF DATA-DRIVEN DECISION MAKING

Programme Director
U Dinesh Kumar

Dates
5-10 June 2023

Strategy & General Management

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> In God We Trust, All Others Must Bring Data.
>
> W Edwards Deming

The theory of bounded rationality proposed by Nobel Laureate Herbert Simon is evermore significant today with increasing complexity of business problems; limited ability of human mind to analyze alternative solutions, and the limited time available for decision making. Business Analytics is a multidisciplinary field that uses expertise such as statistical learning (SL), machine learning (ML), artificial intelligence (AI), deep learning, computer science, information technology, and management strategies to generate value and wealth from data. Business Analytics has become a main functional areas in most companies. Analytics companies develop the ability to support their decisions through analytic reasoning using various statistical and machine learning techniques. Thomas Davenport, in his book titledalytics: The new science of winning", claims that a significant proportion of high-performance companies have high analytical skills among their personnel.

In an article[1] based on a survey of nearly 3000 executives, MIT Sloan Management Review reported striking correlation between an organization's analytics sophistication and its competitive performance. The biggest obstacle to adopting analytics is the lack of knowhow about using it to improve business performance. Business Analytics uses statistical, machine learning, artificial intelligence, operations research, and management tools to drive business performance. Many companies offer similar kinds of products and services based on a similar design and technology and find it difficult to differentiate their product/service from their competitors. However, companies such as Amazon, Google, HP, Netflix, Procter and Gamble, and Capital One uses analytics as competitive strategy. Business Analytics helps companies to find the most profitable customer and allows them to justify their marketing effort, especially when faced with stiff competition. There is a significant

evidence from the corporate world that analytical skills improve the ability to make better decisions.

[1] M S Hopkins, S LaValle, F Balboni, N Kruschwitz and R Shockley, "10 Insights: A First look at The New Intelligence Enterprise Survey on Winning with Data", MIT Sloan Management Review, Vol. 52, No. 1, 21–31.

CONTENT

The course is designed to provide in-depth knowledge of handling data and Business Analytics' tools that can be used for fact-based decision-making using real case studies from different sectors of the industry. Primary objectives of the course are as follows:

1. Understand the emergence of business analytics as a competitive strategy.
2. Learn to analyze data using statistical learning, artificial intelligence, and machine learning algorithms to enable data-driven decision making.
3. Learn data visualization and storytelling through data.
4. Learn descriptive, predictive, and prescriptive analytics techniques and tools.
5. Learn to analyze data using supervised and unsupervised machine learning algorithms.
6. Use analytics for customer requirement analysis, general management, manufacturing, marketing, finance, operations, and supply chain management.
7. Analyze and solve problems of different industries such as manufacturing, service, retail, software, banking and finance, sports, pharmaceutical, and aerospace.
8. Hands-on experience with software such as Microsoft Excel, Evolver, LINDO, SPSS, R, Python, and other proprietary software.

WHO SHOULD ATTEND?

In October 2012, Harvard Business Review claimed that "Data Scientist" role will be the sexiest job of the 21st century. Anyone seeking "sexiest job" should attend this course. This short-duration programme equips the participants with analytical tools and prepares them for corporate roles in analytics-based consulting in marketing, operations, supply chain management, finance, insurance, and general management in various industries. The course is suitable for those who are already working in analytics to enhance their knowledge and for those with analytical aptitude and would like to start new career in analytics.

COURSE CONTENTS:

Introduction to Business Analytics

Converting a business problem to analytics problem; Descriptive, Predictive and Prescriptive Analytics; Analytics Model Building Framework; Data drift, model drift and concept drift; Introduction to Machine Learning Algorithms.

Predictive Analytics using Supervised Learning Algorithms:

Simple linear regression: coefficient of determination, significance tests, residual analysis, confidence, and prediction intervals.

Multiple linear regression: interpretation of regression coefficients, categorical variables, heteroscedasticity, multi-collinearity, outliers, auto-regression, and transformation of variables. Business applications of multiple linear regression in prediction and pricing problems.

Logistic Regression: Deviance, Wald's test, likelihood ratio test, sensitivity, specificity, precision, F-score, area under receiver operating characteristic curve (AUC).

Applications of logistic regression in solving classification problems: Sales propensity, employee attrition, marketing effectiveness.

Classification and Regression Trees (CARTs):

Decision tree learning, solving regression, and classification problems using decision trees.

Forecasting:

Moving average, exponential smoothing, Trend, cyclical and seasonality components, autoregressive integrated moving average (ARIMA).

Application of predictive analytics in retail, direct marketing, health care, financial services, insurance, supply chain, etc.

Ensemble Methods:

Introduction to ensemble methods, random forest and boosting algorithms. Solving classification problems with imbalanced data.

Reinforcement Learning Algorithms:

Introduction to Reinforcement Learning: Markov chain and Markov Decision Process. Applications of reinforcement learning in brand switching and prediction.

Prescriptive Analytics:

Introduction to Operations Research (OR), linear programming (LP), formulating decision problems using linear programming, sensitivity analysis: shadow price and reduced cost, multi-period LP models. Applications of LP in product mix and revenue management problems.

Natural Language Processing:

- Text mining and sentiment analysis

The following analytics cases studies published by IIMB in the Harvard Business publishing will be used during the short-duration programme, in addition to several examples from various sectors.

- Marketing Head's Conundrum at WSES
- Package Pricing at Mission Hospitals
- Predicting earnings manipulations by Indian firms through machine learning algorithms
- Customer Analytics at Flipkart
- Customer Analytics at Bigbasket: Product Recommendations
- Pricing of Players in the Indian Premier League.
- A game of two halves: In-play betting in football.
- Consumer Choice Between House Brands and National Brands in Detergent Purchases at Reliance Retail.
- Breaking Barriers: Micro-mortgage Analytics.
- Fantasy Sports: A Game of Skill or Chance
- Improving lead generation at Eureka Forbes Using Machine Learning Algorithms
- Enhancing Visitor Experience at ISKCON using Text Analytics

TESTIMONIAL

The course was extremely valuable and window opener for me towards the world of Data Analytics. Coming from a Business and operation background, the course gave an insight on the statistical methods, application of Data modelling concepts and real-life case studies which i could relate to my field of work. Prof. Dinesh was extremely knowledgeable on the subject and guided the class phenomenally. The guest lecturers and industry interaction sessions are equally commendable. Being a 6-day session, it gave a glimpse of life at the IIMB campus. Over-all, it was worth the time and effort.

Rajith Shankar,
Working for Al Futtaim Finance PVJSC, in Dubai, UAE as a Business Manager

PROGRAMME DIRECTOR

U Dinesh Kumar

Professor, Decision Sciences
Chairperson MBA (Business Analytics)
IIMB Chair of Excellence

U Dinesh Kumar is a Professor of Decision Sciences and chairperson of data centre and analytics lab (DCAL) at IIM Bangalore and holds a Ph.D. in Mathematics from IIT Bombay. Dr Dinesh Kumar introduced Business Analytics elective course in 2008 to the PGP students at IIM Bangalore and started one of the first certificate programmes in Business Analytics in India in 2010.

Dr Dinesh Kumar has over 20 years of teaching and research experience. Prior to joining IIM Bangalore, Dr Dinesh Kumar has worked at several reputed Institutes across the world including Stevens Institute of Technology, USA; University of Exeter, UK; University of Toronto, Canada; Federal Institute of Technology, Zurich, Switzerland; Queensland University of Technology, Australia; Australian National University, Australia and the Indian Institute of Management Calcutta.

Dr Dinesh Kumar has published more than 70 research articles in leading academic journals. Forty of his case studies on Business Analytics based on Indian and multinational organizations such as Aavin Milk Dairy, Apollo Hospitals, Bigbasket, Bollywood, Flipkart.com, Hewlett and Packard, ISKCON, Jayalaxmi Agro Tech, Larsen & Toubro, Manipal Hospitals, Mission Hospital, Hindustan Aeronautics Limited, Indian Premier League, Reliance Retail, Shubham Housing Finance Limited, VMWare have been published at the Harvard Business Publishing's case portal. Twelve of his case studies are best sellers at the Harvard Business Publishing. His case studies are used by more than 275 Institutions across 75 countries across the world. He has authored 3 books, his recent book is titled, "Business Analytics – The Science of Data Driven Decision Making", published by Wiley in 2021 which was an Amazon Best Seller.

Dr Dinesh Kumar has carried out predictive and prescriptive analytics consulting projects for organizations such as The Boston Consulting Group (India) Private Limited, Cavinkare, Hindustan Aeronautics Limited, Indian Army, Qatar Airways, Mission Hospital, Manipal Hospitals, Scalene Works, Wipro Limited, UNIBIC and the World Health Organization etc.

Dr Dinesh Kumar has conducted training program on Analytics for several companies' companies such as Accenture, Aditya Birla Group, Ashok Leyland, Bank of America, Blue Ocean Market Intelligence, Cisco, Fidelity, Hindustan Aeronautics Limited, Honey Well, Infosys, ITC Info Tech, Ocwen financial Services and so on. Dr Dinesh Kumar conducts corporate training programme in Analytics and trained more than 1000 professionals in the field of analytics.

He is the founding president of the Analytics Society of India (ASI). Dr Dinesh Kumar was awarded the Best Young Teacher Award by the Association of Indian Management Institutions in 2003. He is listed as one of the top 10 analytics academics in India by the analytics India magazine. He is the governing council member of the Karnataka Government's Centre of excellence for Data Science and Artificial Intelligence set up in Collaboration with NASSCOM.

VENUE:
Indian Institute of Management Bangalore

LAST DATE FOR REGISTRATION
26 May 2023

PROGRAMME FEE
INR **1,49,000/-** Residential and INR **1,19,000/-** Non-Residential (+ Applicable GST) per person for participants from India and its equivalent in US Dollars for participants from other countries.

EARLY BIRD DISCOUNT
Nominations received with payments on or before **15-May-23** will be entitled to an early bird Discount of 10%.

Early Bird Fee INR **1,34,100/-** Residential (+ Applicable GST)
Early Bird Fee INR **1,07,100/-** Non-Residential (+ Applicable GST)

GROUP DISCOUNT
Group Discount of **5%** percentage can be availed for a group of 3 or more participants when nominations received from the same organization.

Please Note
All enrolments are subject to review and approval by the programme director. Joining Instructions will be sent to the selected candidates 10 days prior to the start of the programme. **Kindly do not make your travel plans unless you receive the letter from IIMB.**

The programme fee should be received by the Executive Education Office before the programme commencement date. In case of cancellations, the fee will be refunded only if a request is received at least 15 days prior to the start of the programme. If a nomination is not accepted, the fee will be refunded to the person/organisation concerned.

A certificate of participation will be awarded to the participants by IIMB.

The **Indian Institute of Management Bangalore (IIMB)** is a leading graduate school of management in Asia. Under the IIM Act of 2017, IIMB is an Institute of National Importance. Established in 1973, IIMB today offers a range of post-graduate and doctoral level courses as well as executive education programmes. With a faculty body from amongst the best universities worldwide, IIMB has emerged as a leader in the area of management research, education and consulting. IIMB's distinctive feature is its strong focus on leadership and entrepreneurial skills that are necessary to succeed in today's dynamic business environment.

IIMB has around 100 full time faculty members, more than 1200 students across various long duration programmes and nearly 6000 annual Executive Education participants.

IIMB has obtained the European Quality Improvement System (EQUIS) accreditation awarded by the European Foundation for Management Development (EFMD). IIMB has been ranked No. 2 in the India Rankings 2021 in the Management Education category under the National Institutional Ranking Framework (NIRF) by the MHRD.

Executive Education Programmes

The Executive Education engages with the industry through its various Custom and Open enrolment programmes with a view to impart the knowledge and skills necessary to succeed in today's environment. IIMB's Executive Education ranks among the Top 50 Global schools as per Financial Times Executive Education Ranking 2022 and is the only business school from India to figure in this prestigious list of global providers of Executive Education.

Registration

Please log on to IIMB website www.iimb.ac.in/eep for registering online. Do feel free to get back to us if you should have any clarification.

Executive Education Programmes
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IIMB
तेजस्वि नावधीतमस्तु

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