भारतीय प्रौद्योगिकी संस्थान दिल्ली
Indian Institute of Technology Delhi

CERTIFICATE PROGRAMME IN
DATA SCIENCE & MACHINE LEARNING

Starts December 30, 2021 | 6 Months | Live Online Sessions

Programme offered by Continuing Education Programme (CEP), IIT Delhi

OVERVIEW

From Netflix to Google, world-renowned companies have multiplied their business growth with Data Science and Machine Learning (ML) applications, guided by a data-driven approach to decision-making. According to Analytics Insight (2020), around 77% of devices that we presently use are utilising ML. To ensure business's future-readiness in today's digital era, organisations need skilled talent to leverage data science and ML's exponential potential for automation, effective decision-making, and competitive advantage.
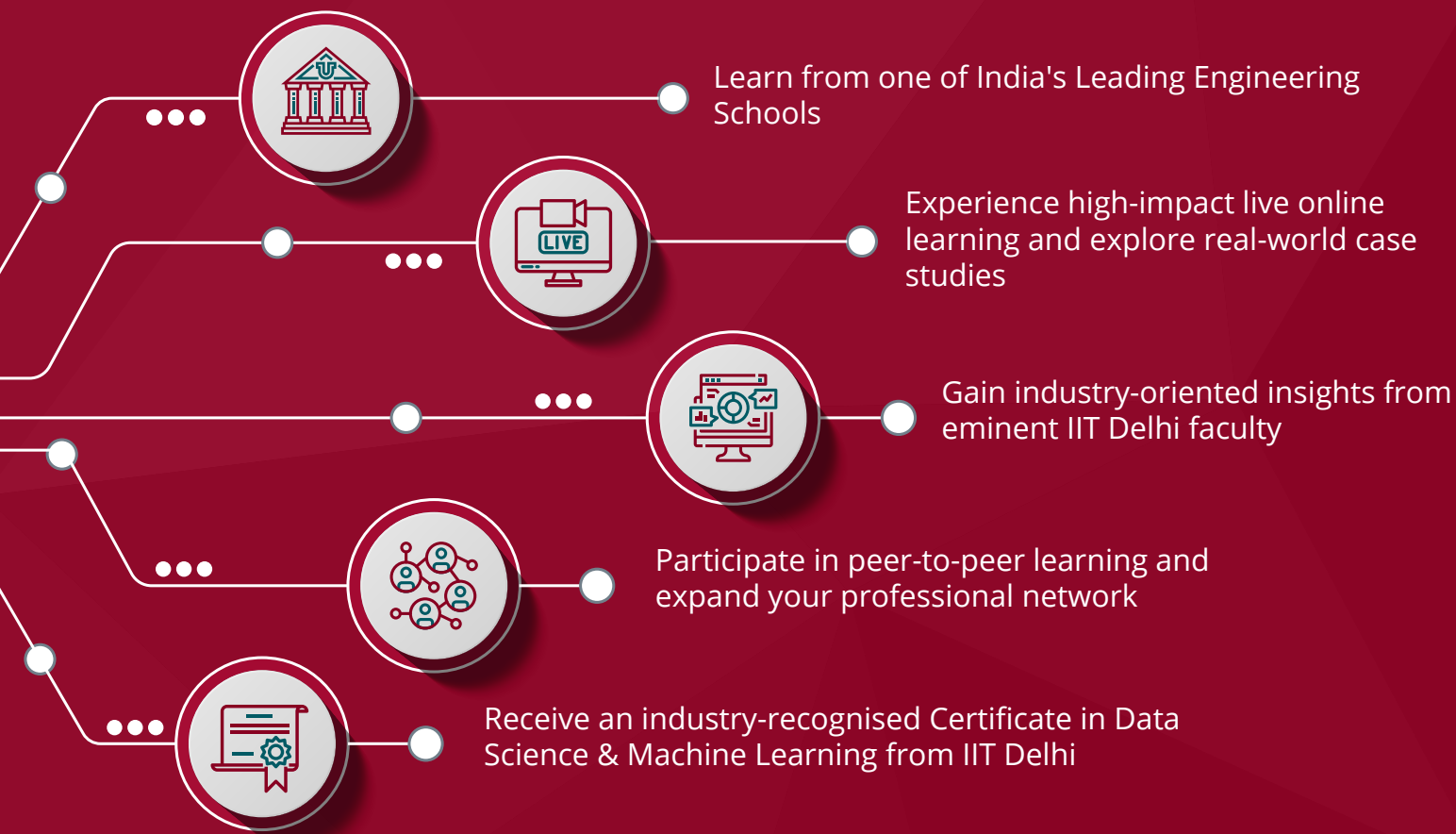
To meet this demand, the Indian Institute of Technology Delhi (IIT Delhi) has designed the six-month live online **Certificate Programme in Data Science & Machine Learning**. This high-impact programme will help you draw on the expertise of IIT Delhi's renowned faculty in an immersive industry-oriented learning pedagogy to build robust predictive and prescriptive models with hands-on experience in ML algorithms and statistical models. Become industry-ready with an in-depth understanding of in-demand data science and machine learning tools and techniques with Python.

WHO IS THIS PROGRAMME FOR?

This programme is best suited for:

- Early and mid-level Professionals interested in gaining a relevant and cutting-edge perspective on data science and ML for better career prospects

- Professionals who oversee software development and machine learning projects with a keen interest in developing a data-driven decision-making approach and those looking to apply data science and ML to enhance their business growth

PROGRAMME HIGHLIGHTS

Learn from one of India's Leading Engineering Schools

Experience high-impact live online learning and explore real-world case studies

Gain industry-oriented insights from eminent IIT Delhi faculty

Participate in peer-to-peer learning and expand your professional network

Receive an industry-recognised Certificate in Data Science & Machine Learning from IIT Delhi

PROGRAMME MODULES

The programme's industry-oriented curriculum will give you exposure to statistics for data science, optimisation formulations with ML, deep learning, and storytelling with data. Experience immersive live online learning to gain actionable insights through a mix of lectures, tutorials using data, hands-on experience with tools like Python, and real-world case study discussions.

Module 1
Statistics for Data Science

- Fundamentals of Python*
- Fundamentals of Mathematics - Linear Algebra/Probability
- Measures and descriptors of data, Distributions and Estimation
- Exploratory data analysis
- Hypothesis testing and evaluation

Module 2
Communicating Data and Analysis

- Data and Information Systems
- Story Telling with Data
- Designing Business Dashboards

Module 3
Optimisation for Machine Learning

- Optimisation formulations
- Gradient and search-based optimisation for machine learning
- Linear, Quadratic, and Nonlinear Programming
- Multi-objective and multi-criteria decision-making - evolutionary tools

Module 4
Machine Learning

- Regression and derivatives
- Trees and random forests
- Support vector machines
- Clustering – mixture models, hierarchical k-means clustering
- Dimensionality Reduction: PCA

Module 5
Deep Learning

- Deep feedforward neural nets
- Convolutional neural nets
- Long short-term memory (LSTM) networks
- Introduction to Graph Neural nets, Generative Adversarial Networks, and Reinforcement Learning

Project

- Integrative Exercise
- Project Presentations

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

*Fundamentals of Python will be taught via recorded sessions by the IIT Delhi faculty. The faculty will be conducting Q/A on the same.

Top Business Applications of Machine Learning
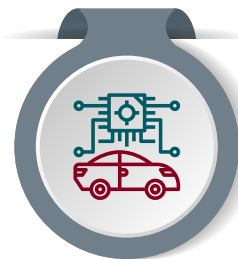
eCommerce
Customer Support, Product Recommendation

Healthcare
Drug Discovery, Disease Diagnosis

BFSI
Algorithmic Trading, Portfolio Management

Transport
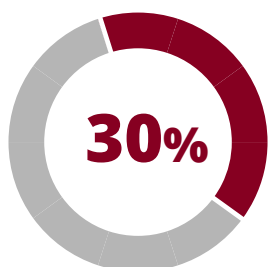Safety Monitoring, Air Traffic Control
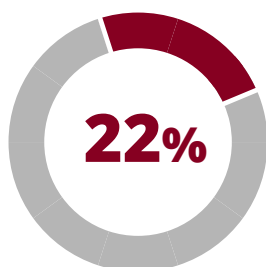
Heavy Engineering
Industry 4.0, Predictive Machine Analytics

Source: SAS, 2020
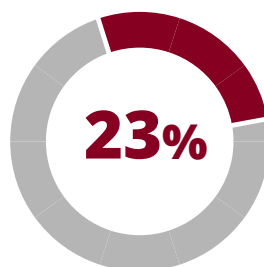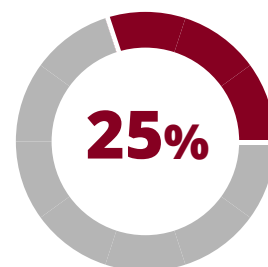
PAST PARTICIPANT PROFILES

Work Experience

30%
<4 Years

22%
5 to 9 Years

23%
10 to 14 Years

25%
15+ Years

Industries

40%
IT Services
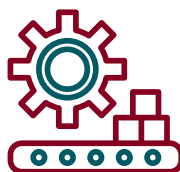
7%
Manufacturing

5%
BFSI

3%
Consulting

3%
FMCG

42%
Others*

Others include Bioinformatics, Education, Infrastructure, Healthcare, Renewable Energy, and Travel, amongst others.

PROGRAMME COORDINATORS

Dr Hariprasad Kodamana
Assistant Professor
Department of Chemical Engineering
Joint Faculty, School of AI
Indian Institute of Technology Delhi

Dr Hariprasad Kodamana is a PhD from IIT Bombay, where he received the Institute Award for Excellence in PhD thesis. His research interests include machine learning, optimisation, model-based control, fault detection and diagnosis. His research work has been published in various notable international peer-reviewed journals and presented in leading conferences.

Dr Agam Gupta
Assistant Professor
Department of Management Studies,
Associate Faculty, School of AI
Indian Institute of Technology Delhi

Dr Agam Gupta is a fellow of the Indian Institute of Management Calcutta (IIM Calcutta). His research areas include platform ecosystems, digital marketing, computational social science, and complexity. He has taught various courses on data visualisation and data mining. His research work has featured in reputed international journals and conferences proceedings.

Dr Manojkumar Ramteke
Associate Professor
Department of Chemical Engineering
Associate Faculty, School of AI
Indian Institute of Technology Delhi

Dr Manojkumar Ramteke is a PhD from the Department of Chemical Engineering, IIT Kanpur. He has also worked as a scientist at the Institute of Chemical and Engineering Sciences (ASTAR), Singapore. His research work is focused on multiobjective optimisation of process applications, scheduling and planning of chemical processes, control of chemical processes, novel meta-heuristic and Machine Learning algorithms, and DNA computing and bio-sensors.

LEARNING OUTCOMES

Build predictive models using neural networks and time series data forecasting models

Gain hands-on experience in machine learning algorithms, the statistical models behind them and the applications of ML
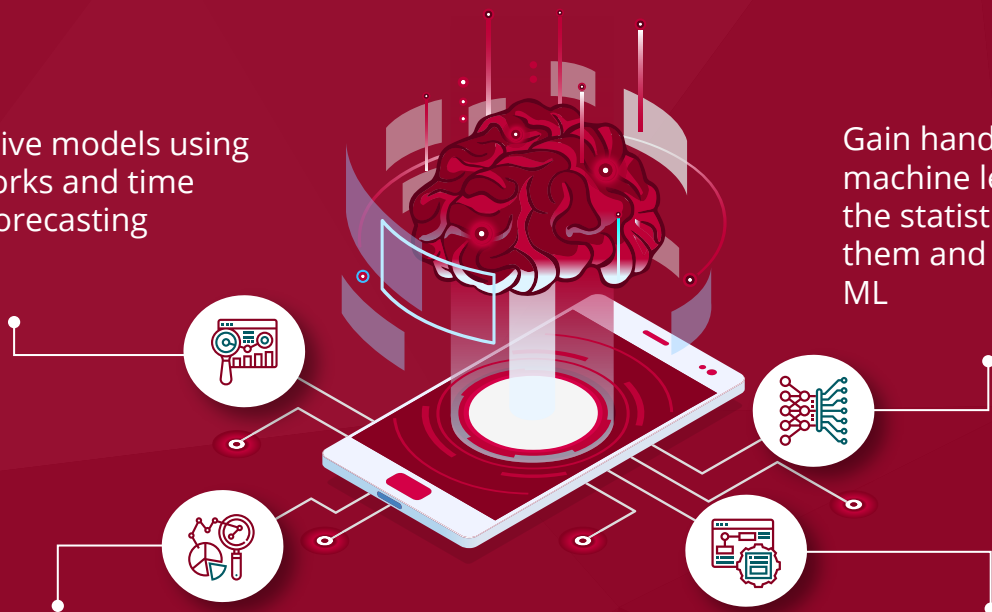
Develop an in-depth understanding of popular methods like regression, clustering, decision trees and deep learning

Learn optimisation formulations to minimise errors and build accurate models

PROGRAMME CERTIFICATE

Participants will be awarded a successful completion certificate from IIT Delhi on scoring at least 50% marks on aggregate in any two out of three quizzes and maintaining a minimum attendance of 70%. Participants who are unable to maintain 50% marks in the evaluation components, but have a minimum attendance of 90% shall be awarded a participation certificate.
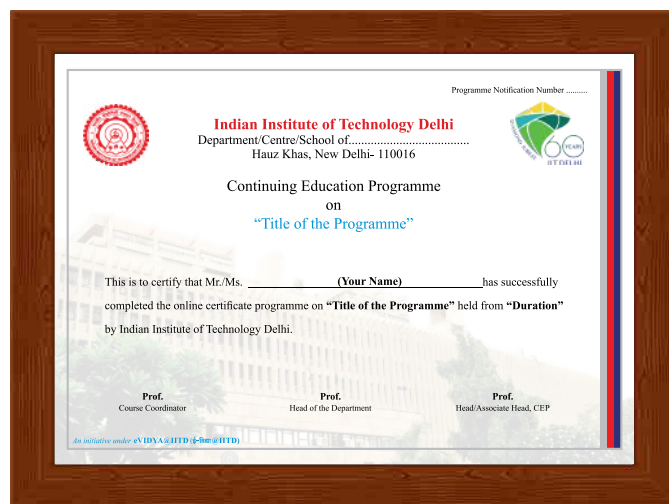
Note: All certificate images are for illustrative purposes only and may be subject to change at the discretion of IIT Delhi. Only e-certificates will be issued by CEP IIT Delhi.

PROGRAMME DETAILS

Programme Schedule

Duration	6 Months
Academic Orientation	Jan 23, 2022
Live Online Sessions	3 hours/ Sunday 12:15 PM - 3:15 PM
Programme Application Link	Click here to apply to the programme

Eligibility
- Graduates (10+2+3)/ Diploma Holders (only 10+2+3) from a recognised university in any discipline
- **PREREQUISITE:** Participants with a background of 10+2 mathematics, or course completion in statistics at UG level are preferred. Exceptions can be allowed if the participants have sufficient work experience in the data science field. Basic programming skills preferably Python will be helpful.

Selection Process:
- Screening and selection will be done by IIT Delhi

Evaluation
- At the faculty's discretion, three assessments consisting of an hour-long online quiz will be conducted

PAYMENT SCHEDULE

Programme Fee   INR 1,25,000 + GST

Instalment Schedule

	Instalment 1	Instalment 2	Instalment 3
Remarks	Dec 26, 2021	Feb 9, 2022	Apr 9, 2022
Amount	INR 19,000 + GST	INR 44,000 + GST	INR 62,000 + GST

Note:
- The actual programme schedule will be announced closer to the programme start.
- GST (currently @ 18%) will be charged extra on these components.

Last Date to Apply	Dec 28, 2021
Shortlisted Candidates Will Be Informed by	Dec 31, 2021
Last Date to Submit the Fee	Dec 26, 2021

Note: Applications will be reviewed based on eligibility and subsequent shortlisting process as laid down by the Programme Coordinators.

All fee should be submitted in the IIT Delhi CEP account only, and the receipt will be issued by IIT Delhi CEP account for your records.

APPLICATION REQUIREMENTS

Education Document:
- Higher Secondary (10+2) Marksheet
- Consolidated graduation mark-sheet
- Passing Certificate – Diploma/ Degree/ Doctorate

Experience Documents (If Applicable):
- For Previous Organisation(s): Relieving letters
- For Current Organisation: Current Salary Slip or Bonafide Certificate from the HR department on company letterhead

ID Proof:
- Any Government-issued photo ID like PAN Card/ Driving License/ Passport, etc.
- Submission of passpost-size photo during application is mandatory

SYSTEM REQUIREMENTS

This programme includes live online classes conducted on Zoom. 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 PCs/ Laptops/ Mac.

ABOUT IIT DELHI

The Indian Institute of Technology Delhi (IIT Delhi) is one of the 23 IITs created to be Centres of Excellence for training, research and development in science, engineering and technology in India. Established as College of Engineering in 1961, the Institute was later declared as an Institution of National Importance under the "Institutes of Technology (Amendment) Act, 1963" and was renamed as "Indian Institute of Technology Delhi". It was then accorded the status of a Deemed University with powers to decide its own academic policy, to conduct its own examinations, and to award its own degrees.

Since its inception, over 48000 have graduated from IIT Delhi in various disciplines including Engineering, Physical Sciences, Management and Humanities & Social Sciences. Of these, nearly 5070 received PhD degrees. The number of students who graduated with a B.Tech degree is over 15738. The rest obtained a Master's Degree in Engineering, Sciences and Business Administration. These alumni today work as scientists, technologists, business managers and entrepreneurs. There are several alumni who have moved away from their original disciplines and have taken to administrative services, active politics or are with NGOs. In doing so, they have contributed significantly to the building of this nation, and to industrialisation around the world. For more details, please visit: www.iitd.ac.in

ABOUT CONTINUING EDUCATION PROGRAMME (CEP)

Executive education is a vital need for the companies to build a culture that promotes newer technologies and solutions and builds a workforce that stays abreast of the rapidly transforming needs to the technological, business and regulatory landscape.

Committed to the cause of making quality education accessible to all, IIT Delhi has launched Online Certificate Programmes under eVIDYA@IITD (ई-विद्या@IITD): enabling Virtual & Interactive-learning for Driving Youth Advancement@IITD for Indian as well as international participants. These outreach programmes offered by the Indian Institute of Technology Delhi (IIT Delhi) are designed to cater to the training and development needs of various organisations, industries, society and individual participants at national and international level with a vision to empower thousands of young learners by imparting high-quality Online Certificate Programmes in cutting-edge areas for their career advancement in different domains of engineering, technology, science, humanities and management. For more details, please visit: http://cepqip.iitd.ac.in

ABOUT ERUDITUS

Eruditus Executive Education offers customised and open programmes in India, Singapore, Dubai and other global locations in collaboration with MIT Sloan, Columbia Business School, INSEAD, Harvard Business School (HBS), Kellogg Executive Education, Berkeley Executive Education, Wharton Executive Education, IIM Lucknow Executive Education, IIM Calcutta Executive Education and Emeritus. Our world-class executive education programmes, supported by eminent programme experts, provide an immersive learning experience integrated with actionable insights and practical business applications. The meticulously curated programmes are delivered in a different range of formats; in-class, online, as well as blended programmes. Our extensive portfolio also includes short 2-4 day in-class workshops, online courses of 2-3 months duration as well as comprehensive learning journeys that run over 6-9 months, customised to an organisation's requirement.

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For registration and any other information,
please get in touch with us at iitd@eruditus.com

For any feedback, please write to Head CEP, IIT Delhi
at hodqipcep@admin.iitd.ac.in

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 WhatsApp an Advisor On +91 7208889990*

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

Service Provider

ERUDITUS
EXECUTIVE EDUCATION

Disclaimer: Online Certificate Programmes are offered by the Indian Institute of Technology Delhi under the aegis of Continuing Education Programme (CEP) so that the Institute can realise its vision of serving as a valuable resource for industry and society, and fulfil its mission to develop human potential to its fullest extent so that intellectually capable and imaginatively gifted leaders can emerge in a range of professions.

Programme offered by Continuing Education Programme (CEP), IIT Delhi