

DATA ANALYTICS FOR MACHINE LEARNING WITH 'R'



12

MODULES

50

HOURS

25

INTERACTIVE
SESSIONS

2

PROJECTS

**IIIT-Bhagalpur in collaboration with
Vitti offered Certification Course on
“Machine Learning with R”**



भारतीय सूचना प्रौद्योगिकी संस्थान भागलपुर
Indian Institute of Information Technology
Bhagalpur

in collaboration with



PROGRAM OVERVIEW

This IIIT-Bhagalpur Certified Intensive Lab Oriented Course is focused on building industry ready Data Analyst who can work on machine learning, data mining, and statistical modelling for predictive and prescriptive enterprise analytics. This program will enable you to develop deep understanding and experience with Machine Learning and Data Analysis. Familiarity with common tools for data management and analysis including machine learning can be applied on real world problems for building predictive models using machine learning on your own.

R is the most popular Data Analytics tool owing to it being open-source, its flexibility, packages and community. "R" wins on Statistical Capability, Graphical capability, Cost, rich set of packages and is the most preferred tool for Data Scientists.

Machine Learning with R

Line-up for rewarding careers in emerging technologies and become experts with IIIT-Bhagalpur Professional Development Program to gain knowledge, practical know-how to solve complex business problems.



PROGRAM HIGHLIGHTS

Vitti has established an AI & Innovation Hub in collaboration with IIIT-Bhagalpur experts to re-skill and re-tool working professionals towards Artificial Intelligence space, this program offers the following benefits: (i) Experienced Faculty Led Sessions (ii) Live-Interactive Online Classes (iii) Program Content & Structure designed in collaboration with IIIT-Bhagalpur Faculty and Vitti Industry experts.



TOP NOTCH IIIT FACULTY LED SESSIONS

50 Hours of Interactive Live & Lab oriented Classes. Program content & structure designed by IIIT-Bhagalpur in conjunction with Vitti.



REAL-LIFE CASE

Live project based on any of the selected use cases, involving implementation of R tool providing hands-on exposure.



ASSIGNMENTS

Each class has practical assignments which shall be finished before the next class and helps you to apply the concepts taught during the class.



ACCESS TO LMS

You get access to Vitti Learning Management System (LMS) where presentations, quizzes, installation guide & class recordings are there.



24X7 EXPERT ONLINE

Support team to resolve all your technical queries



CERTIFICATION

IIIT-Bhagalpur certifies you as a 'Data Analytics for Machine Learning with R' based on your project performance, reviewed by our expert panel.

COURSE DELIVERY **METHODOLOGY**

Online Live Interactive course led by IIIT-Bhagalpur & Vitti faculties focused on Problem-based-learning methodology allowing students to become more active learners as they figure out which information is needed to solve a problem. There are many advantages to students in using this approach, as it allows them to:

- Develop transferable skills and enhance their employability
- Improve communication and team working
- Practice research and information processing
- Develop Machine Learning analytical skills

All enrolled participant's will be provided access to other learning aids, reference materials, assessments and hands on workshops as appropriate. During the course students will also be allocated Project work that is designed to provide adequate practical and hands on experience in implementing the concepts learned during the course.

PROGRAM **OUTCOME**

On completion of the program, students will have developed a world-class skill-set in their selected technology domain that provides "Employability Enhancing" skills and capabilities thereby substantially increasing their earning potential and compensation benchmarks.

CANDIDATES CAN EXPECT TO BE HIRED IN POSITIONS SUCH AS:

- **Machine Learning Specialist**
- **Data Science Researcher**
- **Data Engineer**
- **Data Analyst**

PROGRAM CONTENT

DATA ANALYTICS FOR MACHINE LEARNING WITH R

Duration: 50 Hrs.

Data Analytics for Machine Learning with R is organized in twelve modules over 50 Hrs. The course will be in two parts

- Introduction to R, Data Visualization & statistics with hands on lab sessions.
- Building predictive models & introduction to latest tools/ technologies for solving real-life problems.

1. Basics Of Artificial Intelligence, Machine Learning & Data Analytics With R

- Introduction to Artificial Intelligence (Evolution of Technology)
- Branches of Artificial Intelligence and what is Machine Learning.
- Supervised, Unsupervised & Reinforcement Learning.
- How machine learning can be applied in technology, science, trading etc.
- Comparison B/W R, Python & SAS.
- Why Learn R?
- Introduction to R.
- R Overview, R Interface,
- R Work Space, Help, Variables, Programming

- Install R.
- Running a few simple programs

2. Basic Programming in R

- Some Common Terms & Basics in R
 - Data Types
 - Importing Data
 - Keyboard Input, Database Input, Export Data
 - Variable Labels, Value Labels, Missing Data, date Values
- R Iteration & Conditional Constructs.
- R Packages: installation and Usages.
- Data Manipulation
 - Creating New Variable
 - Operators
 - Built-in functions

- Control Structures
 - User Defined Functions
 - Sorting Data
 - Merging Data
 - Aggregating Data
 - Reshaping Data
 - Sub-setting Data
 - Data Type Conversions
- Hands On Session
- Some Advance Programs using Data from R Data repository

3. Data Visualization and Basic Statistics

- Introduction to Data Visualization
- Basic Graphics: line, bar, box, histogram plots
- Trellis
- Scatter plots
- Basic Statistics: mean median, mode, percentile, quantile

- Frequency Distribution, Histogram Analysis
- Data: Distribution Types of Data Distribution Hypothesis Testing

4. Basic Statistics

- Basic Statistics using R
 - Sample Data: Summarizing Samples
 - Cumulative Statistics
 - Summary Statistics for Data Frames
 - Summary Statistics for Matrix objects
- Hands on Practice
- Basic Statistics using R
 - Summary Statistics for Lists
 - Summary for Table objects

- Hands on Practice

5. BUILDING PREDICTIVE MODEL

- Introduction to Predictive Models
 - Linear Regression
 - Logistic Regression
 - Decision Tree
 - Random Forest
- Implementation of Predictive Models using R
- The Art of Feature Engineering. Pattern recognition Principal component analysis.

6. Introduction To Latest Tools & Technologies

- Classification & Clustering
 - Supervised Learning
 - K- Nearest

Neighbors

- Classification
- Unsupervised Learning
 - K – means Clustering Algorithm
- Reinforcement Learning
- Implementation of Classification & Clustering Using R
- Introduction to Neural Networks
- Introduction Deep Learning.
- Implementation of Neural Network using R
 - Multi layer Perceptron (MLP)
 - Support Vector Machine (SVM)

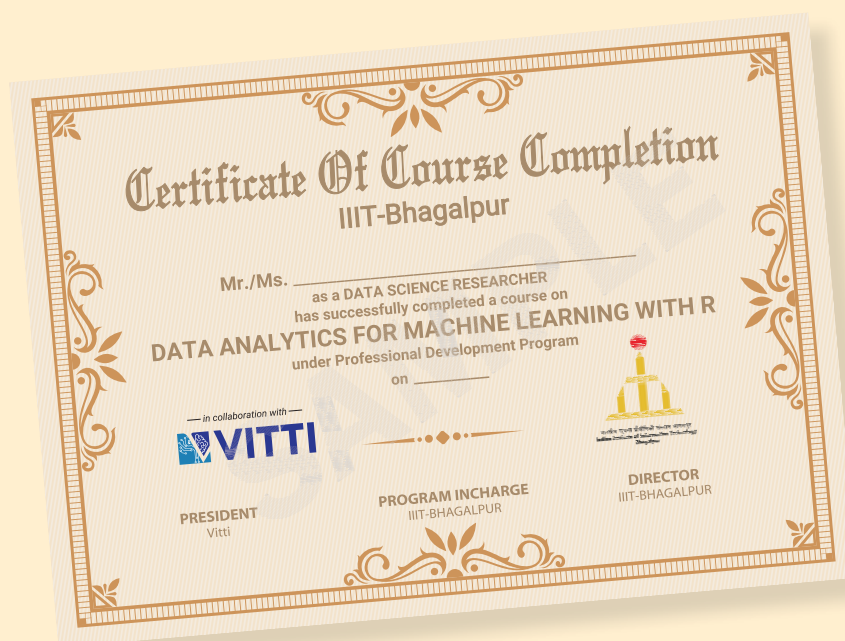
WHO SHOULD **ATTEND**

- Professionals who want to learn the practical aspects of data handling across applicable areas like Machine Learning, IT Services, Marketing, eCommerce, Research etc.
- Project Managers, Business Managers and Senior Leaders managing large data analytics machine learning based projects interested in gaining understanding of AI/ML domain.
- Executives, young professionals & managers with analytical aptitude who are interested in and want to learn Data
- Individuals who aspire to switch to or embark on a career in Business Analytics & Machine Learning

PRE-REQUISITES

- **Mathematics as a subject up to Class XII.**
- **Programming knowledge will be preferable**
- **Though full-fledged Lab access will be provided at IIIT-Bhagalpur facility, it will be preferable to bring your own laptop**

IIIT-BHAGALPUR CERTIFICATION “DATA ANALYTICS FOR MACHINE LEARNING WITH R”



FACULTY PROFILE



DR. A. K. SINHA

He is one of the members of the Advisory Board of Universal Systems Technology, Inc, USA. Holds a PhD degree in Systems Modelling from IIT Delhi, M.Tech (Control System) from IIT Delhi and B.Sc. Engineering from Bihar University.

He has 35 years of teaching, research, and consultancy experience in the various fields of computer science along with AI & ML. Guided 7 Ph.D. and more than 30 M.Tech scholars.

He is a well-known name in the field of Artificial Intelligence space.



DR. DEEPTI YADAV

She is an enthusiastic Data Scientist with 16 years of experience in teaching, research & consultancy and holds Ph.D. in machine learning based data analysis from IIT (Roorkee). Currently, she resides in Silicon Valley, USA and provides consultancy services.



KUNAL GERA

Kunal is a educator, mentor author and consultant. Worked as a business and data Analyst with 10+ years of international and domestic experience. Worked for numerous industries in US, Canada, Africa, Australia and Gulf countries. Worked on project such as consumer analytics, credit card analytics, NLP implementation and computer vision.



DR. RUPAM BHATTACHARYYA

Rupam Bhattacharyya is Ph.D. in Computer Science & Engineering from Tezpur University. Recipient of Scholarship by University of Stirling, Scotland, UK, GATE Scholarship and got Williamson Magor Scholarship. Certified FPGDST from CDAC Bangalore. Presently Teaching at IIIT Bhagalpur.



DR. SANDEEP RAJ

Sandeep Raj (Member, IEEE), Ph.D in Electrical Engineering from IIT, Patna, Currently serving as an Assistant Professor with the Deptt. of Electronics and Communication Engineering, IIIT- Bhagalpur. He served as a Visiting Faculty with the National Institute of Technology Patna. His current research interests include biomedical signal & image processing, embedded systems, machine learning, and Internet-of-Things.



DR. DILIP KUMAR CHOUBEY

He is Ph.D. in Engineering from Birla Institute of Technology, Ranchi and has more than 9 years teaching & research experiences. He is an Assistant Professor in the Deptt. of Computer Science & Engineering, IIIT- Bhagalpur. He is a author of 2 book and has more than 44 reputed research publications in international journals, book chapters and conference proceedings. He has also one project as a Co-PI funded by TEQUIP Collaborative Research Scheme.

INDUSTRY EXPERTS



KUNDANA LAL

As part of the founding team of Vitti, Kundana Lal is the President @ Vitti. Kundana brings over 25 years of industry experience in various IT-related senior leadership role, building businesses, handling corporate and marketing strategies, solidifying profitable relationships with Fortune 500 companies. He was Vice President with Capgemini heading Cloud & AD deliveries for Continental Europe. He has done his Masters in EEE from BIT, Ranchi with specialization in Artificial Intelligence.



SHWETANK SHARAD

He is a Managing Partner on the Executive Board of Vitti. He is a Senior Executive with over 25 years of experience in IT, ITES/ Business Process Services covering Business Transformation, Robotic Process Automation (RPA), Artificial Intelligence and Service Excellence. He is a GE certified Six Sigma Master Black Belt, Certified Robotic Process Automation and Artificial Intelligence-Machine Learning (AI-ML) professional.



SHASHIKANT CHOUDHARY

He completed his MBA in Marketing & IT in 2001 from Symbiosis Institute of Management Studies, Pune. He has more than 19 years of enriched and diverse experience in IT Sales and Business Development in Companies such as, Oracle India, Wipro Technology, and BMC Software etc. He has rich experience of engaging at leadership levels in Govt. and PSUs.



DR. DILIP NANDKEOLYAR

An alumnus of Asian Institute of Management Manila Philippines, DR. DILIP NANDKEOLYAR is a Management post graduate, specialized in Marketing and Strategic Planning & is a B.Sc. (Hons) in Chemistry. He has a Doctoral degree from Thapar University, Patiala.

The guiding philosophy behind all the endeavours of Dr. Nandkeolyar has always been to succeed because his Employers, Peers, Subordinates, Customers, Clients, Students/ Trainees or anyone choosing to associate with him must – by delivering value plus.



SOUMITRA PODDAR

He is one of the distinguished alumni of Vinod Gupta School of Management, IIT Kharagpur. He graduated from the institute in the year 1995 after achieving his specialization in Finance and Information Systems. Before coming to VGSoM, he worked with Mastek Limited as a consultant and gained a good technical exposure of the industry. Later in 2002, he joined IBM and with his managerial acumen, today he has reached the level of Delivery Project Executive.



VANESSA KLOTZMAN

A USA based Software Engineer Gained experience with performance analysis and optimization from a database perspective. She has worked closely with the SIMBA administration team in the Walt Disney Company to develop a self-service portal for all SIMBA users. This portal assist the SIMBA users in submitting requests to the administration team and aid in the automation of manually intensive tasks.



YOGESH PARGAIEN

Experienced and driven data scientist with rich experience in the industry. Conducted individual training sessions for employees in Microsoft Azure, Big Data Tools & Technology, Machine Learning and Amazon Web Services. Trained 30+ groups in Big Data technology stack along with machine learning and projects.



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