Learnbay

Executive Program in **Data Science & AI**

In Collaboration with

E&ICT Academy
IIT Guwahati

Industry Partners

IBM Microsoft

175% Average Salary Hike

Hybrid Model for Project Sessions

450+ Hiring Partners

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CONTENT

Message from CEO, Learnbay

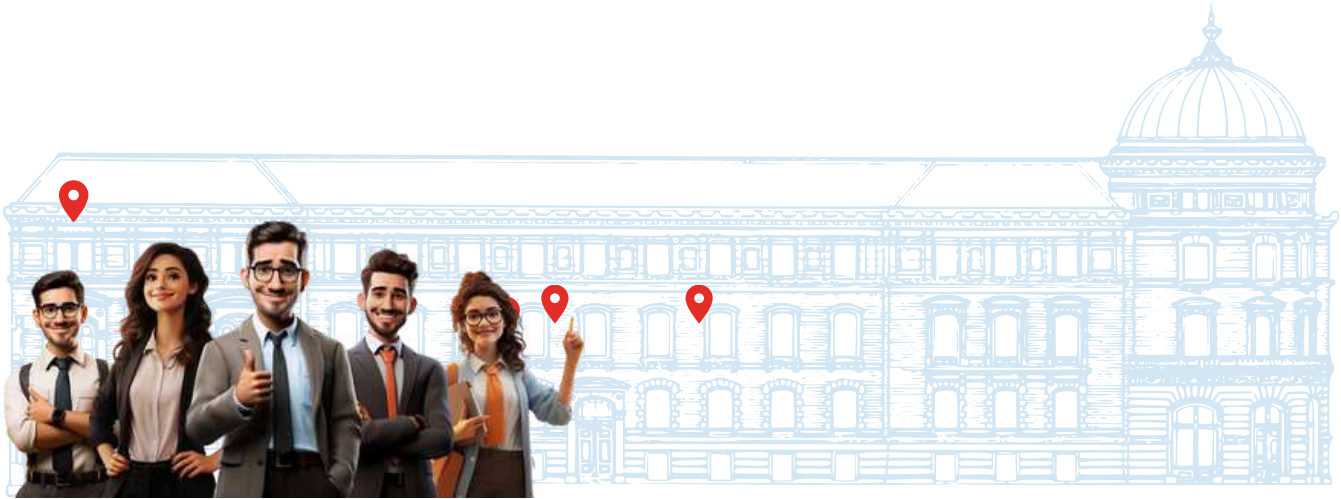
As Learnbay's CEO, I'm excited to welcome you to an amazing journey in learning. Here at Learnbay, we're all about helping you grow in Data Science and more. We think learning can open up endless chances for everyone.

We're not just about the usual school stuff; we're here to support your career in every way possible. What makes Learnbay special is how much we care about your success. I'm inviting you to start a great learning journey with us. Come be a part of Learnbay and see how dedication and passion can really change your path to being the best.

Message from Principal Investigator, E&ICT Academy IIT Guwahati (Dr. Gaurav Trivedi)

As the principal investigator at E&ICT Academy IIT Guwahati, I'm happy to support and work with Learnbay on their Data Science and AI course.
We at E&ICT Academy IIT Guwahati, aim to lead the way in learning and research in Data Science and Artificial Intelligence.

I wish you all good luck with your studies at Learnbay and am excited to see how you all do and grow in the interesting areas of Data Science and Artificial Intelligence



About **Learnbay**

Learnbay is an online learning platform designed to empower working professionals by offering specialized courses tailored to various industries. At its core, Learnbay focuses on bridging the gap between academic knowledge and real-world applications, particularly in the fast-evolving fields of technology and data science. What sets Learnbay apart are its USPs - the Domain Specialization Courses and the Project Innovation Lab. These features are specifically designed to cater to the needs of different sectors, ensuring that learners not only gain theoretical knowledge but also hands-on experience with real-world projects. We also provide 360° career support for all our learners.

2cr
Worth scholarships awarded

600+
Professionals secured jobs after a career break

35k+
Trusted learners

4.79/5

4.66/5

4.8/5

Great Place To Work. Certified

Thousands of student reviews on Switchup, Course Report, Google and more

Learnbay × E & ICT Academy IIT Guwahati

The E&ICT Academy at IIT Guwahati is a joint initiative supported by the Indian Government's Ministry of Electronics & Information Technology. Its goal is to prepare the upcoming tech experts, improve job chances, and grow skills in electronics and IT fields.
The Academy provides online courses like Data Science, AI & ML, Big Data, Cloud Computing, Web Development, VLSI Design, and Management. Over 2500 students and professionals have benefited from their training. They offer a top Advanced Certification in Full Stack Data Science & AI in collaboration with IIT Guwahati, which includes special guest lectures and a chance to experience IIT Guwahati's campus for two days.

Exclusive Features with E&ICT Academy IIT Guwahati

Advanced Certification of Full Stack Data Science & AI, jointly offered by E&ICT Academy IIT Guwahati

Guest Lectures from top faculties of IIT Guwahati

Optional 2-day campus immersion at IIT Guwahati

About the **Program**

Learnbay's Executive Program in Data Science and AI is crafted to set you on a path of success in the fast-evolving Data Science and AI industry. This program offers a deep dive into Data Science and AI, equipping you with the skills needed to excel in this dynamic field.

Duration :

The total duration of this program is **11 months**

Eligibility

- Open to all: Whether you're a student, recent grad, or working professional
- Perfect for eager learners who don't quit easily
- Don't worry if you've never coded before – no experience needed

Who is this **Program for?**

- People wanting to start a career in Data Science
- People aiming to improve their skills with a top-level IIT certificate

Alumni Spotlight

Shravanthi A

Data Scientist

Learnbay has helped me a lot to learn data science applications in the e-commerce industry. The live class concept was really helpful in receiving proper DS training. Thanks to all my mentors and the placement team.

Mechanical Domain ➡ **Data Scientist @** Ford

230% Salary Hike

Preksha Mishra

Lead Data Scientist

The course structure is excellent with emphasis on concept building and tools & software at the same time. The support team is excellent and supportive and quite agile to respond to doubts.

Telecom Domain ➡ **Data Scientist @** HCL

140% Salary Hike

Karan Chawala

xceedance ⬇ EXL

Data Scientist

Jaya Sinha

Aditya Birla Group ⬇ Infosys

Senior Analyst

Shubham Dev

publicis sapient ⬇ brillio

Lead Data Analyst

Alumni Spotlight

Mohd. Israr
Data Scientist

Thanks to the Learnbay data science course & excellent guidance, I was able to ace the TCS interview and secure a job with a 210% pay raise. The real-world time projects helped me develop my concepts as a data scientist.

Mechanical Domain ➡ **Data Scientist @** TCS

210% Salary Hike

Saurabh Kumar
Data Scientist

When I joined Learnbay I did not have any knowledge apart from the very basics. I gradually build my concept via various trainers and get trained in data science with strong knowledge/concepts.

Mathematics Professor ➡ **Data Scientist @** Teleperformance

135% Salary Hike

Aravind

TheMathCompany ⬇ CATERPILLAR

Senior Data Scientist

Ritesh Kumar

unacademy ⬇ Capgemini

Data Scientist

Ramki

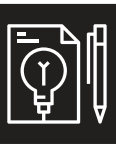
cognizant ⬇ ANBSYSTEMS energizing solutions

Data Analyst

Learnbay's ProjectLab

Choose Learnbay for your career journey because we're more than just a training provider. Our Project Innovation Lab lets you apply your skills in real-world scenarios. Get dual certifications for a competitive edge. Specialize in your desired domain. Discover how Learnbay can boost your career growth. Don't settle for less – choose Learnbay, your path to success!

1 Project Innovation Lab



Work in an industry like environment and gain practical hands-on experience of data scientist with dedicated mentors from industry.

2 Dedicated Placement Cell

Experience 100% placement assistance with guaranteed interview calls from leading MNCs and startups globally.

3 Degree & Certification

Gain top-notch skills for a successful career through our degree and certification program.

1 Project Innovation Lab

Learnbay's Project Innovation Lab replicates industry like environment for real time projects. With our **ProjectLab,** you gain real proof of hands-on experience by having your project certified by the industry.

In our ProjectLab, you work like a data scientist with dedicated project mentors from industry and get certified on capstone project.

450+
Hiring Partners

PUNE

1-1 Doubt Session

HYDERABAD

Capstone Project Certificate from IBM

35k
Trusted Learners

DELHI

BENGALURU

Project Innovation Labs across India

2 Career Service PRO

Get 3 years of Job and Placement support

Unleash your career potential with unlimited job access, interview support, and profile review.

6 Mock Interviews with Industry Experts

Master the art of cloud computing, devops and stay ahead of the curve with mockups and industry insights

Resume Building Session

Craft a powerful resume showcasing your expertise in software development to stand out from the competition

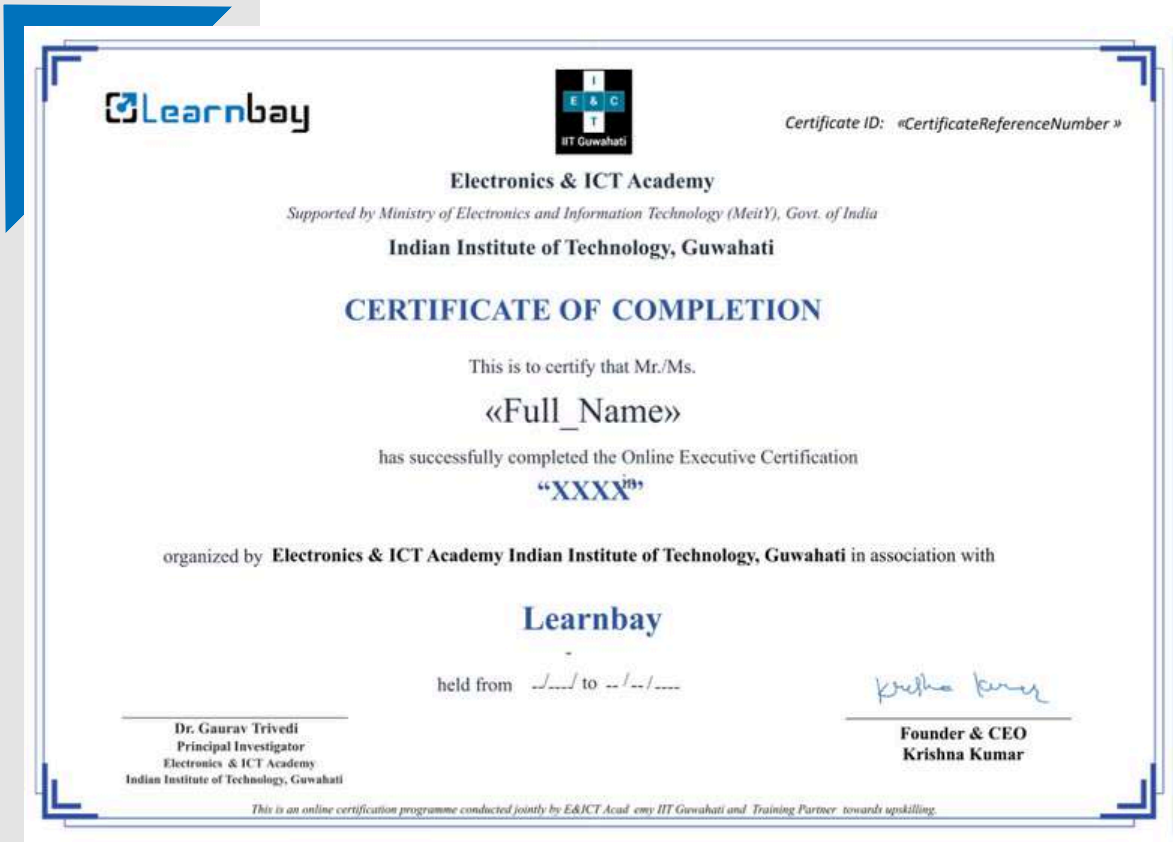
1:1 LinkedIn Review Session

Get 1-on-1 sessions with experts for a better understanding of LinkedIn profile reviews and cover letter.

Dedicated Placement Cell

Receive unlimited interview calls from a diverse pool of interested employers/recruiters until you successfully secure a job

3 Certificates



Learnbay

IIT Guwahati

Certificate ID: «CertificateReferenceNumber »

Electronics & ICT Academy

Supported by Ministry of Electronics and Information Technology (MeitY), Govt. of India

Indian Institute of Technology, Guwahati

CERTIFICATE OF COMPLETION

This is to certify that Mr./Ms.

«Full_Name»

has successfully completed the Online Executive Certification

"XXXX"

organized by **Electronics & ICT Academy Indian Institute of Technology, Guwahati** in association with

Learnbay

held from --/---/ to --/--/----

Dr. Gaurav Trivedi
Principal Investigator
Electronics & ICT Academy
Indian Institute of Technology, Guwahati

Founder & CEO
Krishna Kumar

This is an online certification programme conducted jointly by E&ICT Academy IIT Guwahati and Training Partner towards upskilling.

E&ICT IIT Guwahati Certificate

Add On-

IBM

Your Name

Course Name

IBM Developer Skills Network

Learnbay Data Science And AI

April 05, 2022

Sample Certificate

IBM Project Certificate

Microsoft Certified

Azure AI Fundamentals

Name

Azure AI Fundamentals

Microsoft

FUNDAMENTALS

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Microsoft Project Certificate

Program Fee & Financing

Scholarship

Scholarships are awarded based on profile review. Eligible candidates can avail upto 25% scholarship on desired courses. Click the button below to apply.

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Financing as low as

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Program Fee

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Others Vs Learnbay

Benefits	Learnbay	Others
Guaranteed Interview Calls	✓	✗
Industry Capstone Project Certificate from IBM	✓	✗
Domain Specialized Programs for Professionals	✓	✗
100% Live Interactive Sessions with Industry Experts	✓	✗
On-Demand Video Call with Industry Experts	✓	✗
Personalised Resume Review Session	✓	✗

Meet Our Expert Instructor

Meet **Abhishek Gupta**, our principal trainer with over **8 years of experience!** Not only has he excelled in top tech firms, but he has also dedicated the last 5+ years to teaching. Abhishek Gupta will guide you through the complexities of Data Science, ensuring you're fully prepared for tackling the industry's challenges with ease.

Program Syllabus

TERM 1

Python Programming

Module 1 (50 hours)

Programming Basics & Environment Setup

- Installing Anaconda, Anaconda Basics and Introduction
- Get familiar with version control, Git, and GitHub.
- Basic GitHub Commands.
- Introduction to Jupyter Notebook environment. Basics Jupyter Notebook Commands.
- Programming language basics

Strings, Decisions & Loop Control

- Working With Numbers, Booleans and Strings, String types and
- Formatting, String operations Simple if Statement, if-else Statement
- if-elif Statement.
- Introduction to While Loops, for
- Loops, Using continue and break
- **Class Hands-on:**
  6 programs/coding exercises on a string, loop and conditions in the classroom

Functions And Modules

- Introduction To Functions
- Defining & Calling Functions
- Functions With Multiple Arguments

Python Programming Overview

- Python Overview
- Python 2.7 vs Python 3
- Writing your First Python Program
- Lines and Indentation, Python Identifiers
- Various Operators and Operator's Precedence
- Getting input from Users, Comments, Multiple Comments

Python Data Types

- List, Tuples, Dictionaries
- Python Lists, Tuples, Dictionaries Accessing Values, Basic
- Operations Indexing, Slicing, and
- Matrixes Built-in Functions &
- Methods Exercises on List, Tuples And Dictionary

Functions And Modules

- Anonymous Functions - Lambda
- Using Built-In Modules, User-Defined Modules, Module Namespaces,
- Iterators And Generators

Class Hands-on:
8+ Programs to be covered in the class of functions, Lambda, modules, Generators, and Packages.

Program Syllabus

TERM 1

Python Programming

Module 1

File I/O And Exceptional Handling and Regular Expression

- Opening and Closing Files
- Open Function, File Object Attributes
- close() Method, Read, write, seek.
- Exception Handling, try-finally Clause
- Raising an Exceptions, User-Defined Exceptions
- Regular Expression- Search and Replace
- Regular Expression Modifiers
- Regular Expression Patterns

Class hands-on :

- 10+ Programs to be covered in class from File IO, Reg-ex, and exception handling.

Data Analysis Using Pandas

- Pandas : Introduction to Pandas
- Importing data into Python
- Pandas Data Frames, Indexing Data Frames ,Basic Operations With Data frame, Renaming Columns, Subsetting and filtering a data frame.

Data Analysis Using Numpy

- Introduction to Numpy. Array Creation, Printing Arrays, Basic Operation - Indexing, Slicing, and Iterating, Shape Manipulation - Changing shape, stacking and splitting of array
- Vector Stacking, Broadcasting with Numpy, Numpy for Statistical Operation

Assignment 1 (Week 2):

10 Coding exercises on Python Basics - Variables, Operators, Strings, Loops, Control Statement

Assignment 2 (Week 3):

10 Python programs and practice set on List, Tuples, Dictionaries & Matrices operations

Assignment 3 (Week 4):

10 Coding exercises on Functions, Lambda, Input-Output, File and Regular Expression

Program Syllabus

TERM 2

Statistics

Module 1 (30 hours)

Hypothesis Testing

- Type of Test and Rejection Region
- Type 0 errors 1 Error, Type 2 Errors. P value method, Z score Method. The Chi-Square Test of Independence.
- Regression. Factorial Analysis of Variance. Pearson Correlation Coefficients in Depth. Statistical Significance
- Null and Alternative Hypothesis One-tailed and Two-tailed Tests, Critical Value, Rejection region, Inference based on Critical Value
- **Binomial Distribution:** Assumptions of Binomial Distribution, Normal Distribution, Properties of Normal Distribution, Z table, Empirical Rule of Normal Distribution & Central Limit Theorem and its Applications

Linear Algebra

- Dot Product, Projecting Point on Axis.
- Matrices in Python, Element Indexing, Square Matrix, Triangular Matrix, Diagonal Matrix, Identity Matrix, Addition of Matrices, Scalar Multiplication, Matrix Multiplication, Matrix Transpose, Determinant, Trace
- T-Test, Analysis of variance (ANOVA), and Analysis of Covariance (ANCOVA) Regression analysis in ANOVA
- **Class Hands-on:** Problem-solving for C.L.T Problem Solving hypothesis Testing Problem solving for T-test, Z-score test case study and model run for ANOVA, ANCOVA

Data Processing & Exploratory Data Analysis

- What is Data Wrangling?
- Data Pre-processing and Cleaning?
- How to Restructure the Data?
- What is Data Integration and Transformation?

Program Syllabus

TERM 2

Statistics

Module 1

EDA

- Finding and Dealing with Missing Values.
- What are Outliers?
- Using Z-scores to Find Outliers.
- Bivariate Analysis, Scatter Plots, and Heatmaps.
- Introduction to Multivariate Analysis

Note: Problem-solving techniques and Case Studies using Statistics will be covered in class from week 2

Statistics Assignments: Total 4 Practice Sets and Assignments from Statistics

Program Syllabus

TERM 2

Machine Learning

Module 2 (40 hours)

Machine Learning Introduction

- Definition, Examples, and Importance of Machine Learning
- Definition of ML Elements: Algorithm, Model, Predictor Variable, Response Variable, Training - Test Split, Steps in Machine Learning,
- ML Models Type: Supervised Learning, Unsupervised Learning, and Reinforcement Learning

Linear Regression Model

- Comparing MAE, MSE, and RMSE. Significance of Adjusted R square.
- Overfitting and Underfitting. Bias and Variance.
- Regularization methods:
- Ridge and Lasso
- Multicollinearity, VIF. Using Python library Sklearn to create the Linear Regression Model and evaluate the model created.

Data Preprocessing

- Encoding the data: Definition, Methods: OneHot Encoding, Mean Encoding, Label Encoding, Target Guided Ordinal Encoding.

Regression and Classification Models

- Definition of regression, OLS Algorithm, Sum of Squares of residuals, Gradient Descent Algorithm, Cost Function
- Evaluation Metrics for Regression Model: MAE, MSE, RMSE, R Square, Adjusted R Square

Data Preprocessing

- Types of Missing values (MCAR, MAR, MNAR), Methods to handle missing values
- Outliers, Methods to handle outliers: IQR Method, Z Method
- Feature Scaling: Definition, Methods: Absolute Maximum Scaling, Min-Max Scaler, Normalization, Standardization, Robust Scaling

Logistic Regression Model

- Definition. Why is it called the “Regression Model”?
- Sigmoid Function, Transformation & Graph of Sigmoid Function

Program Syllabus

TERM 2

Machine Learning

Module 2

Evaluation Metrics for Classification model

- Confusion Matrix, Accuracy, Misclassification, TPR, FPR, TNR, Precision, Recall, F1 Score, ROC Curve, and AUC. Using the Python library Sklearn to create the Logistic Regression Model and evaluate the model created

Decision Tree Model

- Definition, Basic Terminologies, Tree Splitting Constraints, Splitting Algorithms: CART, C4.5, ID3, CHAID
- Splitting Methods:
- GINI, Entropy, Chi-Square, and Reduction in Variance
- Using the Python library Sklearn to create the Decision Tree Model and evaluate the model created

Hyperparameter Tuning

- GridSearchCV, Variable Importance.
- Using Python library Sklearn to create the Random Forest Model and evaluate the model created.
- Use Cases

K Nearest Neighbours Model

- Definition, Steps in KNN Model, Types of Distance: Manhattan Distance, Euclidean Distance, 'Lazy Learner Model'.
- Confusion Matrix of Multi-Class Classification
- Using the Python library Sklearn to create the K Nearest Neighbours Model and evaluate the model

Random Forest Model

- Ensemble Techniques: Bagging/Bootstrapping & Boosting.
- Definition of Random Forest, OOB Score
- K-Fold Cross-Validation

Naive Baye's Model

- Definition, Advantages, Baye's Theorem Applicability, Disadvantages of Naive Baye's Model, Laplace's Correction, Types of Classifiers: Gaussian, Multinomial and Bernoulli
- Using Python library Sklearn to create the Naive Baye's Model and evaluate the model created

Program Syllabus

TERM 2

CASE STUDY

Module 2

- Business Case Study for Kart Model
- Business Case Study for Random Forest
- Business Case Study for SVM
- To Classify an Email as Spam or Not Spam using Logistic Regression
- Application of Linear Regression for Housing Price Prediction

Program Syllabus

TERM 2

Machine Learning

Module 2 (40 hours)

K Means and Hierarchical Clustering

- Definition of Clustering, Use cases of Clustering
- K Means Clustering Algorithm, Assumptions of K Means Clustering
- Sum of Squares Curve or Elbow Curve

Hierarchical Clustering

- Dendrogram, Agglomerative Clustering, Divisive Clustering, Comparison of K Means Clustering and Hierarchical Clustering
- Using Python library Sklearn to create and evaluate the clustering model

Principal Component Analysis(PCA)

- Definition, Curse of Dimensionality, Dimensionality Reduction Technique, When to use PCA,
- Use Cases
- Steps in PCA, EigenValues and EigenVectors, Scree Plot.
- Using Python library Sklearn to create Principal Components

Support Vector Machine(SVM)

- Model: Definition, Use Cases, Kernel Function, Aim of Support Vectors, Hyperplane, Gamma Value, Regularization Parameter
- Using Python library Sklearn to create and evaluate the SVM Model

Summary of all Machine Learning Models and Discussion about the Capstone Project

Note: All Machine Learning Algorithms are covered in depth with real-time case studies for each algorithm. Once 60% of ML is completed, the Capstone Project will be released for the batch.

Program Syllabus

TERM 2

CASE STUDY

Module 2

- Recommendation Engine for e-commerce/retail chain
- Twitter Data Analysis using NLP

Program Syllabus

TERM 3

SQL

Module 1 (10 hours)

SQL and RDBMS

- RDBMS And SQL Operations.
- Single Table Queries - SELECT, WHERE,
- ORDER BY, Distinct, And, OR
- Multiple Table Queries: INNER, SELF,
- CROSS, and OUTER, Join, Left Join, Right
- Join, Full Join, Union

NoSQL, HBase & MongoDB

- NoSQL Databases
- Introduction to HBase
- HBase Architecture, HBase
- Components, Storage Model of HBase
- HBase vs RDBMS
- Introduction to Mongo DB, CRUD
- Advantages of MongoDB over RDBMS

Programming with SQL

- Mathematical Functions
- Variables
- Conditional Logic
- Loops
- Custom Functions
- Grouping and Ordering

Advance SQL

- Advance SQL Operations
- Data Aggregations and summarizing the data
- Ranking Functions: Top-N Analysis
- Advanced SQL Queries for Analytics

JSON Data & CRUD

- Basics and CRUD Operation
- Databases, Collection & Documents
- Shell & MongoDB drivers
- What is JSON Data
- Create, Read, Update, Delete
- Finding, Deleting, Updating, Inserting Elements
- Working with Arrays
- Understanding Schemas and Relations

Programming with SQL

- Partitioning
- Filtering Data
- Subqueries

Program Syllabus

SQL | **Module 1**

Assignments

- Working with Multiple Tables
- Practice Joins, Grouping, and Subqueries
- Using GROUP BY and HAVING Clauses
- Practice Aggregation Queries

Program Syllabus

TERM 3

MongoDB

Module 2 (10 hours)

Introduction to MongoDB

- What is MongoDB
- Characteristics and Features
- MongoDB Ecosystem
- Installation process
- Connecting to MongoDB database
- Introduction to NoSQL
- Introduction of MongoDB module
- What are Object Ids in MongoDB

Assignment

- Obtain the data in the format you want by formulating queries that are both effective and high-performing.

MongoDB (Advance)

- MongoDB Use cases
- MongoDB Structures
- MongoDB Shell vs MongoDB Server
- Data Formats in MongoDB
- MongoDB Aggregation Framework
- Aggregating Documents
- Working with MongoDB Compass & exploring data visually
- Understanding Create, Read, Update, Delete
- Schemas & Relations
- Document Structure
- Working with Numeric Data
- Working on Scheme Designing

Tools covered

mongoDB

Program Syllabus

Tableau

Module 3 (14 hours)

Introduction to Tableau

- Connecting to data sources
- Creating dashboard pages
- How to create calculated columns for different charts

Dashboard and Stories

- Working in views with dashboards and stories
- Working with sheets
- Fitting sheets
- Legends and quick filters
- Tiled and floating layouts, floating objects

Hands-on Assignments

- Connecting data source and data cleansing
- Working with various charts
- Deployment of predictive model in visualization

Visual Analytics

- Getting Started With Visual
- Analytics Sorting and grouping
- Working with sets, set action
- Filters: Ways to filter, Interactive Filters
- Forecasting and Clustering

Tableau (Advance)

- Mapping
- Coordinate points
- Plotting latitude and longitude
- Custom geocoding
- Polygon maps
- WMS and background image

Tools covered

Program Syllabus

TERM 3

Power BI

Module 4 (14 hours)

Getting Started With Power BI

- Installing Power BI Desktop and Connecting to Data
- Overview of the Workflow in Power BI Desktop
- Introducing the Different Views of the Data Mode
- Query Editor Interface
- Working on Data Model

Assignments

- Create Bar Charts
- Create Pie Charts
- Create Tree Maps
- Create Donut Charts
- Create Waterfall Diagrams
- Creating Table Calculations for Gender

Programming with Power BI

- Working with Time Series
- Understanding Aggregation and Granularity
- Filters and Slicers in Power BI Maps
- Scatterplots and BI Reports
- Connecting Dataset with Power BI
- Creating a Customer Segmentation Dashboard
- Analyzing the Customer Segmentation Dashboard

Tools covered

Program Syllabus

TERM 3

Big Data & Spark Analytics

Module 5(14 hours)

Introduction To Hadoop & Big Data

- Distributed Architecture - A Brief Overview. Understanding Big Data
- Introduction To Hadoop, Hadoop Architecture
- HDFS, Overview of MapReduce Framework
- Hadoop Master: Slave Architecture
- MapReduce Architecture
- Use cases of MapReduce

Getting to know PySpark

- Pyspark Introduction
- Pyspark Environment Setup
- pySpark - Spark context
- RDD , Broadcast and Accumulator
- Sparkconf and Sparkfiles
- Spark MLlib Overview Algorithms and utilities in Spark Mlib

What is Spark

- Introduction to Spark RDD
- Introduction to Spark SQL and Data frames
- Using R-Spark for machine learning Hands-on: Installation and configuration of Spark
- Using R-Spark for machine learning programming

Hands-on

- Map reduce Use Case 1: Youtube data analysis
- Map reduce Use Case 2: Uber data analytics
- Spark RDD programming
- Spark SQL and Data frame programming

Tools covered

Program Syllabus

TERM 4

Deep Learning Using Tensorflow Module 1 (20 hours)

Introduction to Deep Learning And TensorFlow

- Neural Network
- Understanding Neural Network Model
- Installing TensorFlow
- Simple Computation, Constants, and Variables
- Types of file formats in TensorFlow
- Creating A Graph – Graph Visualization
- Creating a Model – Logistic Regression
- Model Building using tensor flow

TensorFlow Classification Examples

- Introduction to TensorFlow
- Installing TensorFlow
- Simple Computation, Contents
- and Variables
- Types of file formats in TensorFlow
- Creating A Graph - Graph Visualization
- Creating a Model - Logistic Regression Model Building
- TensorFlow Classification Examples

Understanding Neural Networks With TensorFlow

- Basic Neural Network
- Single Hidden Layer Model
- Multiple Hidden Layer Model
- Backpropagation – Learning Algorithm and visual representation
- Understand Backpropagation – Using Neural Network Example
- TensorBoard

Project

- Building a CNN for Image Classification
- Project on backpropagation using Neural Networks with Tensor Flow

Convolutional Neural Network (CNN)

- Convolutional Layer Motivation
- Convolutional Layer Application
- The architecture of a CNN
- Pooling Layer Application
- Deep CNN
- Understanding and Visualizing a CNN

Tools covered

TensorFlow

Program Syllabus

TERM 4

Deep Learning Using Tensorflow — Module 1

Introducing Recurrent Neural Networks skflow: RNNs in skflow

- Application use cases of RNN
- Manual Creation of RNN Long Short-Term Memory (LSTM) And GRU theory Restricted Boltzmann Machine(RBM)
- Autoencoders Collaborative Filtering with RBM Dimensionality Reduction with Linear Autoencoder

Understanding Of TFLearn APIs

- Getting Started With TFLearn High-
- Level API usage -Layers
- Built-in Operations
- Training and Evaluation- Customizing the Training Process
- Visualization APIs Sequential And Functional Composition Fine-tuning
- Using TensorBoard with TFLearn

Understanding Keras API for implementing Neural Networks

- Getting Started With Keras APIs Keras Model
- Sequential And Functional Model, shared layers
- Composing a Model with Keras API
- Batch Normalization
- Tensor Board With Keras
- Installing Pytorch Matrices
- Torch to NumPy Bridge
- Variables, Gradients.
- PyTorch Autograd Module
- Linear Regression With PyTorch
- Logistic Regression With Pytorch

CNN in PyTorch

- Use PyTorch to build CNN
- Build RNN with PyTorch
- LSTM in PyTorch
- LSTM from CPU to GPU in PyTorch

Real-Time Project

- SPAM Prediction using RNN
- Image Classifier using PyTorch

Tools covered

PyTorch

Keras

Program Syllabus

TERM 4

Natural Language Processing | **Module 2 (40 hours)**

Natural Language Processing

- Text Analytics
- Introduction to NLP
- Use cases of NLP algorithms
- NLP Libraries
- Need for Textual Analytics
- Applications of NLP
- Word Frequency Algorithms for NLP Sentiment Analysis

Text Analysis

- Distance Algorithms used in Text Analytics
- String Similarity
- Cosine Similarity Mechanism - The similarity between two text documents
- Levenshtein distance - measuring the difference between two sequences

Important

- Applications of Levenshtein distance
- LCS(Longest Common Sequence)
- Problems and solutions, LCS Algorithms

KNN

- Information Retrieval Systems
- Information Retrieval - Precision, Recall,F- score TF-IDF
- KNN for document retrieval
- K-Means for document retrieval
- Clustering for document retrieval

Use cases on NLP

- Sentiment analysis for marketing
- Toxic comments classification
- Language identification
- Generating research papers titles
- Application to translate and summarize the news
- RESTful API for similarity check

Program Syllabus

TERM 4

Natural Language Processing

Module 2

Text Pre Processing Techniques

- Need for Pre-Processing
- Various methods to Process the Text data
- Tokenization, Challenges in Tokenization
- Stopping, Stop Word Removal

Stemming

- Stemming - Errors in Stemming
- Types of Stemming Algorithms - Table
- Lookup Approach
- N-Gram Stemmers

CASE STUDY

- **Sentiment Analysis for Twitter, Web Articles**
- **Movie Review Prediction**
- **Summarization of Restaurant Reviews Topic**
- **Modelling & Dirchlett Distributions**
- **Introduction to Topic Modelling**
- **Latent Dirichlet Allocation**
- **Advanced Text Analytics & NLP**
- **Introduction to Natural Language Toolkit POS**
- **Tagging**
- **NER (Named Entity Recognition)**

Program Syllabus

TERM 4

Computer Vision | **Module 3(24 hours)**

Computer Vision overview

- Historical Perspective
- Introduction to the four R's of Computer Vision
- OpenCV Installation
- Python API Drawing shapes
- Image Processing
- Image Rotation and Thresholding

Image Processing

- Histogram equalization
- Thresholding and Convolution
- Sharpening and edge detection
- Morphological transformations
- Image pyramid
- Contour properties
- Circle detection
- Line detection
- Watershed segmentation

Project

- AI-Based Live Face Identification System for Crowd
- Single Shot MultiBox Detector
- Object Localization
- Find an object in an image

Image Filtering

- Gaussian Blur
- Median Blur Feature Detection - Canny Edge Detector
- Use of Neural Network in CV
- Multi-Layer Perceptron

Image Classification and segmentation

- Data-Driven approach
- K-nearest Neighbor
- Linear Classification
- Contours and segmentation

Project

- The Problem of Scale and Shape
- Haarcascade - face and eye detection

Real time use cases:

- Single Shot MultiBox Detector
- Object Localization
- How would you find an object in an image
- The Problem of Scale and Shape SSD in Tensorflow
- Haar cascade - face and eye detection

Program Syllabus

TERM 4

Reinforcement Learning

Module 4(14 hours)

What is Reinforcement Learning - Basics

- Setting up Environment & Installing OpenAI Gym.
- OpenAI Gym Basics.
- Terminology & Environment.
- Dynamic Programming - Prediction, Control, and Value Approximation.
- Building Blocks of Reinforcement Learning
- OpenAI Gym Tutorial Random Search
- Markov Decision Processes
- Monte Carlo Methods

Projects and Case Studies

- Solving Taxi Environment
- Solving Frozen Lake Environment
- Reward Discounting

Approximation Methods for Reinforcement Learning

- RBF Networks with CartPole
- TD Lambda and Policy Gradient Algorithms.
- Temporal difference learning. N-Step Methods
- TD lambda, Policy Gradient Methods Policy Gradient in TensorFlow for CartPole. Mountain Car Continuous using Tensorflow

Important:

- Deep Q-Learning Techniques
- Deep Q-Learning in Tensorflow for CartPole

Program Syllabus

TERM 4

Model Training & Deployment using (AWS GCP) **Module 5 (10 hours)**

AWS (Amazon Web Services)

- Deployment Strategies
- Automations
- Monitoring and Logging
- Communication and Collaboration

GCP (Google Cloud Platform)

- GCP Development Tools - Cloud SDK, Repositories, Plugins
- Deployment Manager and Cloud Endpoint

Deploying Machine Learning Model

- Deploying Models, Understanding training graphs and serving graphs
- Check and adjust model size
- Build an optimal prediction graph
- Creating input function
- Creating a model version
- Getting Online Prediction

Introduction to AWS and GCP Cloud ML Engine

- CloudML Engine & AWS in Machine Learning WorkFlow
- Components of AWS & Cloud ML Engine
- GCP and AWS Console.
- gcloud command-line tool and Rest API

Training Machine Learning Model

- Developing a trained model application
- Running and monitoring a machine learning model
- Using hyperparameter tuning
- Using GPUs for training models in the cloud

Tools covered

aws

Google Cloud

Program Syllabus

TERM 5

Project Management Module | **Essentials (70 hours)**

Jira process

- Agile Delivery and Scrum DevOps
- Project Management
- Release Management Process
- Service Now
- Meetings/Emailing
- Communication with various workstreams
- Change Management
- Resource Management
- Stakeholder Management
- Risk analysis to improve outcomes
- **Risk Management**
- RAID log
- Realistic time estimates
- Project Charter
- Co-create a project task outline and schedule
- Status Tracking
- Project Management
- Agile Project Management
- **Project Management Cycle**

Agile

- Agile Delivery and Scrum
- Agile & Scrum in a nutshell
- Lifecycle of a Scrum-based project
- Scrum Roles
- Scrum: Sprint Lifecycle (Ceremonies)
- Scrum Artefacts
- Business Requirements

PM approaches for Technical Projects

- Managing Technical solutions
- PM Tips
- Plan on a Page (POAP)
- Roadmap Project Planning
- Detailed Project plan
- Project Management Tool (MPP)
- Case studies
- Certification guidance

JIRA Process

- What & Why Jira
- Delivery Process enabling
- Getting access & requesting a new project on Jira
- Adding team members to your Jira Project
- Navigating Jira
- Jira Issue Types
- Jira Training Assets
- Jira Reports

Program Syllabus

BONUS

AI Generative Tools and Future Trends

Emerging Trends in AI and Generative Modeling

- Exploring other AI generative tools beyond ChatGPT and DALL·E
- Overview of Midjourney
- Discussion on future trends and advancements in AI generative tools
- Open-ended project and/or presentation on a selected topic, incorporating learned concepts

Natural Language Processing and ChatGPT

- Introduction to natural language processing techniques
- Understanding ChatGPT and its architecture
  Hands-on exercises using ChatGPT for text generation
- Fine-tuning ChatGPT for specific applications

Midjourney Bing ChatGPT DALL·E Bard

DALL·E: Image Generation with AI

Exploring image generation using DALL·E

- Hands-on exercises for creating unique images with DALL·E
- Ethical considerations and limitations of AI-generated images

Graph Neural Networks (GNN) for Data Analysis

- Overview of Graph Neural Networks (GNN) and their applications
- Hands-on exercises using GNN for tasks such as node classification and link prediction
- Case studies on real-world applications of GNN in data science

Program Syllabus

BONUS

Python Bootcamp for AI

- Python Essentials: Syntax, Data Types, and
- Variables Flow Control: Conditionals and Loops

Build Your Interview Assistant

- Project Overview: Interview Automation Bot
- Components & Architecture
- Natural Language Models (LLMs): Introduction and Uses

Large Language Models (LLM

- Historical Overview of NLP: From Rule-Based Systems to Machine Learning.
- Evolution of Neural Network Architectures in NLP.

Visual AI for eCommerce

- Introduction: Digital Transformation for Offline Businesses
- Multimodal Models: DALL-E and Beyond
- Style & Photography Principles for Visual AI

Intelligent News Aggregator

- Project Outline: Personalized News Recommendation
- GPT-3 & Copilot for Code Automation

Program Syllabus

BONUS

Customer Support Bot - HelpMate Pro

- Project Introduction and Components
- Embeddings vs Fine-Tuning: When and How
- Semantic Search in Customer Service

Knowledge Discovery Bot

- Project Overview and Architecture LangChain
- Tools and Concepts

Azure OpenAI Integration

- OpenAI on Azure: Services and Scalability
- Revisiting HelpMate Pro: Scaling Strategy

The Future & Ethics of Generative AI

- Responsible AI: Bias and Fairness
- Future Trends: Multimodal Models and RLHF Closing Remarks
- Assessment: MCQ

Capstone Project (3 Weeks)

- Building an Integrated Prompt Engineering Solution
- Project Submission and Peer Review

Real-time Projects

J.P.Morgan

12 hours

Learn and develop classification techniques for the digital transformation of banking

JPMorgan offers tax-friendly insurance choices. You can help them forecast insurance premiums. Targeted marketing using your Random Forest Algorithm skills can help obtain better premium values.

python pandas scikit-learn

NETFLIX

17 hours

Building a content recommendation model on the basis of regional viewer categorization

Netflix is a global entertainment video streaming site. They offer content in various regional languages. Build a local recommendation engine for Netflix customers residing in south Bangalore on their weekend and weekday activities, utilizing NLP.

NumPy SQL jupyter

OLA

18 hours

Reduction of waiting time via a highly precise forecasting model

Make a demand forecasting model based on specific time period rider demands. Such a model will help both riders and cab drivers to ensure the least possible waiting time. You can include measures like latitude and longitude identification.

python TensorFlow APACHE Spark

أرامكو السعودية saudi aramco

14 hours

Understanding in-depth about logging while drilling (LWD) technique

Saudi Aramco company is working on the development of high-efficiency drilling models. Use the bright sides of big data analytics to identify the most cost- effective and highly productive drilling sites.

hadoop matplotlib aws

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