



The future of AI is here!!



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Innovation Labs USA, and Vikrant Group of Institutions, Gwalior & Indore, MP India, collaborated to bring Artificial Intelligence and Machine Learning education to the students in India.

**International Diploma
in
Artificial Intelligence**

FLEX

12 Months

**International Diploma
in
Machine Learning**

FLEX

12 Months

**Certificate in Artificial
Intelligence
For Business Executives**

FLEX

3 Months

**Python Programming
for
Data Science**

FLEX

3 Months

<http://innovationlabs.ai/#/VikrantGroupIndia>

International Diploma **in** **Machine Learning**



International Diploma in Machine Learning

Program Details

MODULE PROGRAM DETAILS

- Duration:
 - STANDARD** 6 Months
 - EXPRESS** 3 Months
 - FLEX** 12 Months
- Language/Medium: English
- Minimum Qualification
 - Graduate or Post Graduate in Science, Mathematics or similar discipline
 - Student can get diploma while in their regular class system
- Entrance:
 - Based on written entrance exam followed by interview
- Certification
 - Course is conducted & supervised by an Educational Institution
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 - 20% lectures and 80% project work
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Total Modules

- Total Modules: 6
- Each Module: 33% time of allotted time
- Progress Report: Twice every module
- Workshop: 2 Per Module
- Final Report: End of Module

Individual Module Exercises

- Reporting:
 - Code, Share, Team Progress
- Content Sharing
 - GitHub , YouTube/Blog
- Review:
 - Team, Peer and Innovation Lab
- Scoring:
 - Self, Peer, Innovation Lab

Branding and Marketing yourself

- During the year student will learn how to build their technical brand and market them to win competition

Industry sponsored Project - (30 Days)

- Project information will be provided at the time of course completion

1

MODULE - ONE

- 1.1 Intro to Business and Data
 - Understanding Business Data
 - Introduction to BI, Analytics
 - Data Reporting
 - Data Processing and Machine Learning
 - Machine Learning Adoption for any organization
 - Machine Learning Pipeline
- 1.2 Introduction to Python
 - Python
 - Jupyter
- 1.3 Python Modules
 - Variables/Operators
 - Strings
 - Condition & Loop
 - Functions
 - List/Tuples
- 1.4 Python for Data Science
 - Pandas
 - NumPy
- 1.5 Introduction of Python and R based ML tools
 - R and R-Studio
 - Scikit-Learn
- 1.6 Introduction to Machine Learning Tools
 - H2O from H2O.ai
 - KNIME Analytics Platform

Module Project

- Large Data Processing in Python
- Creating Infographics from Data
- Understanding business problems

Sponsored Project

- Identify the problem
- Work in team and solving the problem
- Results verification and review

Branding Project

- Introduction to Self Branding
- What is self branding
- Creating your own brand
- Establishment of your own brand with regular Improvement

2

MODULE - TWO

- 2.1 Statistics for ML
 - Mean/Median/Mode
 - Skewness, Variance/Co-variance
 - Correlation & Standard Error
 - Distribution/Standard Distribution
- 2.2 Introduction to H2O
 - Data Importing and understanding into H2O
 - Tool based machine learning with KNIME
- 2.3 Machine Learning Fundamentals
 - Business and technical Introduction
 - Type of machine learning problems
 - Understanding data for machine learning
- 2.4 Machine Learning
 - Supervised Machine Learning
 - Binary and Multinomial Classification
 - Linear and Logistic Regression
- 2.5 Data Graphics with Python
 - Library: matplotlib, seaborn
 - Histogram, Bar/Line
- 2.6 Introduction to Competitive Machine Learning
 - What is Competitive Machine Learning?
 - Preparing and participating
 - Joining Kaggle
- 2.7 Formulating a problem to solve with machine learning
 - Creating a Hypothesis from data
 - Testing a hypothesis

Module Project

- Iris, AutoMPG and Prostate Dataset
- Titanic Survival Problem
- Boston Housing related experiment

Sponsored Project

- Identify the problem
- Change the team and role
- Results verification and peer review

Branding Project

- Brand Establishment Tools
- Social Networks and Branding
- Brand (Self = Brand) Placement and Marketing

3

MODULE - THREE

- 3.1 Model Parameters and Improvement
 - Understanding Overfitting and Underfitting
 - Cross Validation
 - Hyperparameter and Grid-Search
 - Model Parameters (Classification and Regression)
 - Model Results : False Positives and Negatives
 - Model Results : Precision & Recall, Lift
- 3.2 Understanding ML models
 - Scikit Models
 - H2O Binary and MOJO Models
 - Understanding Scoring Pipeline
 - Building Scoring Pipeline with H2O MOJO Models
- 3.3 Understanding Linear Model
 - GLM Fundamentals
 - Handling GLM Parameters
- 3.4 Understanding Tree based Models
 - Decision Tree Algorithms
 - GBM Algorithm
 - Random Forest Algorithm
 - Handling GBM Parameters
 - Handling Random Forest Parameters
 - Distributed Random Forest in H2O
- 3.5 Feature Engineering
 - Understanding Correlation
 - Various Data Transformers
 - Feature Engineering with Python
- 3.6 Unsupervised Machine Learning
 - Clustering and various Algorithms
 - Understanding K-Means Algorithm
 - K-Means in Scikit and H2O

Module Project

- Higgs Boson
- Predicting Loan Return
- Chicago Crime Data
- Alcohol consumption per country
- Wine Quality Data
- Predicting Airline Delay using Weather Data

Module Project

- Kernel Profile creation
- Creating Kaggle Kernels
- Stackoverflow and Answering Questions

Sponsored Project

- Identify the problem
- Changing the team and role again
- Results verification and peer review

Branding Project

- Blog Profile creation and start publishing
- Creating social and technical Footprint
- Building knowledge and branding on others work

4

MODULE - FOUR

- 4.1 Understanding Time-Series Data
 - Time Series Data Processing
 - Time Series Data Modeling
 - Time Series Data Validation
 - Time Series Data Constraints
 - Feature Engineering for Time Series Data
 - Building Time-Series Models in Scikit and H2O
- 4.2 Time-series Projects
 - 1. Predicting Rain
 - 2. Web Traffic Forecasting
 - 3. Weather Forecasting
- 4.3 Explainable Models
 - Machine Learning Interpretability (MLI)
 - Building MLI Models
 - MLI with K-Lime (Python)
 - Using Feature Importance, PDP Plots & Decision Trees
- 4.4 Machine Learning Interpretability (MLI) Project
 - 1. MLI with Titanic ML Problem
 - 2. MLI with Loan Prediction ML Problem
 - 3. MLI with Rain Prediction ML Problem

Module Project - 1

- Processing General Store Data
- Feature Engineering
- Building Model
- Creating Scoring Application in Python
- Explaining Model

Module Project - 2

- Processing Employee Dataset
- Feature Engineering
- Building Model
- Creating Scoring Application in Python
- Explaining Model

Sponsored Project

- Identify the problem
- Changing the team and role again
- Results verification and peer review

Branding Project

- Impactful Blog content, Online resources i.e. tech videos
- Adding and improving Kaggle Kernels
- Building knowledge and creating various tutorials

5

MODULE - FIVE

- 5.1 Natural Language Processing (NLP)
 - Processing Text for Machine Learning
 - Understanding & Implementing Word2Vec Models
 - Understand CBOW in word2vec
 - Understanding skip-gram in word2vec
 - Implementing GloVe using gradient descent and alternating least squares
- 5.2 Sentence and Paragraph modeling
 - Understanding Lda2Vec: Architecture and Libraries
 - Topic modeling with Lda2vec
 - Text Summarization in Python

Project - Building Customer Sentiment Engine

- Collecting customer feedback
- Building customer feedback dataset
- Processing feedback rating
- Processing feedback to find male or female feedback
- Finding Sentiment in the customer feedback
- Finding Duplicate or Similar Feedback
- Creating Final application in Python

Project – Text classification & Modeling

- Learning web scrapping in Python
- Creating a project to scrap data from web and create dataset
- Refining Dataset for our project
- Processing & creating features from input dataset
- Creating Final application in Python

Sponsored Project

- Identify the problem
- Changing the team and role again
- Results verification and peer review

Branding Project

- Immersive and impactful technical content creation
- Writing multiple section blog for a project in this module
- Create Tutorial Screencast for various tutorials

6

MODULE - SIX

- Introduction to Neural Networks & Deep Learning
 - Deep Learning Fundamentals
 - Neural Networks Basics
 - Understanding MNIST Problem
 - Solving MNIST Problem in Python

Create your own project - (30 Days Project)

- Define the problem
- Create a solution outline for the problem
- Solve the problem
- Build the full end to end solution in Python for your problem
- Create detailed report for your problem and its solution
- Submit the solution and finalize report

Working on Industry sponsored Project - (30 Days)

- Project information will be provided at the time of course completion

Sponsored Project

- Looking for problems at Kaggle to solve as Team
- Identifying Blood Cell Types using Image Classification
- E-commerce Store item category prediction from images

Branding Project

- Identify how your social and technical profile is being judged
- Branding Scoring
- Learning methods of winning jobs before the Interview
- Self Evaluation



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 - Introduction to BI, Analytics
 - Data Reporting
 - Data Processing and Machine Learning
 - Deep Learning Adoption for any organization
 - Deep Learning Pipeline
- 1.2 Introduction to Python
 - Python
 - Jupyter
- 1.3 Python Modules
 - Variables/Operators, Strings
 - Condition & Loop
 - Functions, List/Tuples
 - Many Others
- 1.4 Python Libraries for Machine & Deep Learning
 - Pandas
 - NumPy
- 1.5 Introduction to Deep Learning Tools
 - TensorFlow
 - Keras
 - PyTorch
 - mxnet
- 1.6 Neural Networks & Deep Learning Fundamentals
 - CNN, RNN, GAN
 - Feed Forward & Back Propagation

Solving various Machine Learning practice problems

- Predicting Loan Return
- Chicago Crime Data
- Alcohol consumption per country
- Wine Quality Data
- Predicting Airline Delay using Weather Data

Module Project

- Large Data Processing in Python
- Creating Infographics from Data
- MNIST Problem Discussion

Sponsored Project

- Identify the problem
- Work in team and solving the problem
- Results verification and review

Branding Project

- Introduction to Self Branding
- What is self branding
- Creating your own brand
- Establishment of your own brand with regular Improvement

2

MODULE - TWO

- 2.1 Statistics for Machine Learning
 - Mean/Median/Mode
 - Skewness
 - Variance/Co-variance
 - Correlation
 - Distribution/Standard Distribution
 - Standard Error
- 2.2 Introduction to TensorFlow
 - Basics and Architecture
 - Classification and Regression
 - Text Classification
 - Understanding Overfitting and Underfitting
- 2.3 Introduction to Keras
 - Creating Keras Model
 - Model Specification
 - Compiling, Fitting and Optimizing Model
 - Using Keras model and predicting results
- 2.4 Understanding Transfer Learning
 - What is Transfer Learning and how to use it
 - Using Pretrained Networks
- 2.5 Pretrained Networks - Detailed Study
 - ImageNet, VGGx, MobileNet
 - Resnet, Inception

Building Image Classification application

- Collecting Data and defining parameters
- Using various pre-training networks
- Designing image classification solution without pre-training networks
- Building image classification model with small dataset

Module Project

- Large Data Processing in Python
- Creating Infographics from Data
- MNIST Problem Discussion
- Cat and Dog Identification Exercise

Sponsored Project

- Identify the problem
- Change the team and role
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Branding Project

- Brand Establishment Tools
- Social Networks and Branding
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3

MODULE - THREE

- 3.1 Mathematics of Deep Learning
 - Linear Algebra & Objects
 - Matrix Manipulation
 - Normalization and Decomposition
 - Propagation & Activation
 - Optimization
- 3.2 Neural Network Models
 - Validating Deep Learning Models
 - Understanding Scoring environment and requirement
 - Creating scoring pipeline
 - Finalizing & porting Deep Learning models
- 3.3 Tensorflow.js Introduction
 - Core Concepts
 - Training on dataset and scoring with framework
 - Understanding Transfer Learning
 - Using Keras Model
- 3.4 Real Time Style Transfer using Keras
 - Going Deep into Transfer learning
 - Basics of learning from network and its application

Building image classification application with Tensorflow.js

- Project 3.1 - Processing WebCam Data
- Project 3.2 - Handwritten Digits Recognizer
- Project 3.3 - Creating human recognition application

Creating Style Transfer Project using Tensorflow.js

- Using one image style to apply on other image
- Optimizing performance
- Creating Tensorflow.js application

Application of t-SNE Visualization

- What is t-SNE and taking advantage of it
- Creating 2 visualization solutions using t-SNE

Sponsored Project

- Identify the problem
- Changing the team and role
- Results verification
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Sponsored Project

- Kernel Profile creation
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Branding Project

- Blog Profile creation and start publishing
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- Building knowledge and branding on others work

4

MODULE - FOUR

- 4.1 Deep Learning Model Optimization
 - Understanding & Diagnosing Model Optimization
 - Model Parameters and optimizing for better results
 - Early stopping, layers optimization
 - Optimizing and augmenting dataset
- 4.2 Introduction to Computer Vision with OpenCV
 - What is computer vision?
 - Using OpenCV
 - Image Processing with OpenCV
- 4.3 Time-Series dataset and forecasting with LSTM
 - Understanding Time-series Data
 - Time-series data processing and modeling basics
 - Understanding LSTM Networks and how they work
 - Collecting weather data set
- 4.4 Face Detection with Open CV
 - Concepts of Face Detection and Face Embeddings
 - Training Model
 - Recognizing Face from images and video

Creating small image processing library in Python

- Create image processing specification
- Design and Create image processing function in Python
- Developing library and optimizing for better performance

Building Weather Forecasting Engine with LSTM

- Collecting Data
- Building forecasting model
- Creating scoring application

Building Face Detection application with OpenCV

- Identify faces to recognize
- Create webcam environment
- Using Webcam stream to detect specific faces
- Create automated method to add face and then detect

Sponsored Project

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Branding Project

- Impactful Blog content, Online resources i.e. tech videos
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5

MODULE - FIVE

- 5.1 Object Detection and Segmentation
 - Fundamentals of Object Detection and Segmentation
 - Deep Learning algorithms for Object Detection and Segmentation
 - Using CovNets and TensorFlow libraries
 - Understanding YOLO, VGG-Face and TensorFlow models
- 5.2 Application of AutoEncoders in Deep Learning
 - What are AutoEncoders?
 - Various applications of AutoEncoders
 - Encoders and Decoders
- 5.3 Understanding LSTM and applying it with Keras for various applications
 - Sentiment Classification with Keras
 - Generating Text using LSTM
 - LSTM Gender Prediction
 - Classifying news topics with LSTM

Project - Object Detection Experiments

- Exercise 1.1 - Using YOLOv3
- Exercise 1.2 - Using TensorFlow Object Detection API
- Exercise 1.3 - Using VGG-Face

Project – Building AutoEncoders in Keras

- Using AutoEncoders on hand written digits
- AutoEncoders application

Project – Text classification & Modeling

- Collecting data from web
- Creating proper dataset for our project
- Using Keras to build model
- Verify model and create scoring pipeline

Project – Text classification & Modeling

- Understand the process
- Build the solution in Python
- Create a web application to apply such solution

Sponsored Project

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Branding Project

- Immersive and impactful technical content creation
- Writing multiple section blog for a project in this module
- Create Tutorial Screencast for various tutorials

6

MODULE - SIX

- 6.1 Advance Topics in Deep Learning
 - GANs
 - Autonomous Driving
 - API Based application in Deep Learning
 - Building Realtime API Infrastructure

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- Looking for problems at Kaggle to solve as Team
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- Kaggle Demand Forecasting Problem

Branding Project

- Identify how your social and technical profile is being judged
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Certificate **in** **Artificial Intelligence** **For** **Business Executives**



Certificate in Artificial Intelligence for Business Executives

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STANDARD	6 Months
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CRASH	1 Day
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1

MODULE - ONE

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 - Understanding Business Data
 - Introduction to BI, Analytics
 - Data Reporting
 - Data Processing and Machine Learning
 - Machine Learning Adoption for any organization
 - Machine Learning Pipeline
 - Master Data Management
- 1.2 What is Artificial Intelligence & Machine Learning?
 - Define technology
 - Understand similarity and difference at business level
 - Understand similarity and difference at technology level
 - Understand how and where to apply
 - AI Platforms vs. AI Solution
 - API solution for AI and ML
- 1.3 How billion dollars organization shaping AI & ML
 - Google | Microsoft | Facebook | Intel | IBM | Nvidia | Uber | Amazon
- 1.4 How Startups are shaping AI and ML
 - Investment into AI/ML in 2017/18/19
 - AI startups spearheading AI/ML product development
 - Five Startup and their business strategy
 - H2O.ai, DataBricks, + ...
- 1.5 Understanding AI and ML from business use cases
 - Healthcare | Finance & Banking | Retail | Insurance | IoT/IIoT, Smart Cities | Smart Energy | Telecom | Marketing & Social Networks
- 1.6 Various Resources to learn AI
 - FastAI | OpenAI | Data Camp, Udemy, Coursera, EDX | H2O Docs | Social Networks

Module Project : Customer Use Cases Study

- Large Data Processing for AI and ML
- Creating Infographics from Business Data
- Understanding business problems and finding tools to solve it
- Customer Churn
- Real Time Recommendation

Branding Project

- Introduction to Self Branding
- What is self branding
- Creating your own brand
- Establishment of your own brand with regular Improvement



Certificate in Artificial Intelligence for Business Executives

2

MODULE - TWO

- 2.1 Machine Learning Fundamentals
 - Business and technical Introduction
 - Type of machine learning problems
 - Understanding data for machine learning
- 2.2 Machine Learning refresher
 - Supervised Machine Learning
 - Binary & Multinomial Classification
 - Linear & Logistic Regression
 - Unsupervised Machine Learning
 - Clustering, Dimensionality Reduction and Autoencoders
- 2.3 Using Open Source for your advantage
 - How Open Source is shaping AI development
 - Top 5 Project to follow and learn from it
 - OpenAI | FastAI | TensorFlow & Keras | H2O | scikit-learn
- 2.4 Role of programming language in AI/ML
 - Java | C# | Python | Scala | R | C/C++
- 2.5 AI/ML Tools and Technology landscape
 - Statistical Machine Learning
 - With H2O, TensorFlow & Keras
 - Neural Networks and Deep Learning
 - Computer Vision and OpenCV
- 2.6 Using Analytics & Data visualization tools to learn from data
 - Excel, Tableau Public, and KNIME
- 2.7 Understanding AI/ML using business examples:
 - AI in Retail
 - Senior Comfort Care
 - Combining AI + Robotics + Medicine + Psychology to build AI solutions

Module Project : Customer Use Cases Study

- Boston Housing related machine learning experiment
- Text Classification, Identification & Summarization
- Marketing Optimization & Forecasting

Brand Establishment

- Brand Establishment Tools
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Certificate in Artificial Intelligence for Business Executives

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Module Project : Customer Use Cases Study

- Anti Money Laundering (AML)
- Know Your Customers (KYC)

Create your own project - (15 Days Project)

- Define the problem
- Create a solution outline for the problem
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Certificate in Python Programming for Data Science

1

MODULE - ONE

- 1.1 Installing Python Installing
 - Python 3 on Windows/macOS/Linux
 - Verify installation
- 1.2 Choosing a Programming Environment
 - IDE vs Editor
 - VSCode, Sublime, Atom, PyCharm basics
- 1.3 Hello World!
 - Using Interpreter
 - Inspection of Hello World program
- 1.4 Python Basics
 - Indention, Comments, Constants, Numbers,
 - Strings, Single, Double and Triple quotes
- 1.5 Formatting & Escape sequence
- 1.6 Variables and Identifiers
- 1.7 Basic Data Types - Object
- 1.8 Operators and Expressions
 - Operators
 - All operators
 - Mathematical operators in detail
 - Evaluation Order & Expressions
- 1.9 Standard Library (Some Python Standard Library modules)
 - logging module
 - math module for Mathematics
 - datetime for manipulating date/time
 - "os" module

Module Project : Application of Python

- Why Python programming is important
- Application of Python
- Building Simple Calculator in Python
- System Information Widget in Python

Branding Project

- Introduction to Self Branding
- What is self branding
- Creating your own brand
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Certificate in Python Programming for Data Science

2

MODULE - TWO

- 2.1 Standard Library Modules
 - logging module
 - re module for Regular Expressions
 - Pandas Module
 - Data Visualization with Matplotlib
- 2.2 Control Flow
 - Branching: if statement
 - Loops: for statement
 - Alternative loop: while statement
 - break and continue
 - Some notes on Algorithmic Thinking
- 2.3 Functions in Python
 - Creating a function
 - Parameters
 - Local & global variables
 - default parameter value
 - Returning value: return keyword
- 2.4 Modules in Python
 - Basic module usage
 - Byte-compiled .pyc file usage
 - from...import statements
 - Name of a module: __name__
 - Create your first module
 - using your module
 - dir & packages
- 2.5 Basic Data Structures
 - List, Tuple, Dictionary, Sequence, Set

Module Project : Data Processing

- Processing Various Dataset using Pandas
 - Boston Housing, Titanic
 - Iris, Prostate, Higgs Boson
 - Instacart Dataset Study
- Creating Data visualization graphs with Matplotlib

Brand Establishment

- Brand Establishment Tools
- Social Networks and Branding
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Certificate in Python Programming for Data Science

3

MODULE - THREE

- 3.1 Standard Library Module
 - Data Visualization in Python
 - Seaborn and Plotly
 - Data Management in Python
 - NumPy & Pandas
 - Other useful Libraries and Modules
- 3.2 Input and Output
 - Capturing user input
 - Using files
 - Saving Python objects to file: Pickle
 - Working with non-English characters: Unicode
- 3.3 Object Oriented Programming
 - What is Class, Object and Instance
 - Fields, Methods and attributes
 - Instance Variables vs. Class Variables
 - Specific variable: self
 - Classes in details
 - Methods
 - `__init__` method for initializing
 - Class and Object variables
 - Inheritance
 - Definition, Base class/Superclass
 - Derived class/Subclass Multiple Inheritance
- 3.4 Exceptions
 - Errors, Handling Errors through Exceptions
 - Raising Exceptions to be handled
 - try...finally block and with block

Module Project : Customer Visible Projects

- Data Management & Reporting in Python
- Data Science Application in Python
- Chicago Crime Data set study
- Airline Delay project Study

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Top 10 reasons to choose Innovation Labs International Diploma & Certificate Programs

1. Course created by AI and ML professionals

First of all our course content is created and curated by AI and machine learning Industry Professionals, who has been in the AI and Machine learning industry for several years now. The AI and machine learning course content is based on Projects which are taken directly from industry requirement.

2. Learning through real life business projects

The learning in the class is totally based on project work with emphasis on learning while work. While completing the project, students will learn necessary fundamentals as well as background knowledge about it.

3. Classes are like on the job internship

Our course structure is designed exactly like an on the job Internship. Students will learn everything they needed for the job in the class room and build necessary character and knowledge base for their next job.

4. Focus on independent and team-based study

The class is divided into 80% independent and team-based study while remaining 20% time is dedicated for learning from online lectures, face to face discussion with instructors, and class room study.

5. Regular feedback process for improvements

We believe the value of feedback while learning so our electronic learning system will be providing timely feedback on regular basis to improve and enhance the content.

6. Cross courses collaborative study

We focus on team based study and cross collaboration means within the organization and cross organization teams with same courses will work together to learn from each other and share their knowledge.

7. Focus on leadership and partnership in class

While learning, the students will work in different teams and will have opportunity to lead, participate and manage projects, to simulate real job environments.

8. Working on real business projects in class

During the course our emphasis in on quality of learning in the small portion of complete projects which will prepare students for the actual jobs. We will be bringing real projects from our partner organizations and after the completion the students will have

9. Individual performance boost while in team

We also believe in individual performance while working in team environments, so our curriculum is designed such a way so that each student has opportunity to perform their best while working in team environment.

10. Global placement option for top performers

We do have global placement options for the top performance candidates which means you have higher probability of getting Job into AI and machine learning industry. The students will have to complete all the assigned directives and perform their best to achieve placement criteria.



The future of AI is here!!



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