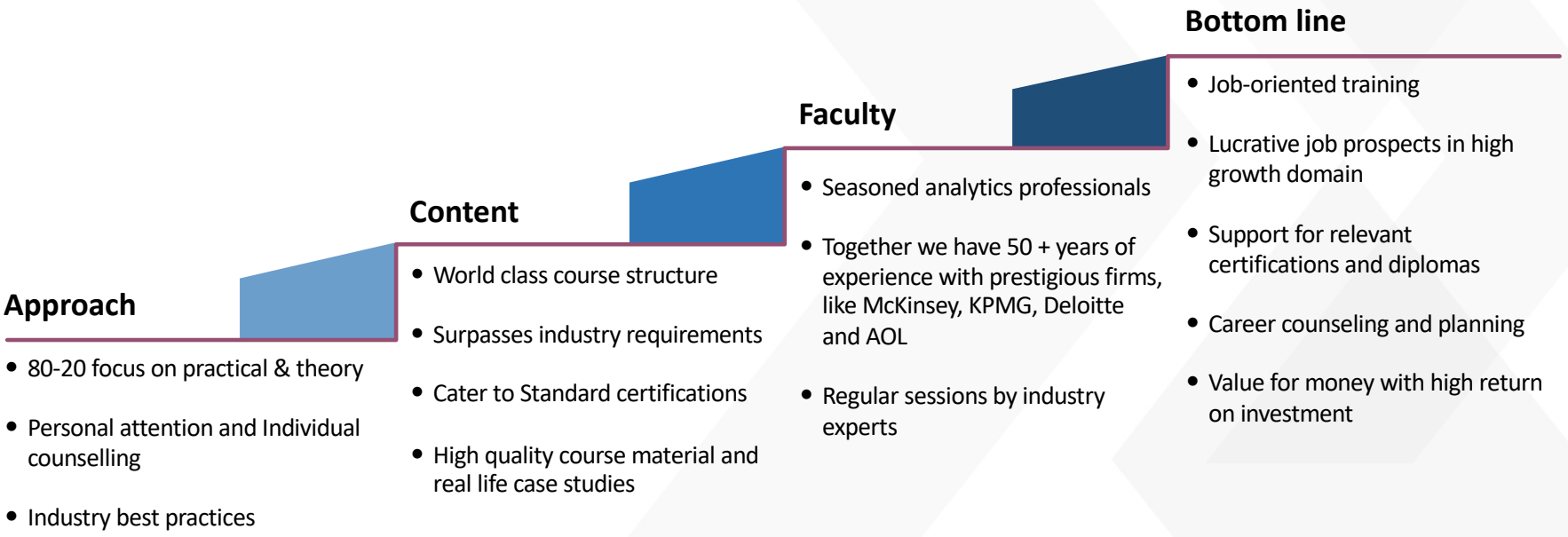
ANALYTIXLABS

Full Stack Data Science with AI ML Specialization

Job oriented global certification program crafted by experts

About AnalytixLabs

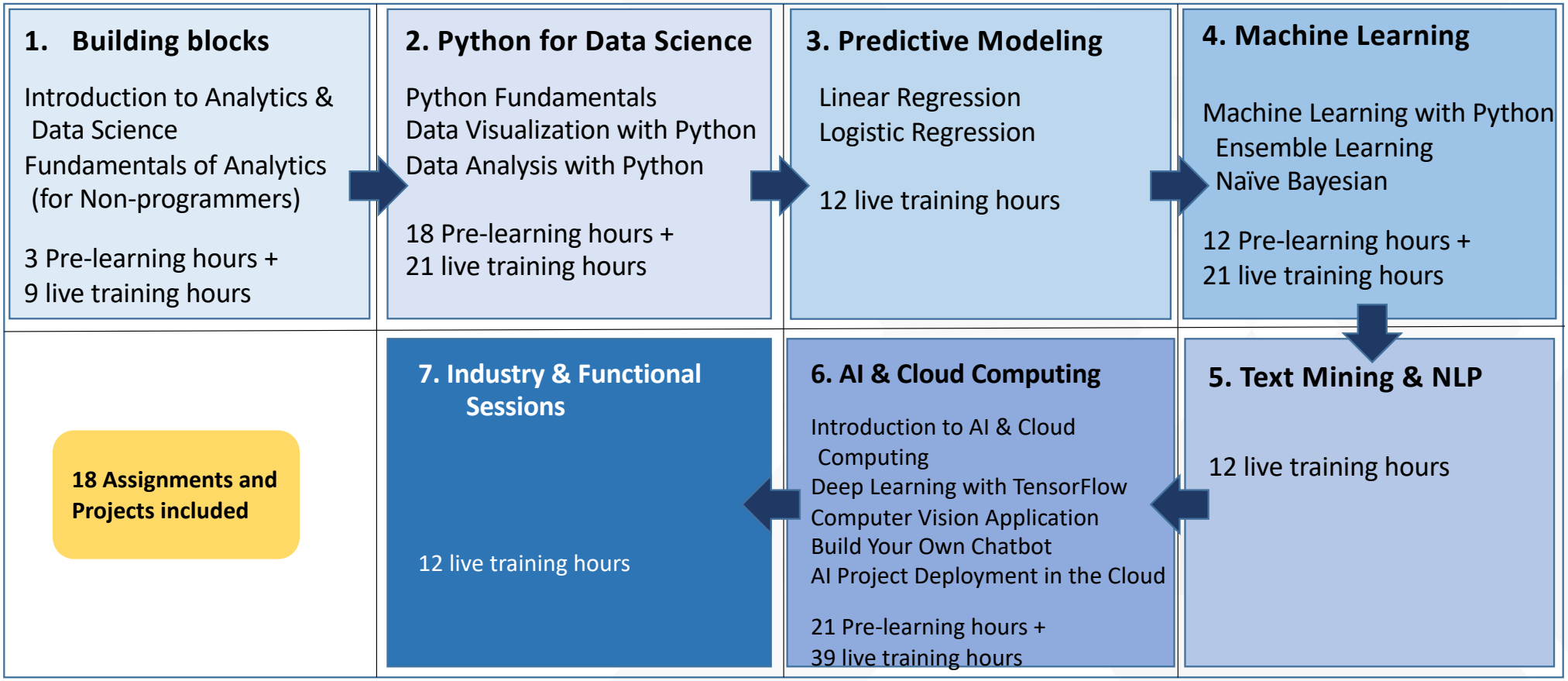
AnalytixLabs is a capability building and training solutions firm led by McKinsey, IIM, ISB and IIT alumni with deep industry experience and a flair for coaching. We are focused at helping our clients develop skills in basic and advanced analytics to enable them to emerge as "Industry Ready" professionals and enhance career opportunities. AnalytixLabs has been also featured as top institutes by prestigious publications like Analytics India Magazine and Higher Education Review, since 2013.



Candidates trained by us are working in leading companies across industries…

Program Objective – Full Stack Data Science

On average 8 hours of self-study per week



**Pre-learning content refers to basic foundation concepts and candidates are required to go through these using e-learning modules in self-paced mode*

1. Building Blocks

Introduction to Basic Statistics

- Introduction to Statistics
- Measures of central tendencies
- Measures of variance
- Measures of frequency
- Measures of Rank
- Basics of Probability, distributions
- Conditional Probability (Bayes Theorem)

Introduction to Mathematical foundations

- Introduction to Linear Algebra
  - Matrices Operations
- Introduction to Calculus
  - Derivatives & Integration
  - Maxima, minima
  - Area under the curve
- Theory of optimization

Introduction to Analytics & Data Science

- What is analytics & Data Science?
- Business Analytics vs. Data Analytics vs. Data Science
- Common Terms in Analytics
- Analytics vs. Data warehousing, OLAP, MIS Reporting
- Types of data (Structured vs. Unstructured vs. Semi Structured)
- Relevance of Analytics in industry and need of the hour
- Critical success drivers
- Overview of analytics tools & their popularity
- Analytics Methodology & problem solving framework
- Stages of Analytics

2. Python For Data Science (1/2)

Python Essentials (Core)

- Overview of Python- Starting with Python
- Why Python for data science?
  - Anaconda vs. python
- Introduction to installation of Python
- Introduction to Python IDE's(Jupyter,/Ipython)
- Concept of Packages - Important packages
  - NumPy, SciPy, scikit-learn, Pandas, Matplotlib, etc
- Installing & loading Packages & Name Spaces
- Data Types & Data objects/structures (strings, Tuples, Lists, Dictionaries)
- List and Dictionary Comprehensions
- Variable & Value Labels – Date & Time Values
- Basic Operations – Mathematical/string/date
- Control flow & conditional statements
- Debugging & Code profiling
- Python Built-in Functions (Text, numeric, date, utility functions)
- User defined functions – Lambda functions
- Concept of apply functions
- Python – Objects – OOPs concepts
- How to create & call class and modules?

Operations with NumPy (Numerical Python)

- What is NumPy?
- Overview of functions & methods in NumPy
- Data structures in NumPy
- Creating arrays and initializing
- Reading arrays from files
- Special initializing functions
- Slicing and indexing
- Reshaping arrays
- Combining arrays
- NumPy Maths

Overview of Pandas

- What is pandas, its functions & methods
- Pandas Data Structures (Series & Data Frames)
- Creating Data Structures (Data import – reading into pandas)

Cleansing Data with Python

- Understand the data
- Sub Setting / Filtering / Slicing Data
  - Using [] brackets
  - Using indexing or referring with column names/rows
  - Using functions
  - Dropping rows & columns
- Mutation of table (Adding/deleting columns)
- Binning data (Binning numerical variables in to categorical variables)
- Renaming columns or rows
- Sorting (by data/values, index)
  - By one column or multiple columns
  - Ascending or Descending
- Type conversions
- Setting index
- Handling duplicates /missing/Outliers
- Creating dummies from categorical data (using get_dummies())
- Applying functions to all the variables in a data frame (broadcasting)
- Data manipulation tools(Operators, Functions, Packages, control structures, Loops, arrays etc.)

Data Analysis using Python

- Exploratory data analysis
- Descriptive statistics, Frequency Tables and summarization
- Uni-variate Analysis (Distribution of data & Graphical Analysis)
- Bi-Variate Analysis(Cross Tabs, Distributions & Relationships, Graphical Analysis)

2. Python For Data Science (2/2)

Data Visualization with Python

- Introduction to Data Visualization
- Introduction to Matplotlib
- Basic Plotting with Matplotlib
- Line Plots

Basic Visualization Tools

- Area Plots
- Histograms
- Bar Charts
- Pie Charts
- Box Plots
- Scatter Plots
- Bubble Plots

Advanced Visualization Tools

- Waffle Charts
- Word Clouds
- Seaborn and Regression Plots

Visualizing Geospatial Data

- Introduction to Folium
- Maps with Markers
- Choropleth Maps

Statistical Methods & Hypothesis Testing

- Descriptive vs. Inferential Statistics
- What is probability distribution?
- Important distributions (discrete & continuous distributions)
- Deep dive of normal distributions and properties
- Concept of sampling & types of sampling
- Concept of standard error and central limit theorem
- Concept of Hypothesis Testing
- Statistical Methods - Z/t-tests (One sample, independent, paired), ANOVA, Correlation and Chi-square

3. Predicting Modeling & Machine Learning

Introduction to Predictive Modeling

- Concept of model in analytics and how it is used?
- Common terminology used in modeling process
- Types of Business problems - Mapping of Algorithms
- Different Phases of Predictive Modeling
- Data Exploration for modeling
- Exploring the data and identifying any problems with the data (Data Audit Report)
- Identify missing/Outliers in the data
- Visualize the data trends and patterns

Introduction to Machine Learning

- Applications of Machine Learning
- Supervised vs Unsupervised Learning
- Overall process of executing the ML project
- Stages of ML Project
- Concept of Over fitting and Under fitting (Bias-Variance Trade off) & Performance Metrics
- Concept of feature engineering
- Regularization (LASSO, Elastic net and Ridge)
- Types of Cross validation(Train & Test, K-Fold validation etc.)
- Concept of optimization - Gradient descent algorithm
- Cost & optimization functions
- Python libraries suitable for Machine Learning

Supervised Learning: Regression problems

- Linear Regression
- Non-linear Regression
- K-Nearest Neighbor
- Decision Trees
- Ensemble Learning - Bagging, Random Forest, Adaboost, Gradient Boost, XGBoost
- Support Vector Regressor

Supervised Learning: Classification problems

- Logistic Regression
- K-Nearest Neighbor
- Naïve Bayes Classifier
- Decision Trees
- Ensemble Learning - Bagging, Random Forest, Adaboost, Gradient Boost, XGBoost
- Support Vector Classifier

Unsupervised Learning

- Principle Component Analysis
- K-Means Clustering
- Hierarchical Clustering
- Density-Based Clustering

Recommender Systems

- Content-based recommender systems
- Collaborative Filtering

Time Series Forecasting

- What is forecasting?
- Applications of forecasting
- Time Series Components and Decomposition
- Types of Seasonality
- Important terminology: lag, lead, Stationary, stationary tests, auto correlation & white noise, ACF & PACF plots, auto regression, differencing
- Classification of Time Series Techniques (Uni-variate & Multivariate)
- Time Series Modeling & Forecasting Techniques
  - Averages (Moving average, Weighted Moving Average)
  - ETS models (Holt Winter Methods)
  - Seasonal Decomposition
  - ARIMA/ARIMAX/SARIMA/SARIMAX
  - Regression
  - Evaluation of Forecasting Models

4. Text Mining using NLP

Introduction to Text Mining

- Text Mining - characteristics, trends
- Text Processing using Base Python & Pandas, Regular Expressions
    - Text processing using string functions & methods
    - Understanding regular expressions
    - Identifying patterns in the text using regular expressions

Text Processing with modules like NLTK, sklearn

- Getting Started with NLTK
- Introduction to NLP & NLTK
- Introduction to NLTK Modules (corpus, tokenize, Stem, collocations, tag, classify, cluster, tbl, chunk, Parse, ccg, sem, inference, metrics, app, chat, toolbox etc)

Initial data processing and simple statistical tools

- Reading data from file folder/from text file, from the Internet & Web scrapping, Data Parsing
- Cleaning and normalization of data
- Sentence Tokenize and Word Tokenize, Removing insignificant words("stop words"), Removing special symbols, removing bullet points and digits, changing letters to lowercase, stemming /lemmatization /chunking
- Creating Term-Document matrix
- Tagging text with parts of speech
- Word Sense Disambiguation
- Finding associations
- Measurement of similarity between documents and terms
- Visualization of term significance in the form of word clouds

Advanced data processing and visualization

- Vectorization (Count, TF-IDF, Word Embedding's)
- Sentiment analysis (vocabulary approach, based on Bayesian probability methods)
- Name entity recognition (NER)
- Methods of data visualization
    - word length counts plot
    - word frequency plots
    - word clouds
    - correlation plots
    - letter frequency plot
    - Heat map
- Grouping texts using different methods
- Language Models and n-grams -- Statistical Models of Unseen Data (Smoothing)

Text Mining – Predictive Modeling

- Semantic similarity between texts
- Text Segmentation
- Topic Mining (LDA)
- Text Classification(spam detection, sentiment analysis, Intent Analysis)

5. AI & Cloud Computing

Introduction to Artificial Intelligence (AI)

- Modern era of AI
- Role of Machine learning & Deep Learning in AI
- Hardware for AI (CPU vs. GPU vs. FPGA)
- Software Frameworks for AI & Deep Learning
- Key Industry applications of AI

Introduction to Deep Learning

- What are the Limitations of Machine Learning?
- What is Deep Learning?
- Advantage of Deep Learning over Machine learning
- Reasons to go for Deep Learning
- Real-Life use cases of Deep Learning
- Overview of important python packages for Deep Learning

Introduction to Cloud Computing

- Introduction to Google Colab
- What is Cloud Computing? Why it matters?
- Traditional IT Infrastructure vs. Cloud Infrastructure
- Cloud Companies (IBM, Microsoft Azure, GCP, AWS) & their Cloud Services
- Use Cases of Cloud computing
- Over view of Cloud Segments: IaaS, PaaS, SaaS
- Overview of Cloud Deployment Models
- Implementation of ML/DL model in Cloud

Artificial Neural Network

- Overview of Neural Networks
- Hidden layers, hidden units
- Illustrate & Training a Perceptron
- Important Parameters of Perceptron
- Limitations of A Single Layer Perceptron
- Illustrate Multi-Layer Perceptron
- Activation function, Optimizers, Loss Functions
- Understand Backpropagation – Using Example

Deep Learning with Keras

- Define Keras
- How to compose Models in Keras
- Functional Composition
- Predefined Neural Network Layers
- What is Batch Normalization
- Saving and Loading a model with Keras
- Using Tensor Board with Keras
- Use-Case Implementation with Keras
- Intuitively building networks with Keras

Deep Learning with Tensorflow

- Hello World with TensorFlow
- Key concepts of Tensorflow
- Implementing various types of models
    - Linear/Non-linear models

Convolutional Neural Networks (CNN)

- CNN History
- Understanding CNNs
- CNN Application

Recurrent Neural Networks (RNN)

- Intro to RNN Model
- Long Short-Term memory (LSTM)
- Recursive Neural Tensor Network Theory
- Recurrent Neural Network Model

Unsupervised Learning

- Restricted Boltzmann Machine
- Collaborative Filtering with RBM

Auto Encoders

- Auto Encoders
- Deep Belief Network

Accelerating Deep Learning with GPU

- Hardware Accelerated Deep Learning
- Distributed Deep Learning
- Deep Learning in the Cloud

5. AI & Cloud Computing

Computer Vision Application

Introduction to Computer Vision OpenCV

- Introduction to OpenCV
- Core Functionalities
- Image processing using OpenCV
- Video processing using OpenCV
- Feature Detection
- Video Analysis

Computer Vision Applications

- •Concept of Transfer Learning
- •Popular Image net models
- •Object Classification
- •Object Detection
- •Object Tracking
- •Object Localization
- •Object Segmentation

Generative Adversarial Networks

Text Mining & Language Models with Deep Learning

Text Mining

- NLP vs. NLU vs. NLG
- Vectorization using Word Embedding's
- Word2vec and Glove

Language Models

- Transfer Learning in the Text Mining
- Introduction to Popular Language Models
  - ULMFiT
  - Transformer
  - Google's BERT
  - Transformer-XL
  - OpenAI's GPT-2
  - ELMo
  - Flair
  - StanfordNLP

Language Models Application

- Machine Translation
- Text Classification
- Text Segmentation
- Sentiment Analysis

Build Your Own Chatbot

- Introduction to Chatbots
- What are chatbots?
- Chatbots are trending
- How chatbots work
- Working with Intents
- Understanding Intents
- Working with Entities
- Understanding Entities
- Create Entities
- Import and Export Entities
- Defining the Dialog
- Putting it all together
- Building user-friendly chatbots
- Implement the Dialog
- Define Domain-Specific Intents
- Deploying to a WordPress site
- Add a preview and retrieve your credentials
- Deploy your Chatbot
- Watson Assistant in the Private Cloud

6. Industrial & Functional Sessions (Domain Understanding)

Introduction to Data Sources for Various Industries

Introduction to Analytics Project Management

Marketing Analytics

- Introduction to Marketing Function
- Marketing Research - Analytics
- Customer Analytics
- Campaign Analytics
- Pricing Analytics
- Marketing Return on Investment (MROI)
- Market Mix Models

Risk Analytics

- Introduction to Risk Function
- Enterprise Risk Function
- Credit Scoring (Application & Behavioral)
- Fraud Analytics

Operation Analytics

- Overview of Operation Analytics
- Applications Analytics in different functions
- Service Operations
- Manufacturing
- Logistics
- Business Support Functions (HR Analytics)
- Inventory Management

Digital Analytics(Web Analytics)

Social Network Analytics

Banking & Financial Services, Insurance

- Applications of analytics to various functions
- Retail Banking
- Commercial Banking
- Investment Banking
- Insurance

Retail & E-Commerce

- Customer Analytics
- Demand & Supply Chain
- Merchandizing & planning
- Price & Promotion Analysis
- Trust Analytics
- Customer Service
- A/B Testing
- Recommendation Engines

Pharma & Health Care

- Marketing & Sales Analytics
- Provider-Payer-Patient Analytics
- Claims Analytics
- Fraud Analytics
- MROI

Telecom & Network

- Network Analytics
- Subscriber Analytics
- Loyalty Analytics
- Revenue Leakage Analytics

Course completion and career assistance

Course completion & Certification criteria

- You shall be awarded an AnalytixLabs certificate only post the submission and evaluation of mandatory course project work. These will be provided as a part of the training.
- There is no pass/fail for these assignments and projects . Our objective is to ensure that trainees get strong hands-on experience so that they are well-prepared for job interviews along with performance at their jobs.
- Incase the assignments and projects are not up-to-the-mark, trainees are welcome to take help and support for improvisation.
- While weekly schedule is shared with trainees for regular assignments, candidates get 3 months, post course completion, to submit their final assignment and projects.

What is included in career assistance?

- Post successful course completion, candidates can seek assistance from AnalytixLabs for profile building. A team of seasoned professionals will help you based on your overall education background and work experience. This will be followed by interview preparation along with mock interviews (if required)
- Job referrals are based on the requirements we get from various organizations, HR consultants and large pool of AnalytixLabs' ex-students working in various companies.
- No one can truthfully provide job guarantee, particularly for good quality job profiles in Analytics. However, most of our students do get multiple interview calls and good career options based on the skills they learn during training. For this there will be continuous support from our side for as long as required.

Time and Investment

Training: 54 hours Pre-learning video based training + 126 hours live training + Practice,

INR ~~75,000~~ 60,000 + 18% GST - **with 20% Combo discount**

Timing: 6 hours per weekend live training (Saturday & Sunday 3 hours each) + Practice

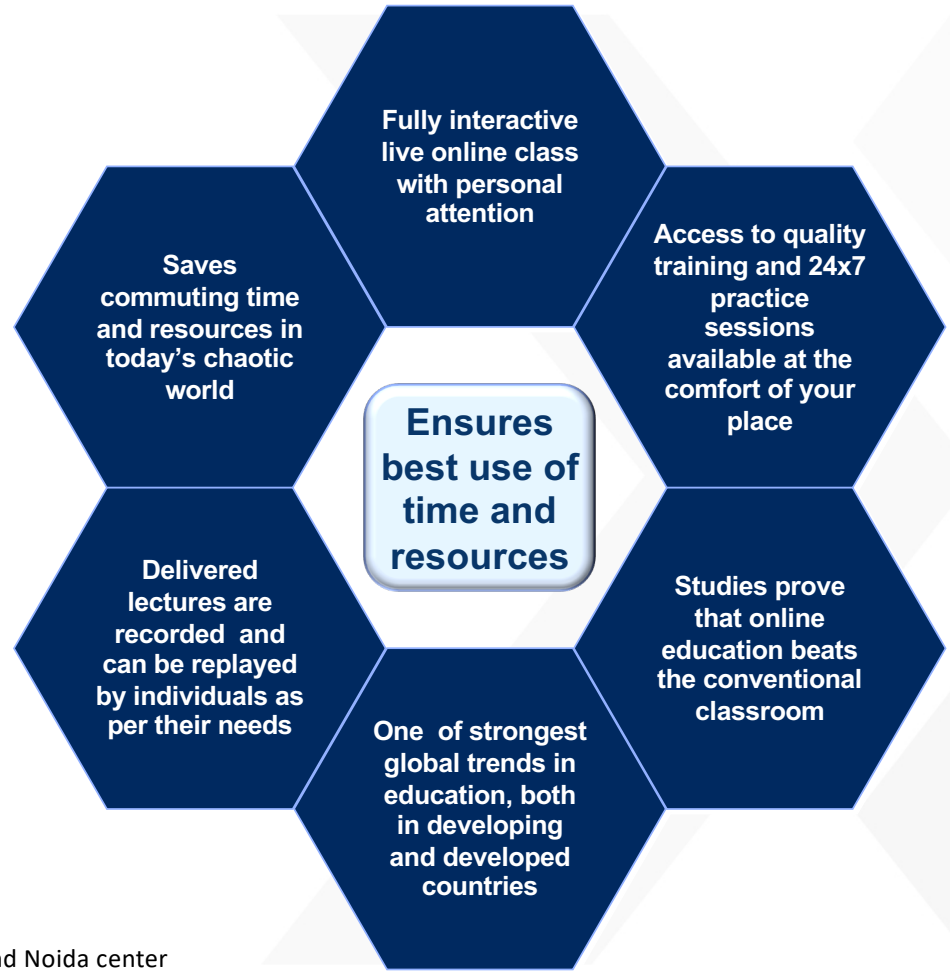
Training mode: Fully interactive live online class / Classroom (In Gurgaon, Bangalore and Noida center only)

(In addition to the above, you will also get access to the recordings for future reference and self study)

Components: Learning Management System access for courseware like class recordings - study material, Industry-relevant project work

Certification: Participants will be awarded a ***Co-branded Global certificate*** on successful completion of the stipulated requirements including an evaluation

We provide trainings both in ‘fully interactive live online’ and classroom* mode



*Classroom only available at Gurgaon, Bangalore and Noida center

Contact Us

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