Applied AI / Machine Learning Content

Fundamentals of Programming
- Python for Data Science Introduction
- Python for Data Science: Data Structures
- Python for Data Science: Functions
- Python for Data Science: NumPy
- Python for Data Science: Matplotlib
- Python for Data Science: Pandas
- Python for Data Science: Computational Complexity
- SQL

Module 2

Data Science: Exploratory Data Analysis and Data Visualization
- Plotting for exploratory data analysis (EDA)
- Linear Algebra
- Probability and Statistics
- Interview Questions on Probability and statistics
- Dimensionality reduction and Visualization:
- PCA(principal component analysis)
- (t-SNE)T-distributed Stochastic Neighborhood Embedding
- Interview Questions on Dimensionality Reduction
- Statistical Testing

Module 3

Foundations of NLP and Machine Learning
- Real world problem: Predict rating given product reviews on Amazon
- Classification And Regression Models: K-Nearest Neighbors
- Interview Questions on K-NN(K Nearest Neighbour)
- Classification algorithms in various situations
- Performance measurement of models
- Interview Questions on Performance Measurement Models
- Naive Bayes
- Logistic Regression
- Linear Regression
- Solving Optimization Problems
- Interview Questions on Logistic Regression and Linear Regression

Module 4

Machine Learning -II (Supervised Learning Models)
- Support Vector Machines (SVM)
- Interview Questions on Support Vector Machine
- Decision Trees
- Interview Questions on decision Trees
- Ensemble Models

Module 5

Feature Engineering, Productionization and deployment of ML Models
- Featurization and Feature engineering.
- Miscellaneous Topics

Module 6

Machine Learning - Real world Case studies
- Case Study 1: Quora question Pair Similarity Problem
- Case Study 2: Personalized Cancer Diagnosis
- Case Study 3: Facebook Friend Recommendation using Graph Mining
- Case study 4: Taxi demand prediction in New York City
- Case study 5: Stack overflow tag predictor
- Case Study 6: Microsoft Malware Detection

Module 7

Data Mining (Unsupervised Learning) and Recommender Systems + Real Word case studies
- Unsupervised learning/Clustering
- Hierarchical clustering Technique
- DBSCAN (Density based clustering) Technique
- Recommender Systems and Matrix Factorization
- Interview Questions on Recommender Systems and Matrix Factorization.
- Case Study 8: Amazon fashion discovery engine (Content Based recommendation)
- Case Study 9: Netflix Movie Recommendation System (Collaborative based recommendation)
- High Level + End-End Design of a Music Recommendation system

Module 8

Neural Networks, Computer Vision and Deep Learning
- Deep Learning: Neural Networks.
- Deep Learning: Deep Multi-layer perceptron's
- Deep Learning: TensorFlow and Keras.
- Deep Learning: Convolutional Neural Nets.
- Deep Learning: Long Short-term memory (LSTMs)
- Deep Learning: Generative Adversarial Networks (GANs)
- Encoder-Decoder Models
- Attention Models in Deep Learning
- Deep Learning: Transformers and BERT
- Deep Learning: Image Segmentation
- Deep Learning: Object Detection
- Deep Learning: GPT-1, 2 and GPT-3 Models
- OpenCV using Python
- Interview Questions on Deep Learning

Module 9

Deep Learning - Real world case studies
- Case Study 11: Human Activity Recognition
- Case Study 10: Self Driving Car
- Case Study 12: Music Generation using Deep-Learning
- Case Study 13: Semantic Search Engine for Q&A [Design + Code]
- Case Study 14: Building a Smart Gym Assistant from scratch

Module 10

MISC Topics: Spark for AI/ML, Big Data, Reinforcement Learning, ML Design
- Machine Learning High-Level Design
- Sample Interview and Conceptual Questions [AUDIO]
- Reinforcement Learning