Course Syllabus

Python Intermediate

- For loops
- While loops
- If
- Else
- Elif
- Break
- Continue
- Functions
- Lambda function
- Comprehensions

Python Advanced

- Error / Exception Handling
- File Handling
- JSON module
- OS Module
- Pickle Module
- Datetime Module
- Copy Module
- OOPs Concept
- Class
- Object
- Constructor
- Inheritance
- Polymorphism
- Abstraction
- Encapsulation

Statistics Advanced

- Descriptive Statistics
- Measure of central tendency
- Measure of dispersion
- Outliers
- Covariance
- Correlation

- Testing
- Hypothesis testing
- Mean
- Median
- Mode

Supervised Machine Learning Part 1

- Linear Regression
- Simple Linear Regression
- Multiple Linear Regression
- Polynomial Linear Regression
- Loss Function
- MSE
- MAE
- RMSE
- Optimizers
- Gradient Descent
- Regularization Parameters
- L1 and L2 Regularization
- Mini Project - 1: Developing Regression Model to find car cost status
- Mini Project - 2: Finding best Regression Line using Gradient Descent Optimizers

Supervised Machine Learning Part 2

- KNN
- Logistic Regression
- Naive Bayes
- Decision Tree
- Ensemble: Bagging Random Forest Classifier
- Ensemble: Boosting Gradient Boosting
- AdaBoost
- XG Boosting
- Support Vector Machine (SVM)

Deep Learning ANN

- Neurons
- Synapses
- Weights
- Biases
- Activation functions

- Input layer
- Hidden layers
- Output layer
- Feedforward networks
- Backpropagation
- Gradient descent
- Learning rate
- Loss function
- Epochs
- Batch size
- Training data
- Validation data
- Test data
- Overfitting
- Underfitting
- Regularization
- Dropout
- Weight initialization
- Normalization
- Standardization
- Hyperparameters
- Model evaluation
- Tanh
- ReLU
- Leaky ReLU
- Softmax
- Thresholded ReLU
- Mean Squared Error (MSE)
- Mean Absolute Error (MAE)
- Binary Cross-Entropy
- Categorical Cross-Entropy
- Sparse Categorical Cross-Entropy
- SGD
- Mini-batch Gradient Descent
- Adagrad
- Adadelta
- RMSprop
- Adam
- L1 regularization
- L2 regularization
- Dropout
- Data augmentation

- Batch normalization
- Layer normalization
- Accuracy
- Precision
- Recall
- F1-score
- ROC-AUC
- Confusion matrix
- Precision-Recall curve
- Mean Average Precision (mAP)
- R-squared

Deep Learning CNN

- Convolutional layers
- Filters (kernels)
- Feature maps
- Stride
- Padding
- Pooling layers
- Max pooling
- Average pooling
- Flattening
- Fully connected layers
- Softmax activation
- Cross-entropy loss
- Backpropagation
- Gradient descent
- Batch normalization
- Layer normalization
- Dropout
- VGG 16
- VGG19
- ResNet
- TensorFlow
- Keras

OpenCV

- Image reading and writing
- Image resizing
- Image rotation

- Image translation
- Image filtering
- Edge detection
- Contour detection
- Color space conversion
- Image thresholding
- Geometric transformations
- Feature detection
- Face detection
- Video processing

Computer Vision

- Viola Jones
- HOG
- Yolo v1
- Yolo v2
- Yolo v3
- Yolo v4
- Yolo v7
- Yolo v8
- Unet Segmentation
- v7 Segmentation
- POS Estimation

NLP - Natural Language Processing

- Tokenization
- Lowercasing
- Stop word removal
- Stemming
- Lemmatization
- Text normalization
- Removing punctuation
- Removing special characters
- Removing numbers
- Part-of-speech tagging
- Named entity recognition (NER)
- NLTK

Generative AI

- RNNs
- Hidden state
- Sequence modeling
- BPTT
- Vanishing gradient problem
- Exploding gradient problem
- LSTM
- GRU
- Bidirectional RNN
- Sequence-to-sequence models
- Encoders and Decoders
- Attention
- Transformers
- BERT
- Distilled BERT
- RoBERTa
- Hugging Face
- GPT Models
- Diffusion Models
- Stable Diffusion Models
- LangChain
- RAG

Power BI

- Power BI Introduction
- Power BI Installations
- Data Explanation
- Visualizations
- Bar chart
- Line chart
- Pie chart
- Area chart
- Scatter plot
- Bubble chart
- Treemap
- Funnel
- Card
- Geographic map
- Filled map
- Histogram

- Donut chart
- Model View Explanation
- DAX Formulas
- Power Query

SQL

- SELECT statement
- FROM clause
- WHERE clause
- JOINs
- INNER JOIN
- LEFT JOIN
- RIGHT JOIN
- FULL JOIN
- GROUP BY clause
- HAVING clause
- ORDER BY clause
- Aggregate functions
- Subqueries
- UNION and UNION ALL
- Views
- Indexes
- Transactions
- COMMIT
- ROLLBACK
- Constraints
- Data manipulation
- INSERT
- UPDATE
- DELETE

Excel

- Formulas and Functions
- Math formulas
- LOOKUP
- INDEX-MATCH
- PivotTables
- Charts and Graphs
- Column chart
- Line chart

- Pie chart
- Conditional Formatting
- Data Validation
- Named Ranges
- Excel Tables
- Text Manipulation Functions
- LEFT
- RIGHT
- CONCATENATE
- Date and Time Functions
- DATE
- TODAY
- MONTH
- Data Import and Export