

Weeks	Thoery (Note Book)	Practical (Record Book)	Mini Project	Online Course Work (Infosys Springboard)	Industrial Assignment Topics	Weekly Assessment Tasks(Tutorials)
Week 1	Fundamentals of AI: Definition, Working, Purpose, Types, Goals, Applications, Ethics, and AI SDLC	Git installation and Setup, Basic Local Git operations, Git Branching and Merging	Create repository - named mini project-1, push the same to GitHub	Git Essentials: Become a Git and Github Ninja	Real Industry experience of AI	Discussion on how AI will impact of daily life, work life, work force, jobs, products & services.
	Version Control System: Fundamentals of Git: , GitHub					Explore and Prepare a Report on all popular AI cloud services (ML & DL) offered by vendors.
						Examples of AI in real world
Week 2	Machine Learning: Fundamentals, ML types, ML workflow, ML applns, Challenges	Create an AWS account.	-	Machine Learning Fundamentals	Build Applications Using AI Cloud Services	Use of Machine Learning in Daily Life
	Data Science: Definition, Working and Uses	Environment Setup: Install required packages				Machine Learning Terminologies
	Cloud Computing: Essentials, Deployment Models, Service Models, Virtualization.	Python packages for MI & Deep Learning		Essentials of Cloud Computing		Explore AI(ML & DL) services across public cloud platforms.
	Bigdata: Defn, Sources, Role in AI & ML					Explore the Major Cloud Service Providers and Services offered by them.
Week 3	Explore NumPy module	Consider a dataset and infer the relations with the help of different plots.	-	Pandas and Numpy tips, tricks and techniques.	How to Create Project Plan and Product backlog for AI project	Basics of Python Visualization with Seaborn
	Explore Pandas ModulesS	Create a Git repository for following: Regression Project, Classification project, Clustering Project and Natural Language Processing.		Unpacking Numpy and Pandas		
	Data Visualization with Python: Basics of Python visualization with Matplotlib			Basics of Python Visualization		

Week 4	Data Engg Pipeline: Data Collection	Use relevant Python Packages to Compute Central tendency for the Parameters	Data Collection for stated problem.	Probability Distribution using Python	Statistics and Linear Algebra	Key Terminoligies in Statistics.
	Probability: Bayes Theorem, Central Limit theorem	Use relevant Python Packages to perform operations over Vectors and Matrices.	Data Exploration and Analysis for the stated problem.	Exploratory Data Analysis with Pandas and Python 3.x		
	Exploratory Data Analysis: Univariate data analysis: Testing-Hypothesis testing			Basics of Linear Algebra using Python.		
	Multivariate analysis: Covariance, Correlation					
	Linear algebra using Python					
Week 5	<b>Data Preprocessing: Data Cleaning:</b> Approaches to deal with missing values. Outliers: Detecting outliers, Dealing with Outliers	Dealing with Missing valus with different approaches.	-	Data Preprocessing	Feature Engineering	Demand of Data Science in Industries
	Data Integration: Overview, Challenges & Approaches.	Dealing with Outliers with different approaches.		Data Cleaning and Trasnformation		
	Data Reduction: Objectives, Methods	Data Integration				
	Data Transformation:	Data Reduction with Numerosity data reduction method.				

Week 6	Data Splitting: Importance, Underfitting & Overfitting	Split training & testing data sets in python using train_test_split() of sci-kit learn.			Optimization and Performance matrices for Regression	Applications of Regression
		Explore the options of train_test_split().				Applications of Linear Regression
	ML Pipeline: Model training_ Supervised learning: Regression-defn, types. Linear regression: Overview, Types	Student Score based on Study hours. Problem Statement: - Create a model to analyse the relation between CIE & SEE result. - Create a model to analyse the relation between crop yield and rain fall rate.				Identification and Collection of Regression dataset.
	Model Evaluation & Testing: Evaluate regression model, Evaluation metric, Multiple Linear Regression, Cross-Validation	Perform data exploration, Preprocessing and Splitting on datasets like - Boston housing price from sci-kit learn datasets - Cricket match result - past data - Performance of a cricket player- past data -Crop Yield - past data				
Week 7	Supervised Learning: Classification- types, models	Iris dataset from sci-kit learn: Perform data exploration, preprocessing and Splitting.			Hyper Parameter tuning for Classification	Explore other Regression algorithms such as Random Forest Regressor, Support Vector Regression, Lasso Regression.
	Decision trees, DecisionTreeClassifier	Build decision tress-based model in python for : Breast Cancer Wisconsin(diagnostic) dataset from sci-kit learn.				Applications of Classification Models
	Evaluation Metrics for Classification					

Week 8	Logistic Regression: Overview, Types, Working, Assumptions, Applications.	Build Logistic Regression model in Python	-	-	Comparison of Classification algorithms with real world scenario.	Explore & List the Ensemble Algorithms
	Support Vector Machine(SVM): Introduction, Working, Applications, Optimization.	Build a SVM model in python for Fish dataset from kaggle				
	Ensemble Learning: Introduction, Basic Techniques, Advanced techniques, Random forest.	Build Random Forest-based model in python for breast cancer wisconsin(Diagnostic) dataset from Kaggle				
Week 9	Unsupervised learning: Defn, Approaches, Challenges, Clustering types.	Evaluate the model using Inertia & Dunn Index metrics.	-	-	Compare various Clustering techniques.	Applications of Unsupervised Learning.
	K-means: Working.					Common methods to perform dimension reduction.
	Implementaion in Python: Evaluation metrics: Inertia, Dunn Index					
	Dimensionality Reduction: Imporatnce in ML					
	MLOps: Overview, Need, ML Pipeline, Versioning, Model Registry, Model Monitoring					

Week 10	Deep Learning: Defn, Models, Applns, Frameworks,	Envriment Setup: Local, Cloud	Regression: Rebuild with Deep Learning model	Deep Learning with TensorFlow	Building deep learning model with TensorFlow and Keras for Usecases.	Future impact of deep learning on variety of industries.
	Introduction to Neural Networks: Overview, Activation function, Cost function	Prepare data: Dealing with - Missing Values, - Categorical values.	Classification: Rebuild with Deep Learning model	TensorFlow for Beginners		Building Shallow Neural Network with Keras Dense Layer
	TensorFlow: Defn, Need, Ecosystem, Architecture, Program Elements.	Prepare data : Feature scaling with StandardScalar()	Analyse the Performance of ML & DL	Learning TensorFlow 2.0		Building Deep Neural Network with Keras Dense Layers
	Keras: Defn, Keras APIs, Layers.	Create a complete end to end neural network model using Keras Sequential Model and Keras Layer API				
	Keras Dense Layer	Local deployment with TensorFlow ModelServer				
Week 11	NLP: Overview, Approaches, Use cases, Tools & Libraries.	Commonly used NLP tools & libraries	-	-	NLP-text Summarization	Build a pipeline for text processing
	Text processing tasks (Processing Words)	Setup environment (spaCy or similar nlp package)				
	Tokenization					
	Stop word					
	Normalization					
	Parts of speech tagging					
	Named Entity Recognition					
Week 12	Sentiment Analysis (SA): What, Why, Applications, Working,	Conduct Sentiment analysis to classify movie reviews with - spaCy - TensorFlow and keras	-	Containers and Images	Using Cloud service for MLOps.	Discussion on the Ethics of AI
	Containers: Why	Install docker on desktop and start the docker tool.		Deploying and Running Docker Containers.		Deployment strategies
	Docker: What, Working, Components	Commands to create docker file.		Docker, Dockerfile and Docker Compose.		
		Build docker image with docker file				
		create docker container from docker image				
		Run the docker container				