

Course Name	Julia Programming for Data Science & Machine Learning
Course Duration	5 Day (40 hours)
Target Audience	Data Analyst, Data Scientist, ML Engineer
Course Outcomes	1. Understand the fundamentals of the Julia programming language.
	2. Gain a strong foundation in mathematical and statistical concepts for data science and machine learning.
	3. Develop proficiency in manipulating and analyzing data with DataFrames.jl and visualizing data with Plots.jl.
	4. Gain practical experience building, evaluating, and fine-tuning machine learning models with Flux.jl, and making decisions under uncertainty using POMDPs.jl.

Module 1: Introduction to Julia	
Module	Content
1.1	Overview of Julia
1.2	Setting up the development environment
1.3	Basic syntax
1.4	Control flow
1.5	Functions
Module 2: Maths & Statistics Foundations	
2.1	Linear Algebra
2.2	Calculus
2.3	Probability
2.4	Statistics
Module 3: Data Manipulation and Analysis	
3.1	Introduction to DataFrames.jl
3.2	Importing data
3.3	Data cleaning and transformation
3.4	Data visualization with Plots.jl
Module 4: Machine Learning Basics	
4.1	Introduction to Machine Learning
4.2	Types of Machine Learning
4.3	Feature engineering
4.4	Model selection and evaluation
4.5	Cross-validation
4.6	Regularization
Module 5: Supervised Learning	

5.1	Linear regression
5.2	Logistic regression
5.3	Decision trees
5.4	Random forests
5.5	Gradient Boosting
5.6	Support Vector Machines
Module 6: Unsupervised Learning	
6.1	Clustering
6.2	K-Means
6.3	Hierarchical clustering
6.4	Principal Component Analysis
6.5	Non-negative Matrix Factorization
Module 7: Deep Learning Concepts	
7.1	Introduction to Deep Learning
7.2	Neural Networks
7.3	Training deep models
7.4	Convolutional Neural Networks
7.5	Transfer learning
Module 8: Introduction to Flux.jl	
8.1	Building a neural network with Flux.jl
8.2	Activation functions
8.3	Loss functions
8.4	Backpropagation
Module 9: Decision Making under Uncertainty	
9.1	Introduction to POMDPs
9.2	Value Iteration
9.3	Monte Carlo methods
9.4	Policy optimization