

Sunbeam Modular Courses – Complete Syllabus & Details

COURSES

Course Information

Batch Schedule : 16-Aug-2025 To 17-Sep-2025

Schedule : Mon-Sat

Duration : 50 hrs.

Timings : 7:00 PM To 9:00 PM

Fees : Rs. 14900/- (Inc. 18% GST)

Target Audience:

Data Engineers, Python Developers, Freshers

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Syllabus:

Section 1: Spark Architecture & Internals

- Distributed Computing Fundamentals
- RDD lineage, DAG scheduler, lazy evaluation
- Cluster managers overview
- Spark 4.x Updates
- Adaptive Query Execution (AQE) enhancements
- Catalyst optimizer improvements
- Performance Tuning
- Joins
- Partitioning, broadcast variables
- Memory management

Section 2: PySpark DataFrames & SQL

- Data Manipulation
- Complex types (JSON, arrays, maps)
- Window functions, pivot tables, UDFs/Pandas UDFs
- Spark SQL Deep Dive
- Temp views, catalog API, Hive metastore integration
- SQL syntax for Delta Lake operations
- Execution Plans
- Reading `explain()` output

- Predicate pushdown, partition pruning
- Section 3: Incremental Data Processing & Apache Kafka
- Structured Streaming
 - Event-time processing, watermarking, state management
 - Kafka integration (source/sink)
 - Delta Lake Essentials
 - ACID transactions
 - Schema evolution
- Section 4: Spark Optimizations
- Catalyst Internals
 - Logical vs. physical plans
 - Custom optimization extensions
 - Performance Best Practices
 - File formats (Parquet/Delta)
 - Resource allocation (executors/cores)
- Section 5: Databricks Lakehouse Platform
- Lakehouse fundamentals
 - Workspace Navigation
 - DBFS, clusters, notebooks
 - Delta Lake UI
 - Viewing table history/schema
 - Data Governance
 - Unity Catalog basics (no Admin tasks)
- Section 6: Apache Kafka Fundamentals
- Architecture
 - Brokers, topics, partitions, consumer groups
 - Spark-Kafka Integration
 - Structured Streaming with Kafka
 - Job execution
- Section 7: Spark ML Introduction
- MLlib Workflow
 - Transformers vs. estimators, pipelines
 - Feature engineering (VectorAssembler, StringIndexer)
 - Model Training
 - Regression demo (no hyperparameter tuning)
- Section 8: Capstone Project
- Pipeline implementation
 - Domain Examples: IoT monitoring, retail analytics
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Prerequisites:

1. Python: Language Fundamentals, Functions, Collections, Pandas, ...
 2. SQL: CRUD Operations, Group By, Joins, Analytical queries,
 3. Good to have: Linux basics, Hadoop/Hive knowledge beneficial
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Tools & Setup:

- Local Installation: Spark 4.x, Java 11, Python 3.10
- Cloud: Databricks Community/Free Edition

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Outcome:

Master PySpark DataFrames/SQL for batch & stream processing

Build optimized pipelines using Catalyst insights

Understand Spark job execution internals

Understand Apache Kafka and Integrate with Spark

Hands-on implementation of capstone project

Certification-ready skills

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Important Notes:

1. Developer-Centric Focus:

- Covers PySpark application development (coding, debugging, optimization).
- Excludes: Cluster administration, infrastructure setup (YARN/K8s), or Spark cluster tuning.

2. Machine Learning Scope:

- Only introductory-level Spark ML (pipeline structure, basic concept).
- Excludes: Advanced ML concepts (hyperparameter tuning, etc), DL frameworks, or MLOps.

3. Language & Environment:

- PySpark (Python API) only Scala/Java/R APIs not covered.
- Databricks usage focuses on developer work, not account/admin management.

4. Kafka Integration:

- Covers Spark-as-Consumer/Producer not professional Kafka cluster setup, security, or Streams API.

5. Infrastructure Assumptions:

- All labs use local/standalone mode or Databricks Community Edition.

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Video Availability till date:

17th Nov 25

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Batch schedule

Sr.No Batch Code Start Date End Date Time

1 Spark-O-04 16-Aug-2025 17-Sep-2025 7:00 PM To 9:00 PM

Schedule : Mon-Sat

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COURSES

Course Information

Batch Schedule : 02-Feb-2026 To 23-Feb-2026

Schedule : Mon - Fri

Duration : 30 hrs.

Timings : 6:00 PM To 9:00 PM

Fees : Rs. 3400/-

Target Audience:

Students

Fresher's

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Course Contents:

English - (nouns,pronouns,verbs,adjectives,adverbs,prepositions,conjunction,articles,Tenses, Voice,Direct Indirect Speech, Idioms, Synonyms & Antonyms, Reading Comprehension)

Reasoning - (Analogy, Coding and Decoding, Syllogism, Blood Relations, Seating Arrangements, Puzzles, Directions, Data Sufficiency, Numerical Series, Ranking & Ordering)

Quantitative - (Number System, Percentage, Profit and Loss, Ratio & Proportion, Partnership, Average, Ages, Mixture & Alligation, Simple Interest & Compound Interest, cyclicity and remainder, Time Speed & Distance, Trains Boats & Streams, Time & Work, Wages (man Days), Pipes & Cisterns, Permutations & Combinations, Probability, Problems on Ages, Surds And Indices)

Test Series

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Recorded Videos:

Recorded videos will be accessible for up to 7 Days from the date of upload.

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Batch schedule

Sr.No Batch Code Start Date End Date Time

1 Aptitude-O-02 02-Feb-2026 23-Feb-2026 6:00 PM To 9:00 PM

Schedule : Mon - Fri

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COURSES

Course Information

Batch Schedule : 23-Jan-2026 To 20-Feb-2026

Schedule : Weekdays - (Mon-Fri)

Duration : 80 Hrs

Timings : 9:00 AM To 1:00 PM

Fees : Rs. 6800/- (Inc. 18% GST)

Target Audience:

Students

Fresher's

Working professionals

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Syllabus:

Java Language Fundamentals

Java language features

Overview of JDK, JRE and JVM

Data types and wrapper classes

Package, path and classpath

Arrays, Enum, jar file

OOPs Concept

Class, reference, instance

Constructor chaining

Object class

Static initializer block

Association and inheritance

Polymorphism and dynamic method dispatch

Abstract class and Interface

Exception Handling

Error and exception

Checked and unchecked Exception

Try-with-resource

Multi-catch block

Custom exception

Chained exceptions

Functional Programming Fundamentals

Nested and local class
Anonymous inner class
Functional interface
Lambda expression
Method and constructor references
Constructor Reference
Generics
Boxing/Auto-Boxing and Unboxing/Auto-Unboxing
Parameterized type
Bounded type parameter
Wild Card and its type
Generic method
String Handling
Overview of UNICODE
String, StringBuffer and StringBuilder
 StringTokenizer
Regular expression
Collection Framework
Comparable versus Comparator
List, ArrayList, Vector
Set, TreeSet
Hashing
 HashSet, Hashtable and HashMap
Java 8 Streams
Multithreading
Advantages & issues of process & thread
Thread class and Runnable
Thread States, life cycle
Race condition, deadlock, monitor
Synchronization and Object class
File IO
Path basics
Text file and binary file processing
Serialization and deserialization
SerialVersionUID
Reflection
Metadata and its application
java.lang.Class class
Overview of reflection classes and interfaces
Dynamic method invocation
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Pre-requisites:

OOP concepts: Class, Object, overloading, constructor, inheritance and virtual function.

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Software Setup:

SDK: Open JDK 1.8

Editor: MS VS Code

IDE: Eclipse

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Student Feedback:

Rohan Parmane: Your dedication and passion for teaching truly shine through in every lesson. Your ability to engage students and make complex concepts understandable is impressive. The positive environment you create in the classroom fosters both learning and growth. Keep up the excellent work Your thoughtful approach and dedication are greatly appreciated by me.

Ketan Kore: I've had the pleasure of learning Core Java under the tutelage of Sir, and I must say that he's the best mentor I've had. Their thorough understanding of Java fundamentals, combined with their ability to present complex topics in a straight forward and understandable manner, has been quite helpful in my learning process.

Ketan Kore: Your explanations are always clear and well-structured, which helps grasp difficult concepts more easily. Nice teaching, best interaction with us, great at doubt solving.

Rohan Parmane: excellent I will miss Sunbeam Teaching. Sir taught us very well. we got so much knowledge about java in just a little time. sir explained each concept very easily and understandably. Thank you sir for your valuable guidance.

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Batch schedule

Sr.No Batch Code Start Date End Date Time

1 CJ-O-17 23-Jan-2026 20-Feb-2026 9:00 AM To 1:00 PM

Schedule : Weekdays - (Mon-Fri)

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COURSES

Course Information

Batch Schedule : 29-Jan-2026 To 20-Feb-2026

Schedule : Weekdays - (Mon-Sat)

Duration : 60 HRS

Timings : 5:00 PM To 8:00 PM

Fees : Rs. 5900/- (Inc. 18% GST)

Target Audience:

Students

Fresher's

Working professionals

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Syllabus:

Algorithm Analysis:

Time complexity

Space complexity

Linked List:

Array advantages and disadvantages

Linked List concept

Linear Singly Linked List

Circular Singly Linked List

Linear and Circular Doubly Linked List

Complexity analysis of Linked List operations

Stack:

Stack concept

Stack using Array

Stack using Linked List

Expression conversion & evaluation (prefix, infix and postfix)

Parenthesis balancing

Complexity analysis of Stack operations

Queue:

Queue concept & types

Queue using Array

Queue using Linked List

Complexity analysis of Queue operations

Sorting:
Selection sort
Bubble sort
Insertion sort
Quick sort
Merge sort
Heap sort
Complexity analysis of sorting algorithms

Searching:
Linear Search
Binary Search
Hashing
Complexity analysis of searching algorithms

Tree:
Tree concept & types
Tree traversal (Inorder, Preorder and Postorder)
Binary Search Tree (BST) implementation
BST: add node, traversal, delete node, balancing, BFS & DFS.
Complexity analysis of BST algorithms

Graph:
Graph concept & types
Adjacency Matrix implementation
Adjacency List implementation
Spanning Tree algorithms: Prim's MST, Kruskal's MST
Shortest Path algorithms: Dijkstra, Bellman Ford, Warshall Floyd
Search algorithms: BFS, DFS, A* search
Complexity analysis of Graph algorithms
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Pre-requisites:

Java Programming: Class & Object, Generics, Java collections (ArrayList).
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Outcome:

Understand common data structures (array, linked list, stack & queue) and their applications.
Learn advanced data structures (hashing, trees, heap & graphs) and their operations.
Implement data structures and algorithms using Java.
Revise fundamentals for Data structure interviews.
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Software Setup:

Any IDE & compiler for Java

May use online editor

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Important Notes:

Code along with trainer in live class.

Assignments will be given for self practice.

Line by line implementation of data structures in Java.

Corresponding C++ & Python codes will be shared.

Discussion of frequently asked interview questions.

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Student Feedback:

Excellent Teaching, concept clearance and doubt clearing. Thank you sir for taking this wonderful session. Before this session I have only theory knowledge but now I am comfortable in code and logic also.

really enjoyed the approach of explaining DS. It was good. Cleared all the doubts which I have asked with no rush, maintained simplicity in teaching with each topics.

Abhilash Kamble

I don t owe my professional success to my destiny, courage, luck, belief, confidence or fortune. I owe it to a wonderful scholar like you. Nothing can come close to the inspirational presence of an instructor like you in a student s journey. You have no idea how important a role you play in shaping my research development, maybe we did not meet a lot, but those little encouragement words means a lot to me. I really enjoyed all of the readings and found they were diverse and inclusive. I learned a lot. Thank you for allowing us space to not only have dialogue but be creative within our assignments as well. I really learned some useful tips and tricks for DATA STRUCTURE AND ALGORITHMS which will help me in "Competitive Programming" as well. Thank you for being so encouraging and doing everything you can to keep us motivated and supported throughout our program. Your knowledge and leadership provide us with a priceless model for our own careers. Your diligence and direction have inspired my inner confidence to climb like a Tiger until I reach the pinnacle of my ambitions. One of the best decisions I had a fantastic time by taking your course in such Lock-Down period due to the COVID Pandemic. Thank you for loving your job so much! You are an amazing teacher!

Abhishek Verma

It was an amazing course as I imagined. Because of Nilesh sir's lecture, I got depth knowledge of data structure and I m sure this is more than enough to build my upcoming career. Sunbeam provides the best facilities of video lectures too and because of this facility, I personally got many profits if I forgot any concept I goes through these lectures and it will help me to understand these concepts. The enthusiasm which sunbeam provides always gives us good fruit. Thank you Sunbeam.

Ashish Mishra

The way of your explanation is excellent. I have learned first time Data structure and Algorithms but never felt tough in understanding at any moment. All the contents of data structures and algorithms learned very well and easily. Thank you very much, sir.

Aniket Katte

First of all, thank you for sharing your precious knowledge in a very efficient manner because even if I'm from none IT background I understood all things expertly. I'm sure that it will be very helpful throughout my career. Thank you

Tejas Jadhav

The best thing about the course is that this course is very punctual about timing and syllabus. None of the single point is not skipped. and in learning time there is a motivated environment. Nilesh sir's way of teaching is awesome now I am big fan of sir. As I am a last year student many of the concepts is not cleared but after this course, I have that confidence that I am really good in DSA. Thank you nilesh sir and Sunbeam Team.....!!!

Shubham Pate

all sessions are very well explained, understood very well, it will surely help me in dac course as data structure is a part of syllabus, the way of teaching was interesting, i enjoyed learning during course. Thanks a lot.

Bilal Pathan

Best approach to learn Ds is to learn through the basic and to learn basics is know basic .. the whole process by Nilesh sir made me understand Data structure in very simple way and to made an environment where we had an open discussion on of doubts without thinking whether to ask or not... Thanks a lot sir as beginner in data structure you have made me expert in ds what I need is now a paper work. So thanks a lot sir and thanks to vishal sir for helping me solve the basic problems.

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Getting Started with DS...

Course Highlight...

Time Complexity...

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Batch schedule

Sr.No Batch Code Start Date End Date Time

1 DSA-O-12 29-Jan-2026 20-Feb-2026 5:00 PM To 8:00 PM

Schedule : Weekdays - (Mon-Sat)

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COURSES

Course Information

Batch Schedule : 15-Sep-2025 To 20-Nov-2025

Schedule : Mon - Thu

Duration : 80 Hrs

Timings : 9:00 PM To 11:00 PM

Fees : Rs. 11100/-

Syllabus

Week 1: Linux

DevOps

Introduction to DevOps

SDLC and Agile fundamentals

DevOps Lifecycle

Introduction to the Tools used in DevOps Lifecycle

Linux

Installation and configuration using VM

Booting

File System

Working with Text files

Archiving and compressing files

User and Group management

File Permissions

Package management

Systemd management

Week 2: Git

Foundation of VCS

What is Git?

Git Workflow

Git Internals

Demystifying branching

Collaboration with GitHub

Week 3: Docker

Virtualization

Hardware virtualization vs Containerization

Docker fundamentals

Architecture

Installation and configuration

Image management
Container management
Docker network
Persisting data with Docker volumes
Container Orchestration with Docker Swarm

Week 4: Kubernetes

Introducing Kubernetes and its features
Architecture
Installation of configuration of Kubernetes cluster
Pod management
Secrets and ConfigMaps
Service and Networking
State persistence with PersistentVolumes and PersistentVolumeClaims
Observability
Probes

Week 5: Jenkins

Introduction to CI/CD pipeline
Jenkins cluster installation and configuration
Configuration of pipeline
Scripted pipeline
Implementing security with Jenkins
Setting up notifications
Using Jenkinsfile

Week 6: AWS

Introduction to Cloud
What is AWS?
AWS Services
Compute Services:
EC2 instance
VPC
Lambda
Storage Services: S3
Database Services: RDS (MySQL)
DevOps Services: CodeCommit, CodeBuild, CodeDeploy, X-Ray
Container Services: ECS, EKS

Week 7: Terraform

Infrastructure as a Code
Installation and Configuration
Terraform foundation
Workflow
Terraform modules
Implementing and maintaining states
HCP Terraform

Week 8: Ansible
Introduction to Ansible
Pull vs Push method
Installation and Configuration
Architecture and Design of Ansible
Diving into playbooks
Using Ansible with cloud
Using Ansible with containers
Modules and plugins
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Prerequisites

Basic Linux administration
Knowledge of any development stack
Knowledge of testing tools like Selenium and JUnit
Knowledge of build tools like Ant/Gradle/Maven
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Getting Started with DevOps

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Diwali Vacation Break:

Diwali Holidays are scheduled from 17th October 2025 to 31st October 2025.
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Batch schedule

Sr.No	Batch Code	Start Date	End Date	Time
1	Dev Ops-O-06	15-Sep-2025	20-Nov-2025	9:00 PM To 11:00 PM

Schedule : Mon - Thu
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COURSES

Course Information

Batch Schedule : 05-Jan-2026 To 09-Feb-2026

Schedule : Monday - Thursday

Duration : 5 weeks

Timings : 9:00 PM To 11:00 PM

Fees : Rs. INR 20000/- 12000/- (Inc.18% GST)

Prerequisite:

- Basic to intermediate Python programming (loops, functions, lists, dictionaries, basics of classes)
- Basic understanding of ML concepts (what a model, training, and loss mean)
- High-level math intuition: addition, subtraction, multiplication and division
- Familiarity with PyTorch or NumPy is helpful but not mandatory
- A laptop with 8 GB RAM (GPU recommended but not required)
- Curiosity and willingness to learn how LLMs work internally (not just use APIs)

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Syllabus:

Introduction to LLM

What is large language model?

Types of LLM

Applications of LLM

Requirements of DreamLLM

Mathematics and Pytorch required for LLM

Vectors

Matrices

Tensors

Linear Algebra

All maths topics with Pytorch implementation

Introduction to Deep Learning

Difference between ML and DL

Neural network architecture

Introduction to forward and backward propagation

Why should you build DreamLLM?

Strategies of building LLM

Fine tuning vs creating custom LLM

Supervised (labelled) vs unsupervised (unlabelled) training custom LLM

Architecture of DreamLLM
Transformers
Relationship between LLM and transformer
Introduction to transformers
Transformer architecture
Types of transformers
Understanding data
Data requirements to train DreamLLM
Preprocessing the data
Tokenization
Custom tokenization
Embeddings basics
Byte pair encoding
Processing data using sequence modelling
Introduction to RNN (LSTM and GRU)
Introduction and requirement of attention mechanism
Implementing attention mechanism
Self attention mechanism
Single head
Multi head
Creating LLM from scratch
Deciding the layers, activation functions
Implementing feed forward network
Generating text using custom LLM
Fine tuning for further tasks
Fine tuning the DreamLLM on labelled data
Fine tuning the DreamLLM on unlabelled data
Evaluation of DreamLLM
Deploying the DreamLLM
Use AWS cloud for deployment
Automate the deployment using AWS DevOps tools
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Outcomes:

Academic Outcomes
Theoretical Understanding
Deep knowledge of mathematical foundations (Linear Algebra, Probability & Statistics, Optimization).
Understanding key concepts in Machine Learning and Deep Learning.
In-depth knowledge of Transformer architectures, Attention Mechanisms, and their variants (GPT, BERT, T5).
Practical Skills

Proficiency in Python and the use of deep learning frameworks like TensorFlow and PyTorch.

Ability to implement, train, and fine-tune advanced neural network models.

Skills in data preprocessing, feature extraction, and handling large datasets.

Evaluation and Deployment

Knowledge of evaluation metrics for NLP models (BLEU, ROUGE).

Techniques for deploying LLMs in production environments using APIs and containerization tools (Docker, Kubernetes).

Professional Outcomes

Job Readiness

Enhanced employability in roles related to AI research, machine learning engineering, and NLP development.

Ability to tackle complex problems in natural language processing and develop innovative solutions

Research Capabilities - Skills to contribute to the field of AI and NLP through original research. -

Understanding of current trends, challenges, and opportunities in LLM development. -

Understanding of ethical considerations in AI and NLP, including bias mitigation, privacy, and data governance. - Commitment to developing AI solutions that are fair, transparent, and responsible.

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Capstone project:

Project Overview

Project Name: DreamLLM

Objective: Develop a state-of-the-art Large Language Model (LLM) from scratch, focusing on innovation and advanced capabilities.

Scope: The project aims to create an LLM with the ability to understand, generate, and interpret human language.

Target Audience: Researchers, developers, and enthusiasts interested in advanced AI and NLP.

Note: For the sake of time and infrastructure, the LLM will be trained on the limited data. (For the real version of it, you may want to go for huge data which will cost more.)

Technical Requirements

Programming Language: Python (version 3.11) Deep Learning Frameworks:PyTorch

Software Tools:

Jupyter Notebook

Git for version control

Docker for containerization (optional, depending on the participants)

Kubernetes for deployment (optional, depending on scalability needs)

Libraries and Tools:

Numpy, Pandas (for data manipulation)

NLTK or SpaCy (for text preprocessing)

Matplotlib, Seaborn (for data visualization)

Hardware Requirements:

Own infrastructure

High-performance GPU(s)

Sufficient storage for large datasets

Adequate RAM (minimum 32 GB)???????

Google Colab with TPU or GPU support

Runpod

Functional Requirements

Model Architecture:

Transformer-based architecture with advanced attention mechanisms

Support for different variants (e.g., GPT, BERT, T5)

Pre-training and fine-tuning capabilities

Data Handling:

Data preprocessing pipeline (tokenization, embedding)

Large dataset support (e.g., Wikipedia, Common Crawl)

Training Process:

Distributed training for scalability

Hyperparameter tuning (learning rate, batch size, etc.)

Evaluation Metrics:

Language accuracy metrics (BLEU, ROUGE)

Performance benchmarks (e.g., GLUE tasks)

Inference and Deployment:

API-based deployment (RESTful or gRPC)

Real-time inference capabilities

User Interface:

Web-based interface for interacting with the model (optional)

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Video recording will be available till 05 June 2026 on portal

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Batch schedule

Sr.No Batch Code Start Date End Date Time

1 DreamLLM-O-01 05-Jan-2026 09-Feb-2026 9:00 PM To 11:00 PM

Schedule : Monday - Thursday

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