

# **Emerging Technologies**

## **Big Data Architecture Program**

### **Curriculum**

#### **Program Outline :**

##### **Module 1: Fundamentals of Big Data**

1. **Introduction to Big Data Architecture** – Learn the core principles of Big Data systems and architecture.
2. **Big Data Technologies: Hadoop, Spark, Kafka** – Get hands-on with Big Data tools used in modern architectures.
3. **Data Collection and Ingestion** – Explore methods to ingest large-scale data efficiently.
4. **Distributed Systems and Data Storage** – Understand the structure and management of distributed data systems.

##### **Module 2: Advanced Data Architecture**

5. **Data Processing and Transformation** – Learn how to process and transform raw data into useful formats.
6. **Data Modeling for Big Data** – Develop techniques for structuring Big Data for effective storage and querying.
7. **Data Analytics in Big Data Architecture** – Learn how to analyze and derive insights from large datasets.
8. **Cloud-Based Big Data Solutions** – Implement scalable Big Data solutions on cloud platforms.
9. **Real-Time Data Streaming** – Master streaming technologies like Apache Kafka for real-time processing.

### **Module 3: Practical Applications**

- 10. **Big Data Security and Governance** – Implement security and compliance practices for Big Data.
- 11. **Performance Optimization for Big Data Systems** – Focus on tuning Big Data systems for maximum performance.
- 12. **Data Quality and Consistency** – Learn techniques to ensure data integrity and consistency.
- 13. **Machine Learning for Big Data** – Apply machine learning techniques to Big Data problems.
- 14. **Advanced Data Integration Techniques** – Integrate and optimize data from various sources.

### **Module 4: Capstone Project**

- 15. **Data Warehouse and Data Lake Architectures** – Learn how to design and manage data storage solutions for large datasets.
- 16. **Big Data Processing Frameworks (MapReduce, Flink, etc.)** – Gain hands-on experience with popular Big Data processing frameworks.
- 17. **Data Privacy and Compliance** – Study data privacy laws and how to implement compliant systems.
- 18. **Scalable Machine Learning Models** – Build scalable machine learning models that can process Big Data.
- 19. **Capstone Project for Big Data Architecture** – Apply your knowledge to a real-world data architecture project.

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### **Elective Modules**

- 20. **Data Privacy and Governance** – Learn best practices for managing data privacy and ensuring compliance.
- 21. **Machine Learning in Big Data** – Dive deeper into machine learning for Big Data applications.
- 22. **Cloud Computing for Big Data** – Learn how to optimize Big Data architectures on cloud platforms.

**Websites:**

- <https://chools.in/>
- <https://ramaqchools.com/>
- <https://www.choolsgroup.com/>