

Syllabus – CCAT-SEPT-2023

Computer Fundamentals and Concepts of Programming

- Evaluation and Types of Computers
- Number Systems, Conversions and Data Representation (Binary, hex, octal etc.)
- Input and Output Devices
- Low level language vs High level language
- Evaluation of Programming languages
- Algorithm and Flowcharts
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Basics of BigData

- Big Data Concept
- Characteristics of Big Data
 - Volume, Velocity, Variety, Veracity, Value
- History of Big Data
- Big Data Processing
 - Batch processing
 - Streaming processing
- Types of data
 - Structured
 - Semi-structured
 - Unstructured
- Databases
 - RDBMS - ACID, SQL (basic concept only)
 - NoSQL - BASE, CAP theorem
- ETL vs ELT
- Data warehouse - OLAP vs OLTP
 - Data cleansing
 - Data modeling
- Data Engineering Life Cycle - Overview
- Big Data Frameworks (short intro only)
 - Hadoop
 - Hive
 - Spark
- Big Data Programming Languages
 - Python, Java, Scala
- Big data jobs/career opportunities

Introduction Artificial Intelligence

- **Definition of AI** : Definition of AI , What is agent, What is environment and Need of AI
- **AI Understanding** : What are AI Elements?
- **Types of AI** : Purely Reactive ,Limited Memory, Theory of Mind, Self aware

- **Main Domains of AI technology** : Data Science, Computer Vision and Natural Language Processing(NLP)
- **History of AI**
- **Ways to implement AI** : Introduction to Machine Learning and its categories (supervised and unsupervised) algorithm, Introduction to Deep Learning (input layer, hidden layer and output layer)
- **AI Uses and its various Applications**
- **Advantages and Disadvantages of AI**
Introduction to Neural Networks : What is neural network? What is Fuzzy Logic? and what is the meaning of Genetic Algorithms?
- **Current Trends and Future Directions in AI**