# **Curriculum for Artificial Intelligence**.

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Under this curriculum the learners would be taught about the Artificial Intelligence & it's real-life applications. For this the curriculum of the course is divided into four parts with whole duration of 24 Hours. They are as:

1. Python Basics. (6 Hours)
2. Maths Basics. (2 Hours)
3. Artificial Intelligence. (12 Hours)
4. Useful Platforms for AI Development. (4 Hours)

The course curriculum can be defined as following topics:

1. **Python Basics**:
    a. About Python:
        i. What is Python?
        ii. Features of Python.
        iii. Uses of Python.
        iv. Environment Setup.
        v. IDE Setup: VS Code, Jupyter Lab, Google Colab & IBM Watson Studio.
    b. Python Basic concepts:
        i. Programming Basics in Python.
        ii. Python Data Types.
        iii. Control Flow Statements.
        iv. Functions.
        v. Objects & Classes.
    c. Python Advanced concepts:
        i. Python regular Expressions.
        ii. I/O Operations.
        iii. Exception.
        iv. Data Structures.
    d. Third Party Libraries.
        i. Introduction to 'pip'.
        ii. Useful 'pip' commands.
        iii. Numpy.
        iv. Pandas.
        v. Matplotlib.
        vi. Scipy.
        vii. Scikit-Learn.
        viii. Tensorflow – Tensorflow, tensorflow-gpu, keras, CUDA & cuDNN.
    e. CUDA & cuDNN setup with Nvidia GPU(s).

2. **Maths Basics**:
    a. Relation of Mathematics & AI.
    b. Linear Algebra:
        i. Basic Concepts & Operations.
        ii. Linear Transformation & Matrix

iii. Matrix Decomposition.

c. Probability & Statistics:
    i. Basics of Probability & Statistics.
    ii. Random variable & probability distribution.
    iii. Estimation.
d. Optimization Problem:
    i. Classification of Optimization problem.
    ii. Gradient descent method.

3. **Artificial Intelligence**:
    a. Artificial Intelligence:
        i. What is AI?
        ii. History of AI.
        iii. Future scope of AI.
        iv. How to achieve AI.
        v. Introduction to AI, ML & DL.
        vi. Difference among AI, ML & DL.
    b. Data Cleaning:
        i. What is Data & Datasets?
        ii. How to get Datasets?
        iii. Need of Data.
        iv. Data Examination.
        v. Data Cleansing.
        vi. Understanding features & labels
        vii. Process of feature selection.
    c. Machine Learning:
        i. What is ML?
        ii. Types of ML.
        iii. Different types of ML algorithms.
        iv. Process of ML.
        v. Case study & Hands on Practice.
    d. Deep Learning:
        i. What is DL?
        ii. DL Algorithms.
        iii. Activation Function, Normalizer & Optimizer.
        iv. What are neural Networks?
        v. Types of Neural Networks.
        vi. Case study & Hands on Practice.
    e. Model Building:
        i. Model Selection.
        ii. Model Building.
        iii. Model Exporting.
        iv. Model Deployment.
        v. Model Management

4. **Useful Platforms for AI Development:**
    a. Github:
        i. What is Github?
        ii. What is Git & Gitbash?
        iii. Github Codespaces.
        iv. Git commands.
    b. Kaggle:
        i. What is Kaggle?
        ii. Kaggle Competitions.
        iii. Finding Datasets on Kaggle.
    c. IBM Watson:
        i. What is Watson?
        ii. Watson Studio.
        iii. Watson APIs.
    d. NVIDIA:
        i. What is NVIDIA?
        ii. NVIDIA AI.
        iii. NVIDIA Omniverse.
        iv. NVIDIA GPU(s).
        v. NVIDIA CUDA & cuDNN.
    e. UiPath:
        i. What is RPA?
        ii. How to use RPA?
        iii. RPA & AI.
        iv. Integrating AI using RPA.

**Outcomes of Course:**

- Understanding how python can be used for AI Development.
- Understanding various ML Algorithms & their implementation.
- Understanding about Neural Networks & their implementation.
- Understanding the use of AI to solve Real-life Problems.
- Build & deploy own projects.