

COURSE PROSPECTUS

Name of the Course:	Online Certificate course in Machine Learning
Course Code:	232452015402
Starting Date:	4 th October 2023
Duration:	6 weeks (30 Hrs.)
Course Coordinator:	Karthick Rajan. N
Last date of Registration:	29 th September 2023

Preamble:

Machine learning is a subset of artificial intelligence (AI) that focuses on the use of data and algorithms to imitate the way that humans learn, gradually improving its accuracy. The machine learning field grew out of traditional statistics and artificial intelligence communities. From the efforts of mega-corporations such as Google, Microsoft, Facebook, Amazon, and so on, machine learning has become one of the hottest computational science topics in the last decade. Through their business processes, immense amounts of data have been and will be collected. This has provided an opportunity to re-invigorate the statistical and computational approaches to auto-generate useful models from data. It's but natural that everyone today wants to connect with AI technology somehow, may it be as an end-user or pursuing a career in Artificial Intelligence.

Machine Learning has emerged as a leading technology used in Booming areas like Self-Driving cars, Virtual Assistants, Stock forecasts, Images, and Speech recognition. Currently available academic curriculum is not enough to fulfill the requirement of Skills needed for AI in the Industry. This course will offer required skills and hands-on experience in AI/ML to candidates and professionals; this will increase the employability opportunity for candidates and bridge the gap in Skilled Human requirements for Industry.

Objective of the Course:

To develop the skills required for Machine Learning Technologies with the use of Python as the programming language to analyze, clean the data, create beautiful visualizations, and develop the models using powerful Machine Learning algorithms.

Outcome of the Course: After successful completion of this Course, students can able to:

1. Able to write simple Python programs for Real-time problems.
2. Develop problem-solving capability using python scripts.
3. Learn to Analyze, clean, and Process the Data
4. Gained Hands on experience in how to use Data Analytics tools like Numpy, Panda
5. Able to develop applications using Machine Learning Algorithms & Sklearn tool

Course Structure:

S. No	Module Name	Duration (in Hrs.)
1	Python Programming	10
2	Data Analytics	10
3	Machine Learning	10
	Total	30

Other Details:

Course Fees: Rs. 2,000/- (Including GST) (Non-Refundable)

However, the above Training fee shall be refunded on a few special cases as given below:

1. If the course is postponed and the new date is not convenient for the student.
2. If the course is canceled.

Payment schedule: The Fee is to be paid in one instalment as given below.

Instalment No.	Last Date for Payment	Amount (in Rs.)
1	29-09-2023	Rs.2,000/-

Prerequisite: Knowledge of basic Mathematics

Eligibility:

1. 5th Semester onward B.E/B. Tech and above or
2. Final year MCA/M.Sc./B.Com/B.Sc and above

Number of Seats: 50

How to apply:

Candidates can apply online using the Google Form link <https://forms.gle/E4YWxHXXcVppf8NB8>.

Payment towards the Course fee can be paid through any one of the following modes:

- **ACCOUNT DETAILS:** **Account Name:** NIELIT Kolkata Tax, **Account No:** 3194198019
Branch: Central Bank of India, Jadavpur, Kolkata. **IFSC Code:** CBIN0281247
- Pay through UPI Mobile Apps Eg: Google Pay, Paytm, BHIM, Phone Pe

Note: Institute will not be responsible for any mistakes done by either the bank concerned or by the depositor while remitting the amount into our account.

Last date of Registration: 29th September 2023

Selection of candidates: Selection is based on a first-come basis (subject to fulfilling the eligibility criteria)

Admission Procedure:

All interested candidates are required to fill out the Registration form (in Google Form) with the Course fees on or before 29th September 2023. You are required to send the scanned copy (soft copy) of the following documents and make it into a single pdf and send it to mail id: karthickrajan.nielit@gmail.com on or before 29th September 2023.

- Self-attested copy of Degree certificate /Consolidated Mark sheet
- Self-attested copy of Semester mark sheets and College ID (only applicable for candidates who are currently studying)
- Self-attested copy of Govt. issued photo ID card (Only Aadhar Card)
- Passport size photograph
- Screenshot of the Successful Payment of the Course fee done.

Discontinuing the course: No fees under any circumstances shall be refunded in case of a student discontinues the course. No certificate shall be issued if discontinued.

Course Timings: 1 hour (4 PM. to 5 PM.) online daily from Monday to Friday

Mode of Training: Online

Certification: After Successful completion of the course, the examination will be conducted, and accordingly Certificate will be issued.

Grading Scheme:

Following Grading Scheme (on the basis of total marks) will be followed:

Grade	S	A	B	C	D	Fail
Marks Range (in %)	85 to 100	75 to 84	65 to 74	55 to 64	50 to 54	Below 50

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Jadavpur University Campus, Kolkata-700032

E-mail: karthickrajan.nielit@gmail.com / Phone: (033) 2414 - 6054/ 6081

Contact Person: Karthick Rajan. N, Mobile: 9940569468

Annexure

Detailed Syllabus of the Course:

Module-1: Python Programming

1. Introduction to Python Language and Pycharm IDE:

- ✓ About Python Language
- ✓ Companies using Python
- ✓ Features of Python
- ✓ Getting Started with Pycharm IDE

2. Basic Syntax:

- ✓ First Python Program
- ✓ Identifiers
- ✓ Keywords/Reserved Words
- ✓ Lines and Indentation
- ✓ Multi-Line Statements
- ✓ Quotation & Comments

3. Data types:

- ✓ Numbers
- ✓ String
- ✓ Lists
- ✓ Dictionaries
- ✓ Tuple
- ✓ Set

4. Operators:

- ✓ Operator & its Types
- ✓ Arithmetic Operators
- ✓ Comparison (Relational) Operators
- ✓ Assignment Operators
- ✓ Logical Operators
- ✓ Bitwise Operators
- ✓ Membership Operators
- ✓ Identity Operators

5. Flow Control in Python:

- ✓ Decision Making statements & Types
 - IF Statement
 - IF... ELSE... Statements
 - If...Elif Statement
- ✓ Loop statements & Types
 - while loop statements

- for loop statements
- break statement
- continue statement

6. Functions & Modules:

- ✓ Function definition and call
- ✓ Function Scope
- ✓ Arguments
- ✓ Pass by Reference
- ✓ Anonymous Functions
- ✓ The import Statement
- ✓ The from...import Statement

7. File I/O:

- ✓ Printing to the Screen
- ✓ Reading Keyboard Input
- ✓ Opening and Closing Files
- ✓ Reading and Writing Files
- ✓ Renaming and Deleting Files

8. Exception Handling:

- ✓ Standard Exceptions
- ✓ Assertions in Python
- ✓ What is an Exception?
- ✓ Handling an Exception
- ✓ Argument of an Exception
- ✓ Raising an Exception

9. Classes:

- ✓ Overview of OOP Terminology
- ✓ Creating Classes
- ✓ Creating Instance Objects
- ✓ Class Inheritance
- ✓ Overriding Methods

Module-2: Data Analytics

• Introduction

- ✓ Need for Data Science
- ✓ What is Data Science?
- ✓ Data Life Cycle
- ✓ Languages used for Data Science
- ✓ Basics of Python
 - Why learn Python?
- ✓ Python Libraries for Data Analysis

- **Numpy**

- ✓ What is Numpy?
- ✓ How do I install NumPy?
- ✓ NumPy Array
- ✓ NumPy Array v/s Python List
- ✓ Create an Array
 - linspace()
 - arange()
 - random.rand()
 - ones() & Zeros()
 - logspace()
 - Reshaping an Array
- ✓ Array Dimension
- ✓ Numpy operations-Addition
- ✓ Accessing Components of an Array
- ✓ Subset of Array
- ✓ Modifying Subset
 - Transpose()
 - Append()
 - Insert()
 - Delete()
- ✓ Matrices
 - Create
 - Properties
 - Matrix Modifying
 - Accessing Elements of Matrix
 - Matrix Addition
 - Matrix Subtraction
 - Matrix Multiplication
 - Matrix Division
- ✓ Linear Algebra
 - Linear Algebra operations
 - Determinant of Matrix
 - Rank & Inverse of Matrix
 - System of Linear Equations

- **Matplotlib**

- ✓ Why do we need Data Visualization?
- ✓ What is Data Visualization?
- ✓ What Is Python Matplotlib?
- ✓ Types Of Plots
 - Bar Graph
 - Histogram
 - Scatter Plot
 - Area Plot
 - Pie Chart

- **Pandas**
 - ✓ Why do we need Pandas?
 - ✓ Data Structures used in Pandas
 - ✓ Series Data Structures
 - From ndarray/List
 - From Dictionary
 - From scalar value
 - Slicing a Series
 - Accessing a value in Series
 - Vectorized operations with Series
 - Name attribute
 - ✓ Data Frame
 - 2-dimension

Module 3: Machine Learning

1) Data Pre-processing

- ✓ Getting Started
- ✓ Importing the Libraries
- ✓ Importing the Dataset
- ✓ Taking care of Missing Data
- ✓ Encoding Categorical Data
- ✓ Splitting the dataset into the Training set and Test set
- ✓ Feature Scaling

2) Regression

- ✓ Simple Linear Regression

3) Classification

- ✓ Logistic Regression
- ✓ K-Nearest Neighbors (K-NN)
- ✓ Decision Tree
- ✓ Random Forest

4) Clustering

- ✓ K-Means Clustering

5) Dimensionality Reduction

- ✓ Principal Component Analysis

6) Boosting

- ✓ XGBoost