COURSE PROSPECTUS

Name of the Group:	VLSI/ES/AE
Name of the Course:	**Online** Certificate course in Data Science and Machine Learning
Course Code:	AI 110
Starting Date:	**1st October 2020**
Duration:	6 weeks
Course Coordinator:	Mr. Ripunjay Singh (Scientist-D), Mob: 9445220125 (9AM – 6PM)
Last date of Registration:	25th September 2020

Preamble:

Machine Learning (ML) refers to technology used to do a task by machine that requires some level of intelligence to accomplish — in other words, a tool trained to do what a human can do. Why ML is different from ordinary software? Three core components — high-speed computation, a huge amount of quality data and advanced algorithms differentiates ML from ordinary software. Core ML technologies provide better accuracy and stability to everyday processes using an algorithm that connects quality data with fast computation services. Machine learning technology is used to add wisdom for progressively increasing amount of data. The use of ML and Data Science analysis offers better insight into how to execute and operate. The success of any organization depends on how effectively it combines people, process and technology intelligently to deliver transformational value at an optimized cost. ML will help to automate many back-office functions efficiently for reliable transactions and service delivery.

ML has emerged as a leading technology used in the Booming areas like Artificial Intelligence (AI), Internet of Things (IoT) and Data analytics. Currently available academic curriculum is not much enough to fulfil the requirement of Skills needed for ML in Industry. This course will offer required skills and hands-on experience in ML to candidate and professionals; this will increase the employability opportunity for candidate and bridge the gap of Skilled Human requirement for Industry.

Objective of the Course:

To develop the skills required for Machine Learning Technologies with use of Python to analyse data, create beautiful visualizations, and problem solving using powerful machine learning algorithms.

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

- Develop Programming Skills Required for Machine Learning
- Learn to Analyse and Process the Data
- Learn to use Data Analytics tools: Numpy, Panda for various applications
- Learn to use Machine learning tool Scikit - Learn for various applications
- Develop expertise in implementation of ML algorithm using Python

Course Structure:

S.No.	Topics	Duration (in weeks) via online mode
1	Module 1: Python Programming • An Introduction to Python • Beginning Python Basics • Python Program Flow • Functions& Modules • Exceptions Handling • File Handling • Classes in Python	2 weeks
2	Module 2: Data Science and Analytics • An Introduction to Data Science and Analytics • Data Analysis Using NumPy • Data Analysis Using Pandas • Data Visualization – Pandas, Matplotlib, Seaborne, Plotly and Cufflinks	2 weeks
3	Module 3: Statistical Learning • Descriptive & Inferential Statistics, • Probability Concept: Marginal, Joint & Conditional Probability, Bayes Theorem • Probability Distributions, • Entropy &Information Gain, • Regression & Correlation, • Confusion Matrix, Bias & Variance	
4	Module 4: Machine Learning • Introduction to Machine Learning • Linear Regression • Logistic Regression • K-Means Clustering • Decision Tree • Random Forest • K-Nearest Neighbours • Support Vector Machine • Naive Bayes	2 weeks
5	Mini Project & Assignments	Within the stipulated learning period
	Total	6 weeks

Other Details:

Course Fees: Rs. 1000/- (Including GST) (Non-Refundable)

However the above Training fee shall be refunded on few special cases as given below:
1. If course postponed and new date is not convenient for the student.
2. If course cancelled

Payment schedule: The Fee has to be paid in one installment as given below.

Instalment No.	Last Date for Payment	Amount (in Rs.)
1.	25-09-2020	Rs. **1000/-**

Pre-requisite/ Eligibility: Knowledge in Programming concepts and basic Mathematics

How to apply:

Candidates can apply online in our website https://reg.nielitchennai.edu.in/. Payment towards Course fee can be paid through any one of the following modes:

- Online transaction: **Beneficiary Name: NIELIT CHENNAI, Account No: 31185720641, Branch: Kottur (Chennai), IFSC Code: SBIN0001669**.
- Pay through Unified Payment Interface (UPI) payment methods eg: Google Pay, Paytm, BHIM, Phone Pe
- DD drawn from a nationalized bank (preferably SBI) in favor of ―NIELIT Chennai‖ payable at Chennai.

Note: The 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: 25th September 2020

Selection of candidates: Selection is based on the first come first serve basis

Admission Procedure:

All interested candidates are required to fill the Registration form with the Course fees before 25th September 2020 with all the necessary following documents.

- One passport size photograph and one stamp size photograph for identity card.
- Self-attested copy of Govt. issued photo ID card
- Candidates may also submit the certificate of their highest qualification

Note: Working days are from Monday to Friday.

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

Course Timings: 5 pm to 6 pm (1 hour online) from Monday to Friday
Mode of Training: Online

Certification:

After Successful completion of the course, Certificate will be issued.

Location:

NIELIT Chennai is located at Gandhi Mandapam Road, Kotturpuram, Chennai (Landmark: Opp. To Anna Centenary Library)

Address: National Institute of Electronics and Information Technology Chennai Centre,
ISTE Complex, No. 25, Gandhi Mandapam Road, Chennai – 600025
E-mail: training.chennai@nielit.gov.in
Phone: 044-24421445
Contact Person: Ripunjay Singh, Mobile: 9445220125. (9 AM- 6PM)

Course enquiries: Students can enquire about the various courses either on telephone or by personal contact between 9.15 A.M. to 5.15 P.M. (Lunch time 1.00 pm to 1.30 pm) Monday to Friday

Annexure

Detailed Syllabus of the Course

Module 1: Python Programming

- An Introduction to Python
- Beginning Python Basics
- Python Program Flow
- Functions& Modules
- Exceptions Handling
- File Handling
- Classes in Python

Learning Outcome:

- Capable of Programming with Python
- Able to Prepare Data for Analysis using Python
- Acquire the pre-requisite Python Programming Language skills to move into specific branches Machine Learning, Data Science, Deep Learning, Artificial Intelligence etc.

Module 2: Data Science and Analytics

- An Introduction to Data Science and Analytics
- Data Analysis Using NumPy,
- Data Analysis Using Pandas
- Data Visualization – Pandas, Matplotlib, Seaborne, Plotly and Cufflinks

Learning Outcome:

- Principals of Data Science and Analytics
- Able to use NumPy for Numerical Data
- Able to use Pandas for Data Analysis
- Able to use Data Visualization tools for interactive dynamic visualizations

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Module 3: Statistical Learning:

- Descriptive & Inferential Statistics,

- Probability Concept: Marginal, Joint & Conditional Probability, Bayes Theorem

- Probability Distributions,

- Entropy &Information Gain,

- Regression & Correlation,

- Confusion Matrix, Bias & Variance

Learning Outcome:

– Understand the mathematical principles required for Deep Learning.

– Able to Apply the principles in developing the Learning Model

– Able to implement model in python.

Module 4: Machine Learning

- Introduction to Machine Learning

- Linear Regression

- Logistic Regression

- K-Means Clustering

- Decision Tree

- Random Forest

- K-Nearest Neighbors

- Support Vector Machine

- Naive Bayes

Learning Outcome:

– Understanding of Machine Learning Algorithm.

– Develop expertise in implementation ML algorithm using Python.

– Able to use Machine learning Sklearn–tool for various applications.

Case Studies / Project

- Covid-19 data Analysis
- Predictive Analysis for Housing Prices
- E-Commerce Business Strategy based on user behavior
- Numerical Digit Image Classification using Regression Algorithm
- Kaggle's Titanic Survival
- Implementation of Spam filtering messages for Mails
- Machine Learning for Medical Diagnosis (Diabetic and Cancer)
- ML for Banking Application