National Institute of Electronics and Information Technology, Chennai

COURSE PROSPECTUS

Name of the Group:	Embedded Systems
Name of the Course:	**Online Summer Internship on Internet of Things with Data Analytics**
Course Code:	**ED103**
Starting Date:	12th July 2021
Duration:	6 Weeks
Course Coordinator:	Gokilapriya V
Last date of Registration:	7th July 2021

Preamble:

The collection and analysis of data from sensor-equipped devices in order to achieve a business or organisational goal is the Internet of Things or IoT is a key component in the wave of digital transformation underpinning the Fourth Industrial Revolution. The Internet of Things (IoT) paradigm is both revolutionary as well as an enabler of automated and convenient lifestyles for modern day humans. Exponential growth in the number of IoT devices will require new data-processing architectures and serious attention to security. But perhaps the key link in the value chain will be the application of artificial intelligence (AI) and machine learning (ML) algorithms to extract actionable insights from the resulting flood of IoT data. These algorithms could be deployed at the edge (flagging up and transmitting anomalous data patterns, for example), or at the core (analysing medium/long-term trends, for example).

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:

The main objective of this course is to develop skills required to handle large volume of data extracted from IoT by employing different analytical models to create beautiful visualizations, and problem solving using powerful machine learning algorithms.

Outcome of the course:

- Equipped in working environment for Networking Model
- Gained Hands on Experience to Configure TCP/IP and 6LoWPAN
- Exposure with IoT Development Boards
- Develop IoT board based different communication models
- 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 Syllabus:

IoT:

- Introduction to IoT, WoT and M2M
- Basics of Internet & Review of TCP/IP
- IoT Layering concepts
- Introduction to Wireless Sensor Networks
- Routing Protocols in WSN
- Wireless PAN, Different PAN standards - Bluetooth &Zigbee, GSM, Wifi
- IoT Development Boards,
- Data logging

Data Analytics:

Python Programming

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

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

Statistical Learning:

- Descriptive & Inferential Statistics,
- Probability Concept: Marginal, Joint & Conditional Probability, Bayes Theorem
- Probability Distributions,
- Entropy &Information Gain,
- Regression & Correlation,
- Confusion Matrix, Bias & Variance

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

Other Details:

Course Fees: Rs. 2500/- (Including GST) (Non-Refundable)

However the above registration 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 is to paid in one instalment as given below.

Instalment No.	Last Date for Payment	Amount (in Rs.)
1.	07-07-2021	Rs.2,500/-

Pre-requisite: Knowledge in Embedded ‘C’ & Microcontroller Architectures

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Eligibility: Students and Graduates of B.E./B. Tech/AMIE in Electronics/Electronics & Communication/Electrical/ Electrical and Electronics/Instrumentation/Electronics & Instrumentation/Instrumentation & Control/Computer Science/Information Technology/M.Sc.(Electronics)

Number of Seats: 50

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: 7th July 2021

Selection of candidates: First Come First Serve basis

Admission Procedure:

All interested candidates are required to fill the Registration form with the Course fees before **7th July 2021** with all the necessary following documents.

- Self-attested copy of Govt. issued photo ID card.
- Candidates must submit the proof of 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 Duration: 6 Weeks / 60Hrs. (Monday-Friday)

Course Timings: 10.30 AM to 12.30 PM

Mode of Training: Online

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Certification:
Certificate will be issued to all candidates who complete the course successfully

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: trng.chennai@nielit.gov.in / Phone: 044-24421445
Contact Person: Gokilapriya V, Mobile: 9962900976 (9AM to 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.