National Institute of Electronics and Information Technology, Chennai

COURSE PROSPECTUS

Name of the Group:	VLSI, ES & AE
Name of the Course:	**Online Summer Internship on IoT using Arduino and ESP8266**
Course Code:	ST106
Starting Date:	**28th June 2021**
Duration:	20 hours (4 Weeks – 1hr/day)
Course Coordinator:	Ishant Bajpai. +**91-9958016673**
Last date of Registration:	**25th June 2021**

Preamble:

- We live in the age, where information is just one click away and talking just one touch away. The near future of the this age is the Internet of Things (IoT), where physical things connected over a network will take part in Internet activities to exchange information about themselves and their surroundings. In other words, the IoT is nothing but a computing concept in which everyday objects with embedded hardware/devices are connected to a network or are simply online.
- An embedded system is a combination of hardware and software if both should be synchronized with each other. Some examples are as follows: industrial machines, automobiles, medical equipment, cameras, household appliances, airplanes, vending machines etc.
- Arduino is an open-source microcontroller platform that has been widely popular in the past decade among hobbyists and academics. Arduino is increasingly being adopted in courses span different disciplines in schools and universities. In this internship program you will learn how the Arduino microcontroller can be used for various embedded applications.
- IoT devices can often be small parts of a much larger collective system which includes large servers based in the cloud. This summer internship program will introduce the basics of networking and the Internet protocol and provide hands on exposure to various IOT projects using ESP 8266(Node MCU).

Objective:

- This summer internship program aim to develop expertise in embedded programming using Arduino microcontroller and build IoT projects using ESP 8266.

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

1. Learn embedded programming from the beginner to expert level
2. Learn to use LCD, LED and motors with microcontroller
3. Control & Monitor the electronic devices remotely
4. Learn to prepare standalone embedded projects for robotics and other applications

Course

SI. No.	Modules	Duration
Module 1	Prototyping Basics	Week1
Module 2	Programming Basics	Week2
Module 3	Arduino Programming	Week3
Module 4	Networking & IOT	Week4

Other Details:

Course Fees: (Non-Refundable) **Rs.700/- (Including GST)**

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 be paid in one instalment as given below.

Instalment No.	Last Date for Payment	Amount (in Rs.)
1.	25-06-2021	700/-

Eligibility: Pursuing students of BE/B.Tech/B.Sc programs or equivalent or higher

How to apply:

Candidates can apply online in our website http://reg.nielitchennai.edu.in/. Payment towards non-refundable Registration and 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 favour 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 June 2021

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

Admission Procedure:

All interested candidates are required to fill the Registration form with the Course fees before **25th June 2021** in the registration portal (http://reg.nielitchennai.edu.in/) and upload the following documents in the portal:

- One passport size photograph
- 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: 2PM to 3PM (1 hour online daily from Monday to Friday)

Mode of Training: Online

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

Location: NIELIT Chennai is located at Gandhi Mandapam Road, Kotturpuram, and Chennai (Landmark: Opp. To Anna Centenary Library). **But course will be offered in online blended Mode.**

Address: National Institute of Electronics and Information Technology Chennai Centre,
ISTE Complex, No. 25, Gandhi Mandapam Road, Chennai – 600025
E-mail: Ishant@nielit.gov.in
Contact Person: **Ishant Kumar Bajpai, Mobile: 9958016673**

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

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Detailed Syllabus of the Course

Module 1: Prototyping Basics

- Fundamentals of Electronics
- Essential Tools: Breadboard and jumper wires etc.
- Introduction to Microcontroller and Architecture of ATMEGA328P
- Introduction to Arduino IDE programing using Uno Board

Module 2: Programming Basics

- Basics of 'C' Programming:
  - Data Type
  - Control Statements (if-else)
  - Looping (while, for, switch)
  - Functions
  - Timers and Interrupts
  - SPI & I2C Communication Protocol

Module 3: Arduino Programming

- **Hardware Interfacing:** LCD, Keypad, Switches, Seven Segment Display, Relays (AC Appliance Control), Buzzer
- **Sensor Interfacing:** LDR, temperature, humidity, Distance, sound etc.
- **Actuators:** Servo Motors etc.

Module 4: Networking & IOT

- Introduction to Networking, structure of the Internet, Networking Protocols
- Interfacing with Cloud DB, Visualization of sensor data at cloud, control of devices using Android APIs, Google Assistant and other voice controlled applications.
- Case Studies and Mini-Project

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