

COURSE PROSPECTUS

Name of the Group: *Embedded Systems Group*

Name of the Course: **Internet of Things (IoT) Developer**

Course Code: **QG-4.5-IT-00346-2023-V1-NIELIT**

NSQF Level: **NSQF-aligned course of Level 4.5**

Starting Date: **23rd Oct 2024**

Duration: *540 hours/ 3.5 Months*

Course Coordinator: *Akula Sri Rama Pavan / Manoj*

Preamble: The “Internet of Things (IoT) Developer” course is designed to equip students with practical skills and comprehensive knowledge in basic electronics and IoT platforms. Through hands-on identification and troubleshooting of electronic components, students will learn to operate measurement devices and assemble circuits using breadboards and veroboards. The course also covers essential soldering and de-soldering techniques, as well as PCB troubleshooting. In the IoT curriculum, students will be introduced to microprocessors and microcontrollers, with a focus on the Arduino platform and embedded C programming to interface sensors and actuators. They will conceptualize and build IoT projects such as smart street lights, home automation systems, and password-enabled digital locks. The course further explores wireless IoT with NodeMCU, TCP/IP modeling, cloud platform fundamentals, and implementing cloud-based IoT use cases. Additionally, students will delve into using the Raspberry Pi as an IoT platform, learning Python programming, sensor and actuator interfacing, and developing IoT applications, thereby gaining the skills to create and monitor IoT systems using various technologies and platforms.

Objective of the Course: The objective of the “Internet of Things (IoT) Developer”, course is to equip students with practical skills and comprehensive knowledge in basic electronics and IoT platforms. Through hands-on identification and troubleshooting of electronics components. They will learn to operate measurement devices and assemble circuits using breadboards and veroboards. Additionally, the course covers soldering and de-soldering techniques, as well as PCB troubleshooting. The IoT curriculum introduces microprocessors and microcontrollers, focusing on the Arduino platform and embedded C programming to interface sensors and actuators. Students will conceptualize and build IoT projects like smart street lights, home automation systems, and password-enabled digital locks. Further, the course explores wireless IoT with NodeMCU, TCP/IP modeling, cloud platform fundamentals, and implementing cloud-based IoT use cases. Finally, students will delve into using the Raspberry Pi as an IoT platform, learning Python programming, sensor and actuator interfacing, and developing IoT applications, thereby gaining the skills to create and monitor IoT systems using various technologies and platforms.

Outcome of the Course: By the end of the "Internet of Things (IoT) Developer" course, students will possess advanced proficiency in identifying and troubleshooting electronic components, operating measurement devices, and assembling circuits using breadboards and veroboards. They will have mastered soldering, de-soldering, and PCB troubleshooting techniques essential for electronics development. In IoT, students will demonstrate expertise in microprocessor and microcontroller programming with Arduino using embedded C, effectively interfacing with sensors and actuators to develop sophisticated IoT projects like smart street lights, home automation systems, and digital locks. They will adeptly navigate wireless IoT technologies including NodeMCU and TCP/IP modeling, and grasp cloud platform fundamentals for deploying and managing cloud-based IoT applications. Moreover, students will leverage the Raspberry Pi for IoT applications, becoming proficient in Python programming, sensor and actuator integration, and overall system development, preparing them for careers in IoT development and innovation.

Expected Job Roles: Internet of Things (IoT) Developer

Course Structure:

Sl. No	Module Title	Duration (Hours)			Credit
		Theory	Lab	Total	
1	NOS 1: Identification and troubleshooting of Basic Electronics components	20	40	60	2
2	NOS 2: Conceptualising IoT Platform - Arduino	45	75	120	4
3	NOS 3: Conceptualising IoT based use-cases	20	40	60	2
4	NOS 4: Fundamentals of wireless IoT using NodeMCU	40	50	90	3
5	NOS 5: Conceptualising Single Board Computer as an IoT Platform - Raspberry Pi	25	35	60	2
	Sub total (A)	150	240	390	11
6	Employability Skills (B)	60			2
7	OJT/Project* (C)	90			3
	Total Duration/Credit	540			18

Other Contents

I. Course Fees:

General Candidates: Course fee is Rs. 19,052/- (Including NSQF Registration and Exam Fees with taxes as applicable)

SC/ST Candidates : Tuition Fees are waived for SC/ST students admitted under SCSP/TSP. However they are required to remit an amount of **Rs. 1652/-** towards NSQF registration and examination fee at the time of joining. This

amount will be considered as security deposit and will be refunded after successful completion of the course on first attempt. If the student fails to complete the course successfully, this amount along with any other caution/security deposits by the student will be forfeited.

It is mandatory that students attending NSQF aligned courses have to appear for NIELIT NSQF examination conducted by NIELIT Headquarter, New Delhi on fee payable basis. Successful candidates will be issued certificates by NIELIT HQ. If the student fails to clear the exam, **participation** certificates will be issued by NIELIT Calicut on passing the exam conducted by NIELIT Calicut.

Module wise Course Fee: Not Applicable for this course

II. Registration Fee: An amount of Rs.1000/- (including all taxes as applicable) (nonrefundable) should be paid at the time of registering for the course. This fee shall be considered as part of course fee, if the student joins the course. If the student does not join for the registered course / any of the registered courses, fee paid shall be forfeited.

SC/ST Candidates: Registration fee is Rs.500/- (nonrefundable)

However above the registration fee shall be refunded on few special cases as given below

- Course postponed and new date is not convenient for the student
- Course canceled in advance, well before the admission date

III. Course Fee Structure:

Fees	*Amount for General Candidates	Amount for SC/ST Candidates. (considered as caution/security deposit)	Due Date (on or before)
Registration Fee	Rs.1,000/-	Rs.500/-	During Registration
**Advance Fee/Caution deposit	Rs. 1,000/-	Nil	14/10/2024 (counselling day)
Course Fee	Rs. 17,052/-	Nil	
NSQF Registration & Exams Fee	Included in the Course fee	Rs. 1,652/- (Refundable on successful completion of course on first attempt)	
Total Fee	Rs. 19,052/-	Nil	

*The above fees is inclusive of CGST 9% and SGST 9%, and revision, if any by the Government shall be applicable at the time of payment.

Fine will be applicable for late fee payment.

** Advance fee - After publication of the first selection list, the students in the first selection list have to pay the Advance Deposit within the due date

to take the provisional admission. Students in the additional selection list should pay both the Advance and course fees together on or before counseling day. The registration fee will be added to the caution deposit/course fee if the candidate takes provisional admission.

IV. Eligibility: Any one of the following

- Completed 1st Year of UG
- Pursuing 1st year of UG and continuous education
- Pursuing 3rd year of 3-year diploma after 10th and continuous education
- Completed 3-year diploma after 10
- Completed 2nd year of 2-year diploma after 12th
- Pursuing 2nd year of 2-year diploma after 12 and continuous education
- Previous relevant Qualification of NSQF Level 4 and with minimum education as 8th Grade pass and 1.5 year relevant experience

V. Number of Seats: 20

VI. Selection of candidates: Based on marks in the qualifying exam.

VII. Test/Interview (*if applicable*): *Not Applicable*

VIII. Counseling/Admission: 14-10-2024

IX. Important Dates (if applicable):

Last date for applying: **06-10-2024**

Selection intimation through mail/website: **08-10-2024 (after 2 PM)**

Certificate Verification/Admission (online mode): **14-10-2024**

X. Course Timings:

Live sessions covering Theory will be scheduled between 9.30 am to 5.00 pm. Assignments and projects can be done at any time of your convenience and submitted before the deadlines provided. Support for completing lab work/assignments will be provided at scheduled times.

XI. Placement: Placement assistance will be provided.

XII. Lab Facilities

Skilled Manpower Advanced Research and Training (SMART) facility or Virtual Prototyping Lab is set up at NIELIT Calicut as part of Chip to Start-up (C2S) programme of MeitY for the proliferation of advanced VLSI and Embedded system design training, research, and electronics systems development across the country.

XIII. Course Contents: [Detailed Course Syllabus /Contents Link](#)

[Click here for General Terms and Conditions – Applicable to all courses](#)