

COURSE PROSPECTUS

Name of the Group: *Embedded System Group*

Name of the Course: *Certificate Course in Embedded System Design using ARM/
Cortex Microcontroller*

Course Code: *ED 664*

Starting Date: *26 February 2018*

Duration: *3 Weeks (80 Hours)*

Preamble: ARM is the most popular and widely used processor architecture in embedded industry today. So every embedded engineer/technician should be familiar with it. This course is suitable for the beginners in ARM and will provide an opportunity to learn programming & interfacing peripherals to ARM cortex based microcontroller and to learn troubleshooting of microcontroller based embedded electronic systems/products.

Objective of the Course: This course aims to make students to get the skills of programming the microcontroller, interfacing of external peripherals to microcontroller and troubleshooting of microcontroller based embedded electronic systems/products.

Outcome of the Course: On completion of the Course, the Participants shall get the expertise to work independently with responsibility in the embedded design industry where ARM Cortex Microcontroller based implementations are required.

Course Structure:

The course is planned for 80 hours duration with following topics

- Embedded C
- ARM /Cortex Architecture
- ARM/Cortex Peripherals
- Interfacing ARM/ Cortex to peripheral devices

Other Contents

a. **Course Fees :**

General Candidates: Course fee is Rs 15,000/- + GST

SC/ST Candidates: Tuition Fees/Examination fees are waived for SC/ST students admitted under SCSP/TSP. However they are required to remit an amount of Rs. **1,500/- as Advance caution/security deposit**. This amount will be considered as caution/security deposit and will be refunded after successful completion of the course. If the student fails to complete the course

successfully this amount along with any other caution/security deposits by the student will be forfeited.

Modular wise Course Fee: Not Applicable for this course

- b. **Registration Fee:** An amount of Rs.1000/- should be paid at the time of registering for the course. The same will be considered as caution deposit on student joining the course. This advance deposit will not be refunded for a selected candidate who does not join the course.
- c. **Course Fee Installment Structure:** Not applicable for this course
- d. Eligibility:
Diploma in Electronics/ Computer Science or higher
- e. Number of Seats : 20
- f. How to Apply :
Students are advised to apply online @ <http://nielit.gov.in/content/online-registration>. Payment towards advance fee of Rs.1,000/- may be paid the **SBI Collect Payment Gateway** @ <http://nielit.gov.in/calicut/content/mode-payments-0>

Rs.1000/- will be considered as refundable caution deposit on student joining the course, which will be refunded on successful completion of course. This advance deposit will not be refunded for a selected candidate who does not join the course.

SBI Collect Payment Gateway:

1. Please click the SBI Collect hyper link to enter the payment gateway.
2. Select Payment Category as *Course Fee*
3. Enter all the fields including amount payable and follow the instructions

The following details should reach here before the due dates.

1. Name of the Depositor
2. Name of the Student
3. Date of Payment
4. Amount Deposited
5. Purpose – Course Name:
6. UTR Number

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.

- g. Selection of candidates: based on the marks in the qualifying exam.
- h. Test/Interview (*if applicable*) : Not Applicable
- i. Counseling/Admission : 26-02-2018

- j. Spot Admission: If spot admission is open, spot admission will close within 2 days of Counseling/Admission of this course. On spot admission students should provide an undertaking saying that he/she is fully aware that he/she missed so much days of class and will not ask for extra classes or further extension of course.
- k. Admission Procedure :
- Students who have been selected for admission are required to report to the Institute on the prescribed day by 9:30 hrs along with the following
1. Original and attested Copies of Proof of Age, Qualifications, etc
 2. One passport size photograph and one stamp size photograph for identity card.
 3. SC/ST Certificate (Original and attested copies, if applicable)
 4. Income Certificate (Original and attested copy, if applicable)

The students on reaching the Institute are required to meet the Front Office Councilor (FOC). The FOC then directs the student to the Course Coordinator. The student gets the certificates and enrollment form verified by the Course Coordinator and then meets the FOC who shall direct the student to the Accounts for payment of fees. A student is thus admitted, attested copies of all documents shall be handed over to the Course Coordinator.

- l. Discontinuing the course: No fees (including the caution deposit) under any circumstances, shall be refunded in the event of a student discontinuing the course. No certificate shall be issued for the classes attended.

A student can however, be eligible for module certificates (applicable only for courses which provide for modular admission) which he has successfully completed provided, he/she has paid the entire course fees. This is not applicable to SC/ST candidates availing fee concession. SC/ST candidates availing fee concession are eligible for module certificates only after completing the full course with required attendance

- m. Course Timings: This program is a practical oriented one and hence there shall be more lab than theory classes. The classes and labs are from 9.30 am to 12.45 pm and 1.30 pm to 5.15 pm Monday to Friday.

- n. Location and how to reach :
- NIELIT Calicut is located very close to NIT campus and is about 22Kms from the Calicut (Kozhikode) city. A number of buses (Buses to NIT via Kunnamangalam) are available from "Palayam Bus Stand and KSRTC Bus Stand". The bus stop at our Institute is called "Panthrand" and is one stop before NIT. The bus fare is around Rs 17/- from Calicut City to NIELIT. Calicut (Kozhikode) is well connected by Rail, Road and Air from different parts of the country. The maximum and minimum temperatures range between 35°C and 20°C.

- o. 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.
- p. Important Dates (if applicable) :
Last date of application: 22-02-2018
Intimation of selection: 23-02-2018
Commencement of Classes: 26-02-2018
- q. Placement : Not Applicable
- r. Hostel facilities :
Hostel accommodation is available for boys and girls on monthly or daily chargeable basis. The hostel fee varies from Rs.1,400 /- to Rs.1,500/-- per month depending on the type of accommodation. However, students are required to pay the hostel fees for the duration of the course for which they are seeking admission at the time of joining the course.
- s. Canteen facilities :
Canteen & Mess facility is available for both boys & girls, students, those who avail mess facility should pay monthly mess fee @Rs.130/- per day. An amount of Rs.1,000/- should be paid as mess advance to the Canteen Contractor at the time of joining the mess which will be adjusted in the last month mess fee. An amount of Rs.3,000/- should be paid as caution deposit (hostel & mess) at the time of joining the hostel which will be refunded/adjusted at the end of the course.
- t. Lab Facilities

We have state-of-the-art lab facility in embedded systems which include,

- *32-bit ARM Microcontroller Development Systems – ARM Cortex-M3/M4 STM32, ATMEL ARM9 EK & CIRRUS LOGIC EDB9315*
- *Friendly ARM, Raspberry PI, Intel Galileo and Arduino Boards*
- *8-bit & 16-bit Microcontroller Dev. Systems - Intel 8051, 80C196, MPLAB for PIC 16 & 18 series, Cygnal etc*
- *VxWorks, RTLinux & ChibiOS/RT RTOS*
- *Xilinx ISE FPGA Design Tools, Model Sim Simulator*
- *'C' compiler for 8051 (KEIL 'C' Development IDE), PIC (CCS), 80C196 (Tasking), ARM Developer Suite (ADS v1.)*
- *MATLAB, Simulink, TI 'C6000 target for MATLAB, LabView, Wireless LAN*
- *GSM/GPRS/GPS/Zigbee/Bluetooth/WiFi Modems.*
- *Wireless Simulators expertise in Glomosim, NS2, NS3, etc.*
- *Digital Storage & Mixed Signal Oscilloscopes (500, 350, 300, 100 MHz)*
- *EMI Test Setup, Logic Analyzer, SMD Rework station*

u. Course Contents :

Sessions	Description
Embedded C	Introduction to Embedded systems Introduction to C and Embedded C Introduction to Keil uVision
ARM /Cortex Architecture	Introduction to ARM/Cortex family microcontrollers Developing programs with ARM/Cortex microcontrollers. Simulating programs on Keil IDE
ARM/Cortex Peripherals (Timers/Interrupts/Serial port)	Introduction to Timers and interface with ARM/Cortex microcontroller Introduction to Interrupts and interface with ARM/Cortex microcontroller Introduction to Serial Port and interface with ARM/Cortex microcontroller Introduction to external peripherals
Interfacing ARM/ Cortex to peripheral devices(LCD, Stepper motor, Keypad etc)	Interfacing ARM/Cortex microcontroller with LCD Interfacing ARM/Cortex microcontroller with key board Interfacing ARM/Cortex microcontroller with stepper motor