

# TWO WEEKS ONLINE FACULTY DEVELOPMENT PROGRAMME (FDP)

ON

## EMBEDDED SYSTEMS

(13<sup>th</sup> – 22<sup>nd</sup> June, 2022)

Organized by

**E&ICT Academy, National Institute of Technology, Warangal**

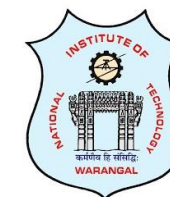
(Sponsored by Ministry of Electronics and Information Technology (MeitY), GoI)

in association with

**Department of Electronics and Communication Engineering**

**Indian Institute of Information Technology Design and Manufacturing, Kurnool - 518007, A.P., India**

(An Institute of National Importance under Ministry of Education, Govt. of India)



### Preamble

"Electronics & ICT Academy" was setup at NIT Warangal with financial assistance from MeitY, GoI. The jurisdiction of this academy is Telangana, Andhra Pradesh, Karnataka, Goa, Puducherry, and Andaman & Nicobar Islands. This academy's role is to offer faculty development programmes in standardized courses and emerging areas of Electronics, Information Communication Technologies, training & consultancy services for Industry, Curriculum development for Industry, CEP for working professionals, Advice and support for technical incubation and entrepreneurial activities.

### About this FDP

Embedded Systems play a key role in day-to-day activities of our life in the form of Societal, Personal, and Commercial applications. This course will provide the awareness of the embedded system and their usage for many applications. This course also provides the detailed information related to computer architecture and its various aspects. This course also explores awareness of Real Time Operating System and their functioning.

This program will discuss theoretical and practical aspects related to Hard/Soft Embedded Systems, Real Time Operating System, ARM7 Architecture/Instruction set, Cache Memory Organization, Hardware-Software Codesign, Computer Bus Standards, and IoT. Also, this programme gives demonstrations on freeRTOS related experiments using TIVAC Launch PAD with Keil IDE, ARM7 simulations using Keil IDE, and Hardware-Software Codesigns using Zed Board with Xilinx Vivado Design Suite.

### Major Course Contents (40 Hours)

- (1) **Introduction to Embedded Systems:** Hard, Soft, and Firm Embedded Systems. Characteristics of Embedded Systems.
- (2) **Introduction to Computer Architecture:** Details of Von-Neumann, Harvard, Super Harvard, VLIW, Super Scalar, SIMD, tightly coupled, and loosely coupled architectures.
- (3) **Instruction Set Architecture:** Instruction Pipeline, Data/Control Hazards, Data Hazard Resolution Techniques, Branch Predictors, Dynamic Instruction Scheduling Techniques.
- (4) **ARM 7: Architecture, Arm/Thumb Modes, Instruction Set, Addressing Mode, Simulation using Keil IDE.**
- (5) **Cache Memory Organization:** Cache Memory Mapping Techniques, Cache Memory Optimization Techniques, Cache Coherence Protocols.
- (6) **Real Time Operating System (RTOS):** Preemptive/non-preemptive Scheduling, Priority Scheduling, Mutex using Semaphore, Inter-task Communication using FIFO, Priority Inversion, freeRTOS Demonstrations using TIVAC Launch PAD.
- (7) **Hardware-Software Codesign:** Trade-offs, Demo using Zed Board with Xilinx Vivado.
- (8) **Computer Bus Standards:** I2C, SPI, UART, and so on.
- (9) **Introduction to IoT:** Components of IoT, Protocols, and so on.

### Faculty Coordinator this FDP

Dr. MA Basiri M,  
Assistant Professor and HoD,  
Department of Electronics and Communication Engineering,  
IIITDM Kurnool,  
Contact: asan@iiitk.ac.in, 91-8528024602

### Eligibility

The programme is open to faculty and PhD students of Engineering Colleges, Degree Colleges and other allied disciplines in India. Industry personnel working in the concerned /allied discipline can also attend.

### Registration Fee

Faculty and Research Scholars	Rs.750/-
Industry Participants	Rs.2250/-

### Online Transfer Details

Account Name: Electronics & ICT Academy  
NITW Account No: 62423775910  
IFSC: SBIN0020149  
Bank and Branch: State Bank of India, NIT(REC)  
Warangal

### How to apply

1. Pay the registration fee as mentioned in the above table.
2. Fill the online registration form using the link given below:

<https://forms.gle/Vsd5q2hkVheqgsu29>

3. Selection will be done based on first-come-first-serve basis to a maximum number of 150.
4. Candidates will be issued satisfactory certificates on successful completion of the course.

### About NIT Warangal:

National Institute of Technology, Warangal is the first among 17 RECs setup as joint venture of the Government of India and the state government. Over the years, the college has established itself as a premier Institute imparting technical education of a very high standard leading to the B.Tech degrees in various branches of engineering, M.Tech. and Ph.D programs in various specializations. All B. Tech and M.Tech programmes of NIT Warangal are NBA accredited. The Institute is well known for its dedicated faculty, staff and the state-of-the art infrastructure conducive to a healthy academic environment. The Institute is constantly striving to achieve higher levels of technical excellence. Evolving a socially relevant and yet internationally acceptable curriculum, implementing innovative, and effective teaching methodologies and focusing on the wholesome development of the students the concerns.

### About IIITDM Kurnool:

Indian Institute of Information Technology Design and Manufacturing, Kurnool (IIITDMK) was announced in 2014 after receiving the assent of President of India to the Institutes of Information Technology Act, 2014, and its subsequent publication in the Gazette of India, Extraordinary, Part- II, Section I, on December 08, 2014. The institute was announced by Government of India to give effect to its obligation under the Andhra Pradesh reorganization act 2014. The IIITDM Kurnool campus is located far away from the bustling life of the metropolis in the mineral-rich mountain trails of the Rayalaseema region of Andhra Pradesh. The campus is situated atop a hill that oversees Kurnool city.



### About the Department of Electronics and Communication Engineering (ECE):

The department of Electronics and Communication is considered as one of the best departments of IIITDM Kurnool as the department has expertise in teaching and research in the multidisciplinary areas related to VLSI Design, Embedded Systems, Wireless Communication, Electric Drives, Signal Processing, Sensors & Instrumentation, RF & Microwaves, and other related areas of ECE. The department of Electronics and Communication Engineering offers B.Tech in Electronics and Communication Engineering with specialization in Design and Manufacturing, M.Tech in Electronics System Design, and Ph.D programmes in the relevant areas of the department. The department has established state-of-art laboratories such as VLSI & Embedded Systems, Electric Drivers, Electronic Devices, Communications, and RF&Microwaves. These laboratories are equipped with advanced instruments and software to fulfill all needs of experimentation and research in the area of Electronics and Communication Engineering. The faculties of this department are pioneering in the Sponsoring Research, Consultancies, and Publications in the areas of the Electronics and Communication Engineering.

### Organizing Committee:

#### Chief Patron:

**Prof. DVLN Somayajulu**  
Director

Indian Institute of Information Technology  
Design and Manufacturing, Kurnool  
Jagannathagattu Hill, Dinnevarapadu Village,  
Kurnool - 518007, A.P.,India

#### Coordinator and Head of the Department:

**Dr. MA Basiri M**

Assistant Professor and HoD,  
Department of ECE,  
Indian Institute of Information Technology  
Design and Manufacturing, Kurnool  
Jagannathagattu Hill, Dinnevarapadu Village,  
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Contact No: 91-8528024602

For more information visit: [www.iiitk.ac.in](http://www.iiitk.ac.in)



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(13<sup>th</sup> - 22<sup>nd</sup> June, 2022)

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### Important Dates

Start date of online registration 15<sup>th</sup> March, 2022

Last date of online registration 10<sup>th</sup> June, 2022

Duration of the FDP 13<sup>th</sup> - 22<sup>nd</sup> June, 2022