

Advisory Committee

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Prof. Sanghamitra Manna (EIE Dept.,Techno India)
Prof. (Dr.) Subhra Sarkar (BSH Dept., Techno India)
Prof. B. Chakraborty (ME Dept., Techno India)

Organizing Committee

Ms. Poulami Dutta (In-Charge, Dept. of CSE)
Ms. Nairanjana Chowdhury(FDP Co-coordinator)
Ms. Mousumi Bhattacharyya (Technical committee)
Mr. Utpal Das (Technical committee)
Dr. Abdur Rahaman Sardar (Technical committee)
Mr. Mrinal Kanti Nath (Technical committee, Publicity and Branding)
Mr. Tapan Chowdhury (Registration)

Resource Persons

Prof. (Dr.) Amlan Chakrabati, Dean, Faculty of Engineering & Technology, AKCSIT, Calcutta University
Dr. Susanta Kumar Pal, Scientific Officer (H+), VECC Kolkata
Mr. Raveendranath, VP, Technical, Enixs System
Prof. (Dr.) Jitendra Nath Bera, Professor, Dept. of Applied Physics, Calcutta University
Prof. (Dr.) Rajarshi Gupta, Associate Professor, Dept. of Applied Physics, Calcutta University
Mr. Avik Bhattacharya, Technical Product Manager, Keysight Technologies
Dr. Rourab Paul, IIT Kanpur
Mr. Sangeet Saha, University of Calcutta
Mr. Utpal Das, Dept. of CSE, Techno India

Registration Fee (Includes Lunch, Kit & Workshop Resources)

Rs. 1000/- for participants from academics as well as industry and research organizations.
Demand draft in favor of
"Director, NIT Patna" payable at Patna, or
On-line Mode: **Account Name:** NIT Patna,
Account No: 50380476798,
IFSC: ALLA0212286.

Venue

Techno India,
EM 4/1 Sector V, Salt Lake,
Kolkata – 700 091

About NIT, Patna

National Institute of Technology Patna is the 18th National Institute of Technology created by the Ministry of H.R.D. Government of India after rechristening the erstwhile Bihar College of Engineering Patna on 28. 01. 2004. NIT Patna marked its humble beginning in 1886 with the establishment of pleaders survey training school which was subsequently promoted to Bihar College of Engineering Patna in 1924. This made this Institute the 6th oldest Engineering Institute of India. The Institute imparts high level education training, research and development in science, engineering technology and humanities along with high quality education and values at UG, PG and Ph.D level. At present the Institute has seven degree offering disciplines viz. Architecture, Civil Engineering, Computer Science & Engg., Electrical Engg., Electronics & Communication Engg., Information Technology and Mechanical Engg., and well established departments of physics, Chemistry, Mathematics and Humanities and Social Science.

About Dept. of CSE, Techno India

Department of Computer Science and Engineering was established in 2001 with an intake of 60 students, which eventually increased to 120 in 2011. The department's faculty members and technical assistants are rich in academic, industrial and research experience. With technology becoming insidious in everyday life, opportunities for computer engineers are plenty. The department laboratories are configured with latest technologies imparting utilities or practical knowledge. Apart from academics and projects the department also encourages its students to take part in extracurricular activities for an all round development and boosting confidence levels. Hence we encourage events like CSE United, Alumni meets and Farewell each academic year, polishing the quality each time.

About Electronics and ICT Academy

Ministry of Electronics and IT, GOI has instituted 7 Electronics and ICT academies, of which NIT Patna is one. This academy aims to design and organize basic as well as specialized training program in niche areas for development of knowledge base and skills.



ICT Academy, NIT Patna

Is organizing

FACULTY DEVELOPMENT PROGRAM

On

**"Embedded Systems-
Design and Development"**

in collaboration with



**Department of Computer Science and Engg.
Techno India, Salt Lake**

IN

Academic collaboration with



AKCSIT, University of Calcutta

Industry Collaboration with



Keysight Technologies

Duration: 18th to 24th May, 2017

Pre workshop online activity: 12th to 17th May, 2017

Post workshop online activity: 25th May to 27th May, 2017

Patrons

Prof.(Dr.) Asok De
Director, NIT, Patna

Mr. Goutam Roychowdhury
Chairman, TI Group

Mrs. Manashi Roychowdhury
Co Chairman, TI Group

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For any detail or query, please contact

Ms. Nairanjana Chowdhury

FDP Co-coordinator

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Overview

Embedded system products contain computing capabilities but are not as themselves computers, and may be found in a wide spectrum of applications. Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a large chassis or enclosure. The embedded systems market is snowballing at a furious pace and this trend has caught up with a majority of the populace from all across the globe. Engineering challenges are abound in the design and development of innovative products due to system level integration of hardware and software. Thus, it is emerging as one of the most promising career alternatives in today's epochs of state of the art technologies and advanced gadgets.

The Internet has experienced unprecedented growth especially since the 1990s and is continuing to evolve in terms of the information transfer speeds and infrastructure capacities in order to accommodate the growing number of users. The demand for bandwidth-both wired and wireless-and innovative new bandwidth-intensive services is soaring. Advances in research applications and paradigm shift to embedded systems (state of art hardware) and the evolution to cloud networking are also causing bandwidth pressure on existing networks.

This faculty development program aims to address faculties across disciplines to bring them to a common platform of understanding of the underlying technologies that address the challenges of this promising field of expertise and also give them exposure into current trends, tools, practices and services at high availability, reliability and flexibility in a cost effective manner, through session with experts from research fields as well as industry, where they shall brief about their current area of focus within this broad domain of study. The FDP will also cover unique challenges to management and security of the high-speed internets and how they are addressed. Other topics include emerging high-speed networking technologies and future trends.

Course Objective

The FDP aims

- To introduce fundamental concepts on embedded systems; focusing on their architecture and operations.
- To give a detail overview of system synthesis via different HDLs via simulation environment.
- To give thorough training on Embedded C via hands on experience.
- To give exposure to different embedded processors and microcontrollers.
- Develop an understanding, in terms of architecture, protocols and applications, of major high-speed networking technologies.

- To allow the participants to have an overview of the stated domain in other fields of application like healthcare, real time image and video processing, surveillance that warrant high speed and high capacity network technologies etc.
- To familiarize the participants with recent trends of networking in the industry.
- To discuss methodology and tools that will help explore and apply to real life scenario.
- To provide a platform to gain experience of doing independent study and research.

Course Outcome

By the end of the FDP, the participants shall

- Have a general overview of different embedded systems and System C
- Have hands on experience of system synthesis via HDL
- Have exposure to different real life cases, e.g. monitoring of human pulse rate.
- Have experience to design a remote control for domestic application.
- Have exposure to Arduino environment to create their embedded system at low cost.
- Understand the basics of high speed networking technologies and demonstrate the knowledge of network planning and optimization.
- Have overview of the field along various dimensions of real life applications, like, healthcare, video and image processing, GIS, design of high speed network and testing etc.
- Have a forum for exchanging ideas and information on current research studies, challenges, system developments and practical experiences in this emerging field of embedded system and its multidimensional applications.

Course Outline

- Introduction to High level Synthesis with a focus on latest embedded systems and System C
- 8051(AT89S52) microcontroller, Hardware Details, Delay calculation.
- Embedded C Programming in KEIL simulator.
- Overview of AVR Microcontroller (ATmega16)- architecture, development board and communication protocols.
- An embedded ATM Security Design using ARM Processor, LPC2148Microcontroller, AT77CI04B Finger Print Recognition and GSM.
- Overview of different sensor modules. Their working environment and ways of collecting and analyzing data.
- Exposure to industry-oriented work specifications in the field of embedded systems and its alignment with high speed network testing.

- Integrated Services Digital Network (ISDN) Architecture and Protocols.
- Applications of high speed network testing in high-speed optical networks, evaluation of intrusion detection systems etc.
- Embedded system and its wide spread applications in various real life scenarios like healthcare, GIS, image and video processing, cyber security, test care automation, local wireless area network testing etc.
- ATM Architecture and Protocol and ATM Traffic Management.
- How Simulation Testing helps guarantee safety and performance of New High-Speed Network Systems in the automobiles, high speed switch scheduling for LANs etc.
- Overview of the recent research trends of the field and their real life application scenarios.

Course Structure

This FDP shall run in a blended mode. The FDP working link will come alive on 12th May. All registered participants shall be able to go through the prerequisite materials uploaded in there. You will also have to take a few pre-course assignments, which will be online from time to time. Interactive sessions of the FDP shall begin from 18th May, 2017 and continue till 24th May, 2017. Another online session shall begin over moodle from 25th May, 2017 and continue till 27th May, 2017.

Important Dates

Registration opens: 1st May, 2017

Last date of registration: 10th May, 2017

Course date: 12th May to 27th May, 2017

Online activity: 12th May to 27th May, 2017

Post workshop online activity: 25th May to 27th May, 2017

Physical Interactive sessions: 18th May to 24th May, 2017

How To Apply

Please go to www.training.ticollege.org/cep, go to FDP link. Click on Registration, fill in your details. You can mail a scanned copy of the demand draft to tapan2005cse@gmail.com.

Spot registration is also possible depending on the availability of seats. In that case, an application form (which shall be provided to you on the spot) along with demand draft/cash may be submitted at the time of on-site registration on May 18th, 2017. No travelling allowance shall be paid by the Academy. For any correspondence regarding registration, please contact

Mr. Tapan Chowdhury,

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