AICTE QIP Short Term Course on Embedded System Design 25-31March 2019

Overview:

Information processing has become the heart of any modern electrical/electronic equipment. While in eighties and early nineties, the task of information processing used to be accomplished via large mainframe, mini, and personal computers, the trend has changed since significantly transferring the computation inside the new electronic gadgets being introduced in every front of life – consumer electronics, automobiles, home appliances, office automation etc. The continual effort to embed computational elements into larger application systems has given rise to the embedded systems. The design goals of these systems vary significantly from the general computational systems in the sense that they often have a set of very strict performance requirements, while at the same time, they have to meet many other design constraints. Future electronic engineers need to be equipped with the design methodology of such systems. Expertise in just one or few domains, such as, hardware, software, networking etc. may not be sufficient to enable the designer to take wise decisions regarding the implementation platforms and design techniques to be utilized for the cost-effective solutions to the design problems. An overall knowledge of all the fields with pros and cons of design alternatives is essential for designing such systems. As a subject, embedded system is an amalgamation of different fields such as computer architecture, operating systems, modeling real-world environment, interfacing standards, networking, algorithms, and so on. The purpose of this course is to encompass the essential principles of all these fields in the context of designing real-time embedded systems.

Course Schedule: March 25-31, 2019

Important Dates:

- **Last date for receiving applications: March 1, 2019**
- **Last date for intimation to applicants: March 8, 2019**

Goals and Objectives:

- Embedded Systems and their features
- Identifying various hardware platforms
- Enumerating different interfacing techniques
- Issues in real-time system design
- Hardware-Software Co-Design including Co-Simulation
- Hands-on with ARM microcontrollers

Venue:

Dept. of Electronics and Electrical Communication Engineering, Indian Institute of Technology Kharagpur

Course Content:

- **Introduction to Embedded Systems:** Definition – Features– Design Metrics –Design Flow – Example Embedded Systems
- **Embedded Processors:** ARM Microcontrollers – Digital Signal Processors – Field Programmable Gate Arrays – ASIC – Choice of Embedded Hardware Platform
- **Interfacing Standards:** Serial Peripheral Interface – Inter Integrated Circuits – RS-232C Series – Universal Serial Bus (USB) – Infrared Communication (IrDA) – Controller Area Network (CAN) – Bluetooth
- **Real-Time System Design:** Real-Time Tasks –Periodicity – Scheduling – Scheduling Algorithms RMS, EDF – Resource Sharing – Priority Inheritance Protocol – Example RTOS
- **Hardware-Software Co-design:** Co-Simulation– Partitioning Techniques: Integer Linear Programming, Kernighan-Lin Heuristic, Genetic Algorithms, Particle Swarm Optimization – Extended Partitioning – Power Aware Partitioning – Functional Partitioning and Optimization
- **Hands-on Training with ARM processor**

Eligibility:

This course is meant for teachers of engineering colleges recognized by the All India Council for Technical Education (AICTE). Applications need to be sent through proper channel. There is no course fee for AICTE affiliated colleges. Selected teachers will be paid TA at actuals subject to the limit of Three tier AC train/bus fare by the shortest route from the place of work to Kharagpur and back. However, the maximum TA payable is Rs.3000/-. They will be provided with boarding and lodging as per QIP rules (Max 7 days). The total number of seats are limited to 60 for applying and 30 candidates will be selected for the course.

In addition, non-sponsored AICTE approved college teachers and other self-supported teachers, scientists from research labs, practicing engineers from industries and others interested are eligible. They should pay the fees along with the application as under. Single room accommodation is available on the Institute campus at Technology Guest House. The participants have to request in advance along with the registration form for such accommodation. The lodging charges will be Rs.1500+18%GST per day, subject to availability of accommodation.

Students (Outside Kharagpur): 1000/-
Students (IIT Kharagpur):1000/-
Industry: 10000/-
Non faculty/Self-support candidates: 10000/-

Course Coordinator:

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How to Apply:

Apply at online by clicking "APPLY for CE Events" under EVENTS section in the Institute website **www.iitkgp.ac.in (https://erp.iitkgp.ac.in/CEP/courses.htm).** Non AICTE-QIP participants should pay their course fees online.