

TEQIP Short Course – Spring 2016 – May 2 to May 6

Designing Embedded Systems With AVR Microcontrollers

The seminar is concerned with technical and pedagogical aspects of teaching Embedded Systems in rapidly changing technological environment. AVR series of microcontrollers are excellent entry level platforms for simple applications and are now becoming the main topic for undergraduate students. They offer excellent migration path to bigger and more complex systems. Designing embedded systems nowadays include mastering two diverse technologies- harnessing architectural features and peripherals for fast response and using vast C++ library functions for high software productivity. This seminar helps faculty members to appreciate these both aspects - teach junior UG students to perform lab experiments and senior UG students to design and build projects using these microcontrollers.

A tentative topical outline is provided here, but it is open to change based on the needs of the participants.

1. Appreciating architecture of AVR Microcontroller, its peripherals and programming at register level in assembly and C language
2. C/C++ programming and use of IDEs for rapid prototyping
3. Interfacing various sensors, actuators & RF links using C library functions
4. Designing a small embedded systems project based on AVR microcontroller

Participants will have opportunities to discuss various issues - technical as well as pedagogical. Most topics will include presentation, discussion, and hands-on experience. The format of the seminar will be: lecture – discussion – followed by hands-on experience or demonstration. First half of the seminar will be devoted to learning about the microcontroller using various tools and experiments. The latter half will be devoted to planning and completing a small project by each team. The participants will design, present develop and showcase their work towards the culmination of workshop.

Lab Equipment: Labs will be based on Arduino boards and various accessories. Each participant will be given one microcontroller board and few accessories to familiarize with interfacing with AVR microcontroller so that they can continue with lab work after returning to their individual college.

Venue - Government Engineering College, Rajkot

Short Course Size: The Short Course is limited to 30 participants

Short Course Dates: Monday, May 2 to Friday, May 6, 2016

Presenters: Faculty:

- (i) **Prakash Dandekar**, Visiting Professor, D.A.V.V., Indore & IIT Gandhi Nagar
- (ii) **Dhananjay Gadre**, Asso. Prof., Netaji Subhas Institute Of Technology, Delhi
- (iii) **Chandresh Vithalani**, Prof. in E& C Engg. , GEC Rajkot