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Embedded System Design

Instructor

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Department: Dept of Electronic Systems Engineering

Course Time:

Lecture venue: ESE classroom

Detailed Course Page: http://shukra.dese.iisc.ernet.in/edwiki

Announcements

Brief description of the course

This course is mainly for the students from Electrical Sciences Division. The focus is on understanding issues

involved in building a working prototype of standalone embedded system. That includes,

 - understanding software and hardware design aspects,

- How to build and debug such system

The course follows hands-on approach and has substantial lab component. Also, mini-project is an important

part of the course were students are expected to build and demonstrate a working prototype a typical

embedded system

Prerequisites

- C programming language and basic data structures

Syllabus

Module 1: Toolchain

- Embedded Software Development Toolchain

  -- Compiler, Linker and Debugger

-- Understanding object files

Module 2: Hardware

- Processor Architecture: ARM Cortex M series

- Peripherals and memory subsystem

- Interfacing using I2C and SPI

Module 3: Software

- Designing and booting up Interrupt driven standalone system

- Introduction to RTOS and RTOS constructs

- Working with multi-tasking system

Module 4: Design and Debug

- Low power design

- Debugging techniques

Course outcomes

Students should be able to design and implement fairly complex embedded systems that may use interrupts

and have certain real time requirements to meet. Further, they should be able to troubleshoot and debug

already deployed systems

Grading policy

15% Mid-term 1

15% Mid-term 2

20% Lab assignments

15%   Mini project

35%   Final exam

Assignments

Resources