

Beagle bone black based Embedded System Design (Value Added course)

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Course Structure:

Course	Class	No. of students	Duration	Starting Date
Beagle bone black Programming	I M.Tech II Semester (DECS) & IV. B.Tech	70	3 hrs/week (Maximum of 30 hours)	01.10.2014

Prerequisite:

This course has no specific prerequisites. However some familiarities with the following are especially helpful.

- CISC,RISC processors
- C and Assembly Language Programming

Course Objectives:

The goal of this course is to familiarize students with the concepts and practical skills required to successfully program embedded systems. After finishing the course, students should feel comfortable building their own projects using small microcontrollers such as the BeagleBone Black from TI.

About BeagleBone Black:

BeagleBone Black is the latest addition to the BeagleBoard.org family and like its predecessors, is designed to address the Open Source Community, early adopters, and anyone interested in a low cost ARM Cortex-A8 based processor.

It has been equipped with a minimum set of features to allow the user to experience the power of the processor and is not intended as a full development platform as many of the features and interfaces supplied by the processor are not accessible from the BeagleBone Black via onboard support of some interfaces. It is not a complete product designed to do any particular function. It is a foundation for experimentation and learning how to program the processor and to access the peripherals by the creation of your own software

and hardware.

It also offers access to many of the interfaces and allows for the use of add-on boards called capes, to add many different combinations of features. A user may also develop their own board or add their own circuitry.

BeagleBone Black is manufactured and warranted by Circuitco LLC in Richardson Texas for the benefit of the community and its supporters. In addition, Circuitco provides the RMA support for the BeagleBone Black.

Topics to be covered:

- Basics of microcontrollers and its applications
- Introduction BeagleBone Black,Its architecture
 - What is BeagleBone Black
 - Unique qualities of BeagleBone Black
 - System attributes
 - Different development tools
- Introduction to bone script,cloud9 IDE and creating a project
 - What is bone script
 - What is cloud9 IDE
 - Workspaces and projects
- Building, debugging and watching variables, Break points
 - Understanding build options
 - Building and loading the project
 - Debug environment
- GPIO,Clock and Timers
- ADC,UART
- Flash writing, Character LCD