NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY
GREATER NOIDA
Department of Electronics & Communication Engineering
(NBA ACCREDITED)
Approved by AICTE and Affiliated to Dr. A.P.J. Abdul Kalam Technical University Uttar

Pradesh, Lucknow

Date of Activity: 23/11/2018

Title of the Activity:

To develop beyond the AKTU syllabus codes (programs) for Digital Signal Processing Lab (REC-553) in MATLAB and CCS.

Methodology:

Using MATLAB and CCS a group of students develop codes (programs) for their different assigned work in Digital Signal Processing Lab (REC-553).

Procedure of conducting the activity:

As per university syllabus there is a 12 practical's in Digital Signal Processing Lab (REC-553) as listed below:

Exp. No.	Name of Experiment
1	To study about DSP Processors and architecture of TMS320C6713 DSP processor.
2	Introduction to MATLAB and Code Composer Studio.
3	Write a MATLAB Program for the generation of basic signals such as unit impulse, unit step, ramp, exponential, sinusoidal and cosine.
4	To study matrix multiplication using code composer studio.
5	Evaluate 4 point DFT of and IDFT of $x(n) = 1$, $0 \leq n \leq 3$; 0 elsewhere.
6	To implement FFT algorithm.
7	Verify Blackman and Hamming windowing techniques.
8	Implement IIR Butterworth analog Low Pass for a 4 KHz cut off frequency.
9	Verify Circular Convolution using code composer studio.
10	Verify Linear convolution of two sequence using code composer studio.
11	To implement Tone Generation.
12	To implement floating point arithmetic.

Now for activity based learning we have make 2-3 students group and assigned practical's other than above list like write the program using MATLAB instead of CCS or vice-versa and change the windowing techniques other than already used.

Procedures:

Students group developed the codes (programs) in Digital Signal Processing Lab (REC-553) in room no. 220B on 23/11/2018. The procedures for using MATLAB and CCS are as follows:

For MATLAB:

1. Double click on Matlab icon.   -> Then Matlab will be opened
2. To write the Matlab Program   Go to file menu-> New -> Script(Mfile) -> In the opened Script file write the Matlab code and save the file with an extension of .m
   e.g.: "linear.m"
3. To execute Matlab Program Select the all lines in matlab program (ctrl+A) of mfile and press "F9" to execute the matlab code.
4. Entering the inputs in command window
   - If the command window is displaying the message like "enter the input sequence" then enter the sequence with square brackets and each sample values is spaced with single space Ex: Enter input sequence [1 2 3 4]
   - If it is asking a value input write the value without brackets
     Ex: "enter length of sequence 4"
   - After entering inputs it displays the Output Graphs.

For CCS:

1. To open Code Composer Studio (CCS), double click on its icon.
2. **To create the New Project:**
   a. Go to File menu ->New CCS Project (e.g. linear)
   b. New Empty Project (with main.c): Target: C671x Floating Point DSP, TMS320C6713. Compiler version TI v7.4.24. After project creation, select the project.
   c. Write program for the experiment in C-language e.g. write C-code of linear convolution.
   d. Go to Project menu ->Build Project. This will finish building the target output file as linear.out.
   e. Go to File ->New ->Target Configuration file. Write name of new target configuration file e.g. DSK6713.ccxml. Click Finish. Select Connection type as ->Spectrum Digital DSK-EVM-eZdsp on-board USB Emulator and tick the board or device ->DSK6713 and click on save to finalize the target configuration.
   f. Go to Run menu ->Debug. This will initialize the on-board emulator TMS320C6713 and load the program on the emulator for execution on the DSP chip.
   g. After successfully configuring the emulator click on the Play icon to check and verify the program.

The Result and Analysis:

Students learn the programs other than AKTU syllabus and as well as they are justify the result by both tool i.e. MATLAB and CCS.

Photographs related to this activity:
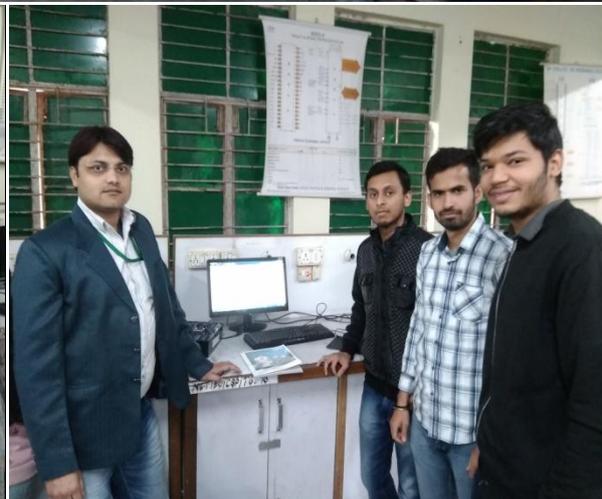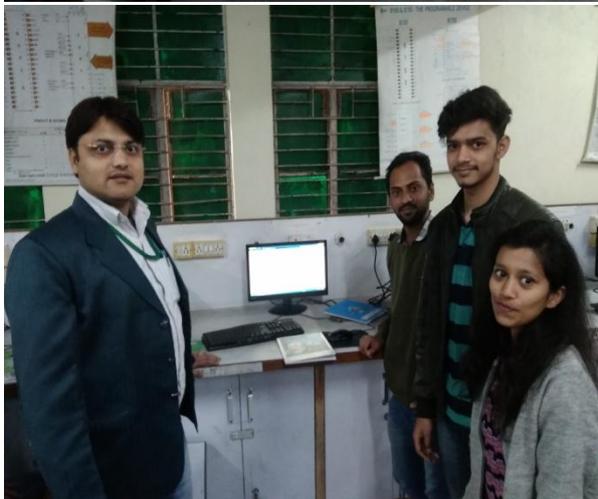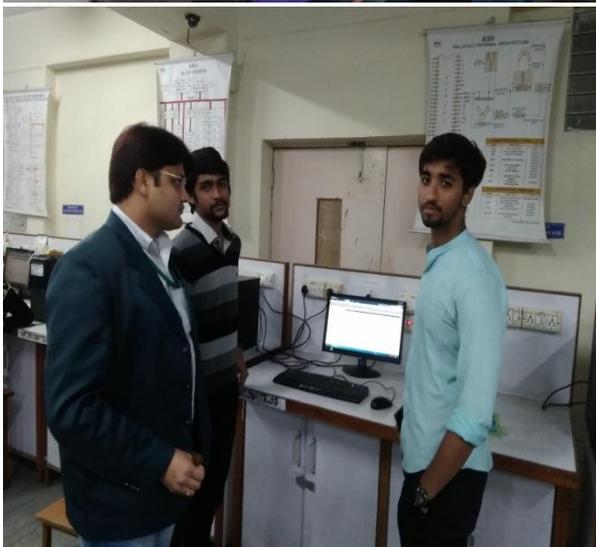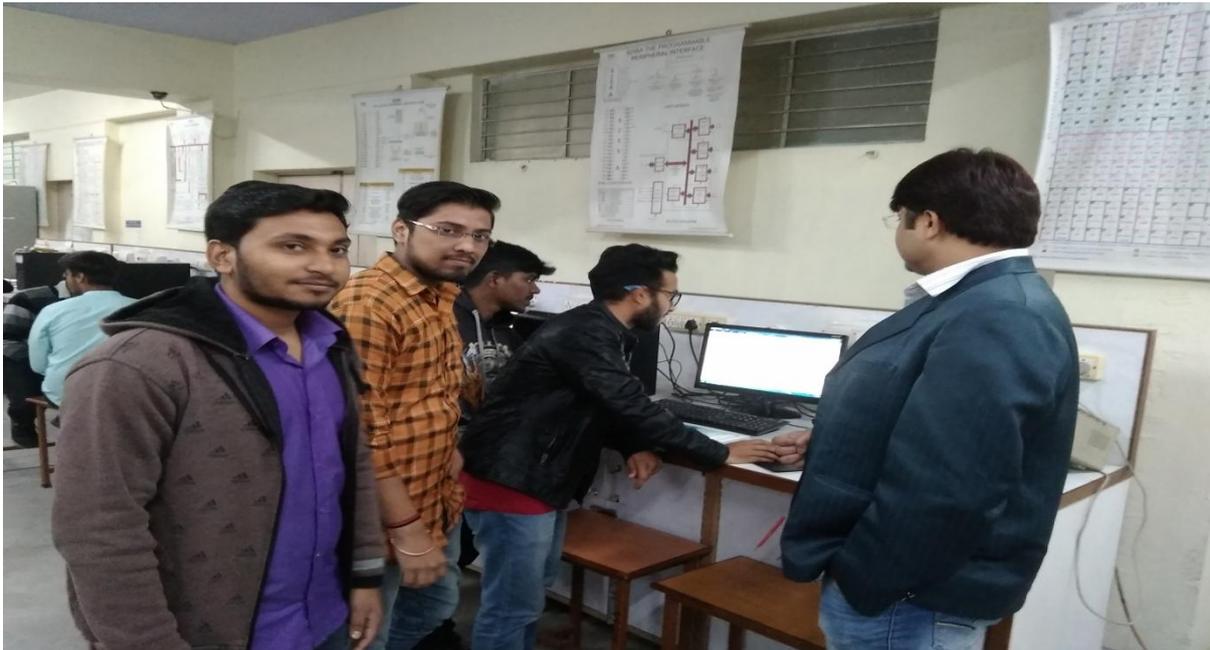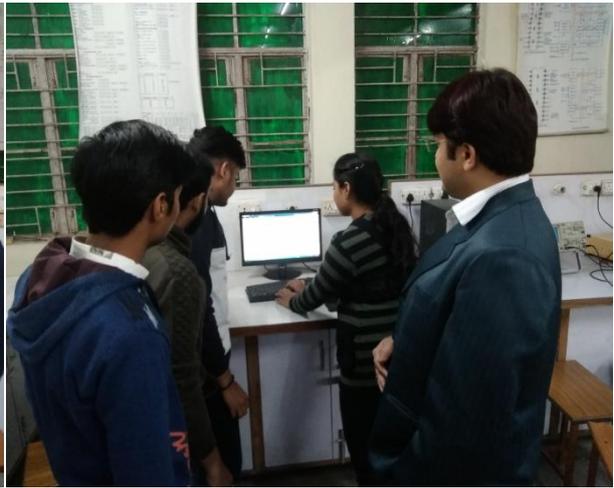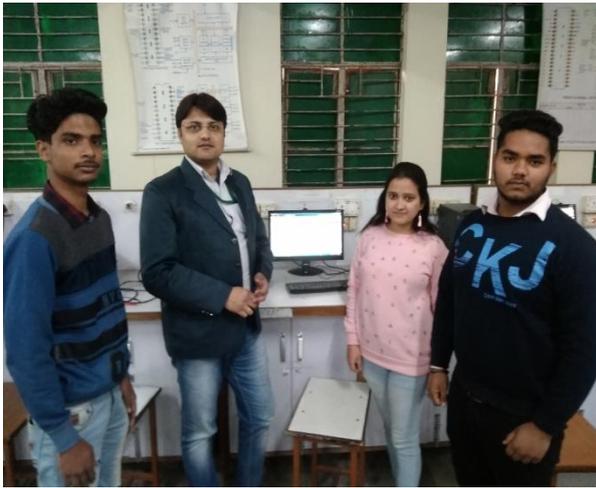
Activity Performed By: Students of EC 3rd Year

Faculty: Dhananjay Singh