

# VIDYA JYOTHI INSTITUTE OF TECHNOLOGY HYDERABAD

II Year B.Tech. ECE I-Sem

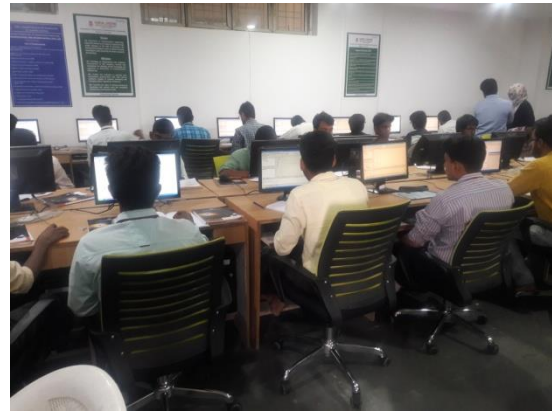
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## BASIC SIMULATION LAB

### Course Outcomes:

| A13482 | Course Outcomes  |
|--------|--|
| 1      | To Quantify and verify the various operation on signals.             |
| 2      | To Analyze and implement the convolution and correlation on signals. |
| 3      | To understand and analyze the transforms on signals and systems.     |
| 4      | To study and implement the noise removal on periodic signal.         |



### List of Experiments (Minimum of 12 experiments)

#### Using MatLAB

1. Basic operations on Matrices
2. Generation of various signals and sequences (Periodic and Aperiodic), such as Unit Impulse, Unit step, square, saw tooth, Triangular, Sinusoidal, Ramp, Sinc.
3. Operations on Signals and Sequences such as Addition, multiplication, scaling, Shifting, Folding, computation of Energy and average power.
4. Finding the Even and Odd parts of Signal/sequence and Real and imaginary parts of signal.

5. Convolution between signals and sequences.
6. Auto correlation and cross correlation between signals and sequences.
7. Verification of Linearity and Time Invariance Properties of a given continuous/Discrete system.
8. Computation of unit sample, unit step and sinusoidal responses of the given LTI system and verifying its physical reliability and stability properties.
9. Gibbs Phenomenon.
10. Finding the Fourier Transform of a given signal and plotting its magnitude and phase spectrum.
11. Waveform synthesis using Laplace Transform.
12. Locating the Zeros and Poles and plotting the Pole-Zero maps in S plane and Z-plane for the given transfer function.
13. Generation of Guassian noise (Real and complex), Computation of its mean, M.S. value and its Skew, Kurtosis, and PSD, probability distribution function.
14. Sampling Theorem Verification.
15. Removal of noise by Autocorrelation / Cross correlation.
16. Extraction of Periodic signal masked by noise using correlation.
17. Verification of Weiner-Khinchine Relations.
- 18.** Checking a Random Process for Stationary in Wide sense.

**Equipment:**

|                                       |    |
|---------------------------------------|----|
| Computers                             | 30 |
| Matlab Licenced Software 1:1 required | 30 |

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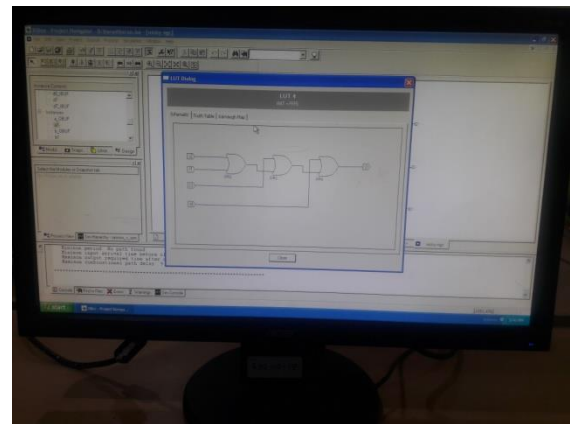
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## DSP and e - CAD LAB

### Course Outcomes:

| A16490 | Course Outcomes   |
|--------|---|
| 1      | To Implement and verify the Small scale integrated circuits |
| 2      | To Understand and evaluate the counter IC's                 |
| 3      | To prepare and summarize the different shift registers      |
| 4      | To Implement and verify the Memory and ALU operations.      |



### List of Experiments (Minimum of 12 experiments)

#### Part-A: DSP Lab Experiments

1. Generation of Sinusoidal waveform / Signal based on recursive difference equations.
2. To Find DFT/IDFT of given DT signal

3. Implementation of FFT of given sequence
4. Determination of Power Spectrum of a give signal (s)
5. Implementation of LP & HP FIR filter for a given sequence
6. Implementation of LP& HP IIR filter for a given sequence
7. Generation of DTMF signals
8. Implementation of I/D sampling rate converters
9. Noise removal: Add noise above 3 KHz and then remove, interference suppression using 400 Hz tone.
10. Impulse response of first order and second order systems.

**Part-B: e-CAD Lab Experiments**

1. HDL code to realize all the logic gates
2. Design of the 2 to 4 decoder
3. Design of 8 to 3 encoder (without and with parity)
4. Design of 8 to 1 multiplexer& 1 to 8 Demultiplexer
5. Design of 4 bit binary to gray converter
6. Design of 4-bit comparator
7. Design of full adder using 3 modeling styles
8. Design of flip flops SR, D, JK, and T
9. Design of 4 bit binary, BCD counters (synchronous/asynchronous reset)
10. Finite state machine design

**Equipment:**

|  |    |
|--|----|
| Computers                              | 30 |
| Matlab Licenced Software               | 30 |
| DSP starter kit TMS 320c Processor     | 8  |
| Code Composer Studio Software Licenced | 6  |
| CRO (0-20MHz)                          | 6  |
| Function Generators 0-1MHZ             | 6  |
| Mentor Graphics Tools licenced         | 40 |
| Cadence Tools licence                  | 10 |
| Xlinx Tools version 7.1i licenced      | 30 |
| FPGA/CPLD Boards                       | 15 |