KG REDDY College of Engineering & Technology

Name of the laboratory: Basic Simulation Lab

COURSE OBJECTIVES

1. Describe SCI LAB/OCTAVE and use it as a computation and visualization tool in the study of Signals, Systems and Stochastic process.
2. Solve Engineering problems using simulation tools.
3. Provide a foundation in use of this software's for project work and real time applications

COURSE OUTCOMES

At the end of the course, student will able to

CO 1: Describe programming & simulation for engineering problems

CO 2: Analyze various types of signals and sequences

CO 3: Sketch the spectrum of a given signal using SCILAB/OCTAVE

CO 4: Apply convolution and correlation operations on different signals.

CO 5: Write basic mathematical, electrical, electronic problems in SCILAB/OCTAVE

List of the equipment:

1. Computer System with latest specifications connected
2. Window Xp or equivalent
3. Simulation software-MAT Lab or any equivalent simulation software

List of experiments:

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 for Signals and sequences.
6. Auto Correlation and Cross Correlation for 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 realiazability and stability properties.
9. Gibbs Phenomenon Simulation.
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 Gaussian noise (Real and Complex), Computation of its mean, M.S. Value and Its Skew, Kurtosis, and PSD, Probability Distribution Function.
14. Verification of Sampling Theorem.
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 Stationarity in Wide sense.