JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA – 533 003, Andhra Pradesh, India
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

II Year I Semester		L	T	P	C
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	SKILL ORIENTED COURSE **DESIGN OF ELECTRICAL CIRCUITS USING ENGINEERING SOFTWARE TOOLS**				

Preamble:
The aim of the course is to simulate various theorems and resonance. Also to determine self and mutual inductance of a magnetic circuit, parameters of a given coil through simulation.

Course Objectives:
- To Learn the fundamentals of MATLAB Tools
- To generate various waveform signals and sequences
- To verify and simulate various electrical circuits using Mesh and NodalAnalysis
- To verify and simulate various theorems
- To verify and simulate RLC series and parallel resonance.
- To determine self and mutual inductance of a magnetic circuit, parameters of agiven coil.

List of Experiments
(Any 10 of the following experiments are to be conducted)

Note: MATLAB/SMULINK fundamentals shall be explained during the first week before starting of the Lab course

1. Generation of various signals and sequences (Periodic and Aperiodic), such as unit Impulse, Step, Square, Saw tooth, Triangular, Sinusoidal, Ramp.
2. Operations on signals and sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy, and Average Power
3. Verification of Kirchhoff's current law and voltage law using simulation tools.
4. Verification of mesh analysis using simulation tools.
5. Verification of nodal analysis using simulation tools.
6. Determination of average value, rms value, form factor, peak factor of sinusoidal wave, square wave using simulation tools.
7. Verification of super position theorem using simulation tools.
8. Verification of reciprocity theorem using simulation tools.
9. Verification of maximum power transfer theorem using simulation tools.
10. Verification of Thevenin's theorem using simulation tools.
11. Verification of Norton's theorem using simulation tools.
12. Verification of compensation theorem using simulation tools.
13. Verification of Milliman's theorem using simulation tools.
14. Verification of series resonance using simulation tools.
15. Verification of parallel resonance using simulation tools.
16. Verification of self inductance and mutual inductance by using simulation tools.

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Course Outcomes:

At the end of the course, student will be able to

- write the MATLAB programs to simulate the electrical circuit problems
- simulate various circuits for electrical parameters
- simulate various wave form for determination of wave form parameters
- simulate RLC series and parallel resonance circuits for resonant parameters
- simulate magnetic circuits for determination of self and mutual inductances