AMITY UNIVERSITY
UTTAR PRADESH

Course Title: Advanced Simulation Lab
Course Code: ECE633
Credit Units: 2
Course Level: PG

L	T	P/ S	SW/F W	TOTAL CREDIT UNITS
0	0	4	0	2

Course Objectives: The objective of this course is to help the student explore LabVIEW environment while building simple electronics engineering applications. Students receive hands-on experience in measuring, controlling, and simulating physical phenomena in a virtual environment.

Prerequisites: Basic electronic circuit knowledge.

List of Laboratory Experiment

1. Create a VI to perform various arithmetic operations such as – addition , subtraction, multiplication, division, power, square root based on user input. Make use of tab control and case structure.
2. Create a VI to generate 100 samples of simulated temperature data, save it in an array and display this data on a graph. Also find min, max and average of the data.
3. Create a VI to simulate series RLC circuit. Plot the graph of current with respect to change in frequency. Also verify the value of resonant frequency with theoretical value.
4. Create a VI to simulate a 4-bit ADC.
5. Create a database of students (Name, Roll No., CGPA, and Semester) in MS Excel. Create a VI to read the excel file and sort the database with respect to any chosen field.
6. Create a VI to simulate vending machine.
7. Create a VI to display the time elapsed (in hh:mm:ss) since the motor (simulated by a switch) is turned ON using time delay function. Shut it off automatically after 10mins.
8. Create a VI to read .wav file and generate the audio waveform through sound card.
9. To measure the signal strength of acoustic signal using NI Speedy and turn on the LED on the module if signal strength is above threshold.
10. To obtain RGB pixel value of given image

Student Learning Outcomes:

By the end of this course student will be able to

- Demonstrate the basic principles of computer programming and their application to solve engineering problems.
- Design VI's & integrate sub VI's to simulate basic electronic circuits.
- Perform data acquisition & data analysis using LabVIEW environment.

Pedagogy for Course Delivery: The instruction is done in a traditional lecture format as well as in the form of coaching student groups through their various assignments and projects. Small class sizes allow instructor to engage the students on a one-on-one basis. Hands-on approach is emphasized throughout the course. Students continually use the computers during instruction times. Team work among the students are encouraged and under certain circumstances required.

Assessment/ Examination Scheme:

Theory L/T (%)	**Lab/Practical (%)**	**Total (%)**
NIL	100%	100%

Theory Assessment (L&T):
CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; A: Attendance

Lab Assessment (P):
Theory Assessment (L&T):

Continuous Assessment/Internal Assessment					**End Term Examination**
Components (Drop down)	Mid-Term Exam	Assignment	Viva	Attendance	
Weightage (%)	10%	7%	8%	5%	70%

A: Attendance, PR- Performance, LR – Lab Record, V – Viva. EE- External Exam,

Text & References:

- Robert H. Bishop, "Learning with LabVIEW " , Second Edition, 2001, ISBN-10: 0130325597.
- Jeffery Travis and James Kring, "LabVIEW for Everyone: Graphical Programming Made Easy and Fun", Third Edition, 2006, Prentice Hall, ISBN-0: 0131856723