DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

Course	ECE 30300 – Engineering Software Design
Type of Course	Elective for CmpE and EE programs
Catalog Description	The purpose of this course is to introduce a variety of software and hardware design topics to Electrical and Computer engineering students, with an emphasis on problem solving. Topics include the interfaces of sensors and actuators, Unix shell script programming, , LabVIEW graphic programming, as well as programmable logic controller (PLC) programming.
Credits	3
Contact Hours	Lecture 2: Lab: 2
Prerequisite Courses	ECE 20100, ECE 27000
Recommended Textbooks	1) M. Sobell, *A Practical Guide to Linux Commands, Editors, and Shell Programming*, Prentice Hall, current edition. 2) C. Green, *Learn How to Program and Troubleshoot Ladder Logic*, CreateSpace, current edition. 3) John Essick, Hands-On Introduction to LabVIEW for Scientists and Engineers: A practical Guide to sensors and actuators, Oxford University Press, current edition
Course Objectives	This course introduces a variety of advanced hardware and software subjects, including interfaces of sensors and actuators, Unix shell scripting, LabVIEW programming and PLC programming. Students are expected to design and test software programs in integrated software/hardware systems to solve advanced engineering problems.
Course Outcomes	On successful completion of this course, students should be able to 1. Understand the interfaces of sensors and actuators (1) 2. Understanding the theories and practices of ADC and DAC converters (1) 3. Test and evaluate software program for correctness, reliability, and efficiency. **(2)** 4. Use scripting languages to interact with the operating system. **(1)** 5. Execute software program within integrated software/hardware devices. **(1)**

	6. Programming using LabVIEW graphic environment (2)
	7. Design, program, and test a basic PLC system to meet a set of specifications. **(2)**

Lecture Topics	1. Bash commands and shell scripting
	2. Sensors, actuators, ADC/DAC converters.
	3. LabVIEW Programming
	4. LabVIEW Techniques of interfacing sensors and actuators
	5. Electric ladder diagrams
	6. PLC programming

Computer Usage	High

Laboratory Experience	High

Design Experience	High

Coordinator	Guoping Wang

Date	April 2022