

CLASS SYLLABUS

INTC 2471 Data Acquisition

12486 Lec 001

Schedule	Spring 2008 - Tuesday and Thursday – 7:05 pm to 9:45 pm
Instructor	Don Holden
Office Phone	223- 6225
e-mail address	dholden@austintx.com (I check for email often, and I will reply promptly.)
Web site	http://www.austincc.edu/dholden The web site will contain an up-to-date syllabus and your exercises.
Office Hours	Tuesday and Thursday 6:30 to 7:00, and by appointment.
Course Description	A study of the fundamentals of data acquisition, with an introduction to digital signal processing. Graphical interfacing, provided by LabView, leads to a consistent analysis of the Systems approach to filtering data.
Textbook:	Handouts from " <u>LabVIEW Basics 1: Introduction</u> " and " <u>Data Acquisition and Signal Conditioning</u> ", NI Course Manuals.
Course Format	This course is a combination of lecture and LabVIEW programming exercises. The exercises are available on the web site – those marked with * are reached through the “Basic LabView Course” link.
Course Rationale	Data acquisition is profoundly important in every specialty path in Electronic Technology. Whether it's semiconductor manufacturing, telecommunications, robotics, or automation - you will likely be acquiring both analog and digital data
Course Objectives/Outcomes	Define terms used to describe data acquisition ; program and operate LabView virtual instruments; and describe the purpose of signal conditioning..
Grading	Your grade is based upon two comprehensive examinations and a series of approximately 23 exercises. The weights of these activities in determining your final grade are: Exams 70%, Exercises 30 %. Standard letter grades will be used.
Class Policies	(A) Acts prohibited by the college for which discipline may be administered include scholastic dishonesty, including but not limited to cheating on an exam or quiz, plagiarizing, and unauthorized collaboration with another in preparing outside work. Academic work submitted by students shall be the result of their thought, research or self-expression. Academic work is defined as, but not limited to, test, quizzes, whether taken electronically or on paper; projects, either individual or group, classroom presentations, and homework. The penalty for any violation of this policy is withdrawal from the course. (B) Each ACC campus offers support services for students with documented physical or psychological disabilities. Students with disabilities must request

reasonable accommodations through the Office for Students with Disabilities on the campus where they expect to take the majority of their classes. Students are encouraged to do this three weeks before the start of the semester.

(C) **ATTENDANCE IS MANDATORY.** If you need to miss class due to your job requirements, check with me first. If you miss very many classes, without pre-arrangement, I will probably drop you. If you get hopelessly behind, it is **your** responsibility to withdraw on or before April 21, 2008.

(D) Each student is strongly encouraged to participate in class - questions are especially appreciated. Just about any topic in electronics is fair game, if time permits. Students will sometimes disagree with each other, and with the instructor. It is expected that faculty and students will respect the views of others when expressed in classroom discussions. The instructor will not, however, indicate agreement with a student when he feels that the student is technically incorrect. He will instead, respectfully agree to disagree.

Course Schedule

Week 1	1/14	Introduction	LabVIEW exercises - *Acquiring a Signal
Week 2	1/21	dB review. Time domain and Frequency domain	LabVIEW exercise – Noisy sine wave.
Week 3	1/28	Signals and Systems - Cascaded filters and amplifiers. Block Diagrams.	LabVIEW exercise – Build a square wave by summing harmonics LabVIEW exercise – study odd harmonics using spectral analysis.
Week 4	2/4	Signals and Systems Filters - Break frequency & Attenuation Slope, filter order	LabVIEW exercise - filters
Week 5	2/11	More on filters. Lo pass, Hi pass, Band pass, Band stop Temperature C -> F	More on filter exercise LabVIEW exercise – *Convert C to F
Week 6	2/18	Modular programming – Sub-VI, Intro to DAQ board, thermocouples	LabVIEW exercise – *Thermometer
Week 7	2/25	While loops, For loops	LabVIEW exercise – *Timed Temperature Traffic light exercise
Week 8	3/3	Mid-term Exam Feedback nodes and shift	LabVIEW exercise – *Accessing Previous Data

		registers	
	3/10	SPRING BREAK	
Week 9	3/17	. Arrays	LabVIEW exercise – *Array Exercise
		Making Decisions	LabVIEW exercise – *Square Root
		Structures	
Week 10	3/24	Integer&fractional representations, Convolution, 3pt lowpass and 3pt highpass	Binary-to-digital Exercise
Week 11	3/31	Sampling, antialias filters	B-to-D II exercise
		Moving average filters	LabVIEW exercise – *Temperature Monitor
Week 12	4/7	FIR, IIR, ARMA	LabVIEW exercise – *Temperature Running Average
		Chirp signals, Sub-band filters	LabVIEW exercise – *Graph Circle
			Chirp Exercise
Week 13	4/14	D/A - R/2R ladder	LabVIEW exercise – *Voltmeter
		A/D – Successive Approximation	LabVIEW exercise – *Measurement Averaging
			LabVIEW exercise – *Simple Data Logger
Week 14	4/21	Range, Resolution, and Code Width	LabVIEW exercise – DAQ 2-1
Week 15	4/28	More on aliasing	LabVIEW exercise – DAQ 4-1
		PID – Feedback Control	
Week 16	5/5	Review and Final exam	Final Exam 5/10