

MAE 5341 / 4312 - Control Systems Components
Syllabus for Fall 09

Instructor: Dr. Robert L. Woods office: room 304a cell phone 817 996 0707
e-mail: Woods@uta.edu office hours: TTh 2-3 pm

Textbook: professor's class notes available through Bird's Copy Center

Meeting time: TTh 3:30 – 4:50 pm room 221 Nedderman Hall

Prerequisites: Automatic Control Theory (MAE 4310 or ME 5303 or equivalent)

Goals for course: To consider the details and hardware required to implement control systems.

Key Assignments: Two of the three tests plus the final are designated as “Key Assignments” for ABET accreditation.

Course Content:

1. Multiport Modeling

systems concepts, port variables, impedance and gain, 1-port devices, 2-port devices
3-port devices, multiport examples
impedance matching of interacting multiports
impedance matching examples

Test 1

2. Control Systems Components

amplifiers	electronic, fluidic, thermic, mechanic
sensors and transducers	electronic, fluidic, mechanic, thermic
computation	addition, subtraction, gain change, multiplication, division
dynamic filtering	low-pass, high-pass, band-pass, notch, PD, PID
actuators and effectors	translational, rotational, effectors

Test 2

3. Control Systems Analysis

dynamic multiport servo systems (electronic, hydraulic, electro-hydraulic, hydro-mechanical)
case studies (idle speed control, fuel injection, transmission control)

4. Pulse Modulation Techniques

pulse width modulation
pulse frequency modulation
pulse height modulation
pulse-width pulse-height modulation

Test 3

Final