



**Course** EE 4310.001, Systems and Controls  
**Professor** Paul Deignan, Ph.D.  
**Term** Fall, 2016  
**Meetings** Monday & Wednesday: 8:30am – 9:45am, ECS-S 2.305

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### Instructor's Contact Information

**Office Location** ECS-N 3.926  
**Phone** (972) 883-6944  
**Email Address** [pbd130130@utdallas.edu](mailto:pbd130130@utdallas.edu)  
**Office Hours** Official: Tuesday and Thursday: 12:00pm – 3:00pm  
Unofficial: Whenever office door is open

### General Course Information

**Prerequisites** ENGR 2300, and (CE 3302 or EE 3302 or TE 3302).

#### Course Description

Introduction to linear control theory. General structure of control systems. Mathematical models including differential equations, transfer functions, and state space. Control system characteristics. Transient response, external disturbance, and steady-state error. Control system analysis. Performance, stability, root-locus method, Bode diagram, and Nyquist plot. Control system design. Compensation design using phase-lead and phase-lag networks.

#### Learning Outcomes

1. Determine if a closed loop system can track and disturbance reject
2. Sketch a root locus plot
3. Sketch a Bode plot and determine gain and phase margins
4. Use the Nyquist plot to determine closed loop stability
5. Find a state feedback controller

**Required Text** “Modern Control Engineering”, 5th ed., Ogata

**Suggested Software** [Matlab](#)

Date	Topic	Text	Assignment	Due
Aug 22	Introduction	1.1-5		
24	Mathematical Modeling of Control Systems	2.1-3		
29		2.4-7		Sep. 7
31	Mathematical Modeling of E-M Systems	3.1-3		
Sep. 7	Transient and Steady State Response Analysis	5.1-4		Sep. 19
12		5.5-6		
14		5.7-8		
19	The Root Locus Method	6.1-2		Sep. 26
21		6.3-5		
26		6.6-7		Oct. 3
28		6.8		
Oct. 3	<b>Review</b>			
5	<b>Exam I</b>		<b>CLO #1-2</b>	
10	The Frequency Response Method	7.1-2		Oct. 17
12		7.3-4		
17		7.5-6		Oct. 24
19		7.7-9		
24		7.9-10		Oct. 31
26		7.11-13		
31	<b>Review</b>			
Nov. 2	<b>Exam II</b>		<b>CLO #3-4</b>	
7	State Space Analysis	9.1-2		Nov. 14
9		9.3-4		
14		9.5		Nov. 28
16		9.6-7		
28	State Space Design	10.1-4		Dec. 7
30		10.5		
Dec. 5		10.6-7		
7	<b>Review</b>			
TBA	<b>Final</b>		<b>CLO #5</b>	

**Assignments are due at the beginning of class on the due date to eLearning.**

*These descriptions and timelines are subject to change at the discretion of the Instructor.*

## Course Policies

<b>Grading Criteria</b>	<p>Examinations are designed to assess fundamental comprehension and understanding rather than short term retention. The accumulated weighted points from quizzes and tests establish a point total to which grades are assigned by rank order in proportion corresponding to the mean distribution of grades.</p> <p>The historical grade distributions for EE 4310 are publically available and can be found at <a href="http://www.myEdu.com">http://www.myEdu.com</a>. Pluses/Minuses are taken at equal intervals within grade brackets for A/B and pluses only at the midpoint with the C bracket. Candidates for D or F according to the rank ordering will be adjusted to the next higher grade bracket if their total score exceeds 40% (for D from F) and 50% (for C from D).</p> <p>The weighting of the cumulative raw point totals is by:</p> <p>Homework: 10%  Exam I: 30%  Exam II: 30%  Final: 30%</p>
<b>Make-up Exams</b>	<p>Any excusal from a regularly scheduled test or assignment must comply with the policies of the University for excused absences. In particular the student is responsible for providing satisfactory evidence to the instructor to substantiate the reason for absence. Except in the case that the student seeks an excusal for religious holy days (below), if the absence is foreseeable, this evidence will be provided and acknowledged ahead of the excused absence. In the case of an emergency absence, the student will provide evidence to the instructor within three days for the absence to be excused.</p> <p>ODA tests will be administered two hours prior to the scheduled test time.</p>
<b>Late Work</b>	Not graded except in cases of university excused absences.
<b>Class Attendance</b>	Not taken. Attendance for administrative purposes is recorded by homework submission.
<b>Classroom Citizenship</b>	Please be respectful to your classmates by minimizing disturbances. Class time is prescheduled and should be considered to be analogous to a business meeting.
<b>Comet Creed</b>	<p>This creed was voted on by the UT Dallas student body in 2014. It is a standard that Comets choose to live by and encourage others to do the same:</p> <p>“As a Comet, I pledge honesty, integrity, and service in all that I do.”</p>
<b>UT Dallas Syllabus Policies and Procedures</b>	<p>The information contained in the following link constitutes the University’s policies and procedures segment of the course syllabus.</p> <p>Please go to <a href="http://go.utdallas.edu/syllabus-policies">http://go.utdallas.edu/syllabus-policies</a> for these policies.</p>

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