TEXAS A&M UNIVERSITY

SYLLABUS

Course title and number	**Linear Multivariable Systems, ECEN 605**
Term	Fall 2017
Meeting times and location	To be arranged (3 hours lectures, 1 hour lab)

Course Description and Prerequisites

The course deals with single input single output systems, multivariable systems, the linear servomechanism problem, and linear quadratic optimal control. The emphasis is on linear systems and a thorough coverage of classical linear control theory and modern state space control theory is given. It is assumed that the student has had an undergraduate course in Control Systems and has a working knowledge of a programming language such as Matlab. A detailed listing of topics and a weekly schedule follows:

1. Single input Single output systems

1.1 Laplace Transform Review

1.2 Linear Algebra Review

1.3 Static and Dynamic Models

1.4 State Variable and Transfer Function Models

1.5 Stability and Stabilization

1.6 Tracking, disturbance rejection and pole placement

1.7 Classical control, Nyquist criterion and stability margins

2. Multivariable Systems

2.1 Realization Theory

2.2 State Feedback

2.3 Observers

3. Linear Servomechanism problem

3.1 Problem formulation

3.2 Internal models

3.3 Existence conditions

3.4 Closed-loop structure

4. Linear Quadratic Optimal Control

4.1 H_2 optimal control Linear Quadratic Regulator (LQR)

4.2 H_∞ optimal control

Weekly Schedule of Topics	
Week 1	Laplace Transform Review
Week 2	Linear Algebra Review
Week 3	Static and Dynamic Models
Week 4	State Variable and Transfer Function Models
Week 5	Stability and Stabilization
Week 6	Tracking, disturbance rejection and pole placement
Week 7	Classical control, Nyquist criterion and stability margins
Week 8	Realization Theory
Week 9	State Feedback
Week 10	Observers
Week 11	Linear Servomechanism problem
Week 12	Internal models
Week 13	H_2 optimal control Linear Quadratic Regulator (LQR)
Week 14	H_∞ optimal control

Instructor Information

Name	S.P. Bhattacharyya
Telephone	979-845-7484
Email	spb@tamu.edu
Office hours	2-3pm T-R
Office location	244C WERC

Textbook and/or Resource Material

References: - Linear Systems, T. Kailath,
- Linear Systems, P. J. Antsaklis and A. N. Michel.

Grading Policies

Assignments and Tests

Homework will be assigned approximately every two weeks. (Total 7 assignments)

Tests will be administered once every four weeks (Total 3 tests)

- All Homeworks are required.
- There will be three tests
- Homework grade is worth 60%.
- Test grade is worth 40%.

Grading Scale

Standard Letter Grading Scale:
A = 90-100
B = 80-89
C = 70-79
D = 60-69
F =<60

Attendance and make-up policies: Please refer to **http://student-rules.tamu.edu/rule07**

Americans with Disabilities Act (ADA)

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, currently located in the Disability Services building at the Student Services at White Creek complex on west campus or call 979-845-1637. For additional information, visit http://disability.tamu.edu.

Academic Integrity

For additional information please visit: http://aggiehonor.tamu.edu

"An Aggie does not lie, cheat, or steal, or tolerate those who do."