Course Syllabus for

MECH 3V95 – Mechatronics

Section	Days	Time	Room	Instructor	TA
001	M	11:30-1:10 pm	SPN 1.121	Ann Majewicz	Ziheng Wang
302 (Lab)	T	1:00-3:45 pm	SPN 1.115	TBD	
301 (Lab)	W	1:00-3:45 pm	SPN 1.115		Ziheng Wang

Professor Contact Information

Dr. Ann Majewicz
Office: ECSN 2.218
Office Hours: Monday, 10:00-11:00 am
Phone: 972-883-4426
Email: Ann.Majewicz@utdallas.edu

Teaching Assistant Contact Information

Name: Ziheng Wang
Office: SPN 1.115
Office Hours: TBD
Email: Ziheng.Wang@utdallas.edu

Course Pre-requisites, Co-requisites, and/or Other Restrictions

Pre-requisite: MECH 4310
Co-requisite: MECH 3v95: Circuits and Applied Electronics

Course Description

The purpose of this course is to give students a broad understanding of the design and control of mechatronic systems to meet specified requirements. Course topics include: system modeling, basic electronics, sensors and signal processing, actuators (types, selection, and control), microcontrollers (A/D and D/A conversion, software design, communication and peripherals), and the overall mechatronic design process. This course includes a laboratory component and team-based final project competition.

Course Objectives and Topics

Introduce theory, design, analysis, and implementation of mechatronic systems. The learning objectives/outcomes for this course are as follows:
- Understand the function and application of mechatronic components (e.g., sensors, actuators, microprocessors, etc.).
- Derive theoretical models of simple mechatronics systems while understanding modeling benefits and limitations.
- Develop teamwork and project management skills for mechatronic design.

Required Textbook and Supplies

Authors: Carryer, J. Edward, Ohline, R. Matthew, Kenny, Thomas W.
Title & Edition: Introduction to Mechatronic Design, 1st Edition
ISBN-13:   9780131433567

And additional recommended text is:

Authors: Bolton, William
Title & Edition: Mechatronics, 5th Edition
ISBN-13:   9780273742869

It is strongly suggested that you use a personal laptop for this course. The software used in this course includes: Microsoft Office (Word, Excel, Power Point), Matlab, and Multisim. These can be purchased from the UTD Technology Store (http://www.utdtechstore.com/).

All software is also available in the TI Innovation Lab (SPN 1.115).

Notes, supporting material, and other resources will be posted on eLearning.

Important Dates

MLK Day (no classes):   January 16
Last day to withdraw without "W":   January 25
Spring Break (no classes):   March 13-18
Last day to withdraw with "W":   March 30
Last day of classes: April 30
Finals week: May 2-8

Course Structure and Schedule

In MECH 3v95, you will attend one 1-hour and 40-minute class sessions each week, which will take place in **SPN 1.121** and well as one 3 hour laboratory session which will take place in **SPN 1.115.**

The following is a *tentative* schedule of class topics. These dates are subject to change. It is your responsibility to keep up with any changes.

Week	Lecture	Lab	Topic(s)	Laboratory
1	1-9	1-10 1-11	Overview of Course, Systems Concepts, Basic Electronics Review	Basic Electronics and Measurements Lab
2	1-16	1-17 1-18	**NO CLASS**	Launchpad Intro
3	1-23	1-24 1-25	Basic Electronics Review and Microprocessors	Energia
4	1-30	1-31 2-1	Programming (state machines)	Code Composer Transition Lab
5	2-6	2-7 2-8	Communication, Peripheral, and Sensors	State Machine Lab
6	2-13	2-14 2-15	Signal Processing + Filtering	Sensing Lab
7	2-20	2-21 2-22	I/O, D/A and A/D Voltage Regulators and Power	Actuators Lab: Build
8	2-27	2-28 3-1	Actuators: DC motors, Solenoids, Stepper Motors *(MIDTERM, 3-3)*	**Project Concept Presentations**
9	3-6	3-7 3-8	Motor Control: Theory, Hardware, and Software + Other Actuators	Actuators Lab: Control
10	3-13	3-14 3-15	**SPRING BREAK NO CLASS**	**NO LAB**
11	3-20	3-21 3-22	Other Actuators Project planning and Design Tips	**Project Critical Design Review**
12	3-27	3-23 3-24	Fault Finding and Common Bugs System Modeling and Control	Final Project
13	4-3	4-4 4-5	System Modeling and Control	Final Project
14	4-10	4-11 4-12	System Modeling and Control	Final Project
15	4-17	4-18 4-19	Project Work Time (*in lab*)	Final Project **Operational Check-off**
16	4-24	4-25 4-26	**PROJECT COMPETITION**	Final Exam Review Project Clean-up
17	Follow university schedule		**Final Exam**	

Grading Policy

[**35%**] **Exams and Quizzes**: There will be a midterm and final exam. Throughout the course, there may quizzes, either in class, or on eLearning, which combined account for 30% of the exam/quizzes grade. Grades for the lowest quiz will be dropped. Make-up exams will only be allowed for the cases of illness, participation in a university-sponsored event (e.g., athletics), or under unusual circumstances. For all cases, you are required to provide proper documentation.

[**30%**] **Homework and Laboratory Assignments**: There will be weekly, written homework laboratory completion worksheets or reports. These deliverables will be graded based on completeness, correctness, and legibility. *Late assignments will not be accepted under any circumstances and the lowest homework grade will be dropped. All laboratory deliverables are required – no exceptions.*

[**35%**] **Final Project**: The final design project will be graded on (1) a concept presentation, (2) a critical design review, (3) a demonstration of an operational system, (4) participation in the class competition, and (5) a final project report. The class demo day will be on **Monday, April 24th from 11:30am to 1:10pm in the ECSN Foyer,** and will be open to the public, including UTD faculty and students. The competition grade will be determined by performance during the event as well as an evaluation by a panel of impartial judges.

You have five business days to appeal any grade after being assigned.

Your final grade will be rounded to the nearest whole number, based on the following ranges:

	Plus (+)		Minus (-)
A	100 - 97	96 - 93	92 - 90
B	89 - 87	86 - 83	82 - 80
C	79 - 77	76 - 73	72 - 70
D	69 - 67	66 - 63	62 - 60
F		59 and below	

Course & Instructor Policies

Email <u>must be sent from your UTD email account</u> to the UTD email address of the instructor. Emails related to homework submissions should be addressed to both the instructor and TA.

The use of laptop computers, tablets, cell phones, or other electronic devices are ***not*** allowed during lectures or exams, unless required for the activity.

Academic dishonesty will not be tolerated. Students may discuss homework together but must submit their own work, while naming classmates that were also consulted. All suspected cases of academic dishonesty will be sent to the Office of Judicial Affairs (see http://www.utdallas.edu/deanofstudents/managing/). If it is determined that academic dishonesty occurred, you will receive a grade of **F** in this course.

For a full list of university policies, please visit http://go.utdallas.edu/syllabus-policies

THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE AT THE DISCRETION OF THE INSTRUCTOR.