

Course Title	Mechatronics MECH 4346 (Sec-2), CRN: 26836 (Spring-2021): Credit: 3
Instructor	Dr. Arifur R. Khan (arkhan@utep.edu) Office hours (Online): Anytime through MS Team (Appointment required)
TA	TBD
Class schedule	TR 4:30-5:50pm, Online through BB (January 19 to May 06, 2021)
Course Prerequisite	MECH 3345 with a C or better.
Course Description	Mechatronics requires knowledge of Sensors, Actuators, Circuits, Microcontrollers and Programming to build and run a machine for a specific purpose. This type of understanding and experiences are appropriate for the students of Electrical, Mechanical, Control, Industrial, Computer, System, Spacecraft, and Aerospace Engineering, etc.
Course Objective	This course educates students to be confident in mechanical systems with sensors and actuators powered by electrical and electronic systems controlled by computers (microprocessor) run by programming codes. At the end of this course, the typical student will understand how a machine works under different conditions for different purpose and will be able to design, implement and build Mechatronics system. This course will also improve the ability to identify, analyze and solve engineering problems using basic science and engineering knowledge, human intuition and instinct.
Course Topics	<ul style="list-style-type: none"> • Introduction of Mechatronics • Electrical/Electronic Components for Mechatronics System • Sensors • Electric Actuators • Programmable Logic/Motion Controllers (Arduino/LabVIEW Based) • Hands on Projects (will be assigned in the class for each group) • Arduino/MATLAB/LabVIEW Programming (Project related)
Reference	<ol style="list-style-type: none"> 1. Mechatronics with Experiments by Sabri Cetinkunt (Second Edition), published by Willy (EBook is available in the UTEP Library) 2. Mechatronics with Measurement System, David G. Alciatore and Michael B. Histan, Mac Graw Hill (pdf version available online) 3. Additional Reference materials (notes, projects, web links, etc.) may be handed out in class, also available in Blackboard.
Software in class	iClicker (Attendance, quiz, etc.), MATLAB, Arduino, LabVIEW
Student's assessment	<ol style="list-style-type: none"> 1. Class Performance: 30% [Attendance and Class quiz through iClicker] 2. Midterm-1: 20% 3. Online (Bb) Midterm-2: 20% Final exam will replace the worst midterm. 4. Online (Bb)Final Exam: 20% 5. Project (Midterm and Final presentation and report): 30% (4 students group) [Report (words):25%, Hands On:50%, Group final presentation (ppt.):25%] 6. Final exam (Online, Bb) is optional. It will replace the worst midterm. 7. Grace point: 1% if it improves the current grade to the next better level.
Students grading	A= $\geq 90\%$; B= $< 90\%$ and $\geq 80\%$; C= $< 80\%$ and $\geq 70\%$; D= $< 70\%$ and $\geq 60\%$; F= $< 60\%$ (UTEP Standard)
Tools in Class/Lab	<ol style="list-style-type: none"> 1. Scientific calculator, Laptop, Pad, e-book, can be used as problem solving tools in class. 2. Project accessories (Arduino, components, etc.)

Necessary ITEMS for the Spring 2021 semester

The image shows a screenshot of a course registration form with several red annotations. The 'Institution' field is circled and contains 'The University of Texas at El Paso'. The 'Course Discipline' dropdown is set to 'Engineering'. The 'Course Name' field is circled and contains 'Mechatronics'. The 'Start Date' is '1/19/2021' and the 'End Date' is '5/8/2021'. The 'Course ID' field is circled and contains 'MECH 4346'. The 'Term' field is circled and contains 'CRN 26836'. The 'Meeting Times' section has 'Tuesday' and 'Thursday' selected, both at '4:30 PM'. Red arrows point to the 'End Date' and 'Term' fields.

Please note, Course ID and CRN 26836, Date, TR and time 4:30 pm in the picture left.
Link: <https://app.reef-education.com/#/courses/add>

Depending on the project assigned, student (in group) should buy components, electronics, and necessary items to build their project.

Date		Class Topic <i>(subject to change)</i>	Home practice
Week 1	1/19	Meet and Greet, Introduction to Mechatronics, Course objective discussion, Team formation	MEET and GREET
	1/21	Introduction to Mechatronics: Details, Teaming	Team formation
Week 2	1/26	Introduction to Mechatronics: Details, Group and Project finalization	Home practice for random Class quiz.
	1/28	Electrical/Electronic Components for Mechatronics System	Home practice for random Class quiz.
Week 3	2/2	Electrical/Electronic Components for Mechatronics System	Home practice for random Class quiz.
	2/4	Electrical/Electronic Components for Mechatronics System	Home practice for random Class quiz.
Week 4	2/9	Electrical/Electronic Components for Mechatronics System	Home practice for random Class quiz.
	2/11	Electrical/Electronic Components for Mechatronics System	Home practice for random Class quiz.
Week 5	2/16	Details about Sensors and it usages	Home practice for random Class quiz.
	2/18	Details about Sensors and it usages	Home practice for random Class quiz.
Week 6	2/23	Details about Sensors and it usages	Home practice for random Class quiz.
	2/25	Details about Sensors and it usages	Home practice for random Class quiz.
Week 7	3/2	Midterm-1 Exam Review Online Exam time: 6 pm to 11:59 pm	Camera activated Lockdown Browser
	3/4	Midterm Project Presentation	Home practice for random Class quiz.
Week 8	3/9	Electric Actuator and its application	Home practice for random Class quiz.
	3/11	Electric Actuator and its application	Home practice for random Class quiz.
Spring Break (March 15-19)			
Week 9	3/23	Electric Actuator and its application	Home practice for random Class quiz.
	3/25	Electric Actuator and its application	Home practice for random Class quiz.
Week 10	3/30	Programmable Logic Controller (Arduino/ LabVIEW based)	Home practice for Class quiz.
	4/1	Programmable Logic Controller (Arduino/ LabVIEW based)	Home practice for Class quiz.

Week 11	4/6	Programmable Logic Controller (Arduino/ LabVIEW based)	Home practice for Class quiz.
	4/8	Programmable Logic Controller (Arduino/ LabVIEW based)	Home practice for Class quiz.
Week 12	4/13	Midterm-2 Exam Review Online Exam time: 6 pm to 11:59 pm	Camera activated Lockdown Browser
	4/15	Online Final Project Presentation (2 groups)	Home practice for Class quiz.
Week 13	4/20	Online Final Project Presentation (2 groups)	Home practice for Class quiz.
	4/22	Online Final Project Presentation (2 groups)	Home practice for Class quiz.
Week 14	4/27	Online Final Project Presentation (2 groups)	Home practice for Class quiz.
	4/29	Online Final Project Presentation (2 groups)	Home practice for Class quiz.
Week 15	5/4	Online Final Project Presentation (2 groups)	Grade Declaration on BB
	5/6	Final exam Review (Optional)	No Quiz, No Attendance
Week 16	5/7	Final Exam: 6:00-11:59 pm (Online, Bb)	Comprehensive and optional

Spring 2021: IMPORTANT DATES

Jan 18th Dr. Martin Luther King, Jr. Holiday – University Closed

Jan 19th Spring classes begin

Jan 19-22nd Late Registration (Fees are incurred)

Feb 3rd Spring Census Day

Note: This is the last day to register for classes. Payments are due by 5:00 pm.

Feb 15th 20th Class Day

Note: Students who were given a payment deadline extension will be dropped at 5:00 pm if payment arrangements have not been made.

Feb 19th Graduation application deadline for degree conferral

Mar 15-19th Spring Break

Mar 31st Cesar Chavez Holiday – no classes (*TENTATIVE*)

Apr 1st Spring Drop/Withdrawal Deadline

Note: Student-initiated drops are permitted after this date, but the student is not guaranteed a grade of W. The faculty member of record will issue a grade of either W or F.

Apr 2nd Spring Study Day

Apr 16th Deadline to submit candidates' names for commencement program

May 6th Spring – Last day of classes

May 7th Dead day

May 10-14th Spring Final Exams

May 15-16th Spring Commencement

Grade Calculation (Example)

Class performance (30%) : iClicker Quiz and Attendance

Points for each quiz: 1.5 (almost each class)

Points for each attendance: 0.5 (almost each class)

Student's score (for example): $\frac{72(\text{Student score}) \times 30\%}{85(\text{out of total score})} = 25.41\%$

Midterm-1 (20%)= 19 (student's score)/20 (out of total score)

Midterm-2 (20%)= 16 (student's score)/20 (out of total score)

Projects (Midterm and Final, 30%)= 28 out of 30.

Total Score without final exam:

Class performance= 25.41 out of 30

Midterm-1 = 18 out of 20

Midterm-2= 16 out of 20

Projects= 28 out of 30

Total= 87.41 (Grade B)

If any student likes to improve the grade, it can be done by joining the final exam.

Score in the final exam (for example): 19 out of 20.

Between the two midterms, the worst will be dropped or ignored if Final exam score is higher than any of the midterm scores. If not, final exam score will be ignored.

New score calculation after the Final Exam completed

Total Score after final exam:

Class performance= 25.41 out of 30

Midterm-1 = 18 out of 20

~~Midterm-2= 16 of 20~~ (dropped/ignored)

Final exam: 19 out pf 20

Projects= 28 out of 30

Total= 90.41 (Grade A)

S/U option (If any student like to have S/U option instead of regular (A,B,C,D, F) grading, depending on the availability)

Regular grade	S/U grade
A, B, C or D	S
F	U

Addendum to Syllabi – Beginning Spring 2021

ACES & Tutoring Center

Please note there are tutoring services available in the ACES center. Tutoring is free to you; the Department pays them. If tutors are not used, the Department may stop funding them. Check the schedule of the tutors and make use of the services. For more details visit the

ME Advising Blackboard -> cc mech acadav: MECH Academic Advising -> Tutoring & Resources

At the link you can find tutor schedules, location of the ACES center and the list of tutors available. For more information send email to METutors@utep.edu

Academic Honesty

During exams and quizzes, you are not allowed to use any form of Wi-Fi enabled electronic device, including cell phones or other electronic communication devices or methods (wrist watches, earbuds, etc.). No wrist watch or other electronic device may be worn. Calculators and watches may be subject to inspection. You may be asked to temporarily remove glasses to allow for their inspection.

You may not bring backpacks, hats, bulky coats or hoodies into the exam room. Lockers are not available at the exam site so plan and leave your belongings in a secure location. You may NOT sit them in a corner of the exam room.

You must show your work for all problems. You must use the paper provided by the instructor. If no work is shown you may not receive credit. After the exam, the instructor may require you to explain how you solved a problem on the exam. If you refuse to or cannot explain your work you may be subject to disciplinary action.

No electronic version of the book, loose paper print-outs of the book or extra sheets of paper of any kind are allowed unless explicitly mentioned in writing by the instructor. As a part of the zero-tolerance policy, if you have a cellphone or other electronic device capable of communication on your person; or if any proctor sees or hears any electronic device during the exam or if you share your work with someone else, you will be reported to the proper authorities and you may receive a zero on the exam or an F in the class. Other actions including suspension may also be pursued.

No one will be allowed to leave the room during an exam. This includes restroom breaks.

University approved recording devices may be located at various locations in the room and may be out of sight of the students. These recordings will be managed according to the UTEP approved regulations for such media. The instructor may create a record of your activity during the exam and may take photographs of your work during the exam.

If you are suspected of scholastic dishonesty you may or may not be directly confronted about your conduct by the instructor or proctor. You will however, be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) and your exam may not be admissible. Your grade in the class may not be available until OSCCR makes a final ruling, this may adversely impact your ability to enroll in other classes.

If you arrive more than 15 minutes late to an exam, you will not be allowed to take the examination.

There will be no makeup exams administered. If you have a university approved excuse, your instructor will have a process for determining how to handle the missing grade outlined in the syllabus. However, no makeup exams will be given.

If you miss more than one exam, the instructor may choose to administratively drop you from the class. This may adversely impact a visa and financial aid.

No food or drink may be brought into the examination room.

Departmental policy allows for the use of assigned seats. All students must present their UTEP issued ID prior to and during every exam and may be required to sign in. Not having a UTEP issued ID when asked will result in forfeiture of the exam. No other IDs will be accepted. Scholastic dishonesty on homework, lab assignments and all other class assignments will be held to the same standards and requirements of academic honesty as quizzes and exams.

Class Attendance Policy

Attendance is mandatory. Anyone with 5 or more absences will be dropped from the class. A drop for not attending will count toward the State Allowed Six Drop Limit. If you are failing the class at the time of the drop you may also be given a WF designation. Be advised that a drop could adversely impact visa status, financial aid and other programs.

As per UTEP rules, you may be asked to show a UTEP ID at any time during class. Anyone who is present and not registered in the class will be subject to disciplinary action unless the instructor gives prior approval.

Excused Absence for Exams

The UTEP catalog allows Exam Absence to be excused ONLY for University-Recognized Activities and very specific other situations. Medical absence is NOT allowed in the UTEP catalog. For consistency with the catalog, students will NOT be excused from exams due to illness.

Harassment Policy

The University (see Handbook of Operating Procedures 1.2.2.4) has a zero-tolerance policy for harassment. Engagement in any behavior considered harassment will be reported to the proper authorities. In addition to generally understood forms of harassment, the department also treats the following behavior as harassment:

- Repeated emails and/or calls regarding subjects that have already been addressed. Once a decision has been made or a question answered, a student who continues to ask the same question will be given a warning by the recipient of the email/call. If the student continues, the behavior will be reported. Questions that seek understanding of course material are not harassment; but repeated questions about a grade or an administrative decision are.
- Grades are NOT negotiable, ever. If you believe a grading mistake has been made, you must follow the process described in the UTEP catalog. Any request for a grade elevation that is NOT based on a mistake is considered harassment and will be reported immediately.
- Remaining in an office after the occupant requests you leave is considered harassment and potentially threatening. You will be reported immediately without warning and depending on the severity, may be reported to law enforcement.

Similar behavior towards department staff, and student advisors will also be treated as harassment, including persistent phone calls, emails, and badgering. Department staff and student advisors are there to help students, and should be treated with due respect.