

Course Title	MECH 2342 Electro-Mechanical System (002), CRN: 25772 (Spring-2020): Credit: 3
Instructor	Dr. Arifur R. Khan (arkhan@utep.edu) Office hours (Online): Anytime through MS Team (Appointment required)
TA	TBD TBD
Online Class	TR: 1:30-2:50pm, Online through BB (Jan 19 - May 06, 2021)
Course Prerequisite	MATH 1312 (Calculus-II) or MATH 2313 or MATH 2326 (not concurrently)
Course Description	The Electro-Mechanical System requires basic knowledge of electrical circuits and circuit analysis, electronic device, the digital network, electromechanics, etc. appropriate for Electrical, Mechanical, Industrial, Civil, Chemical, Computer, Spacecraft Engineering, Aerospace Engineering, and Space science education, etc.
Course Objective	This course provides an ability to identify, formulate and solve engineering problems, related to electromechanical system by applying principles of engineering (electrical and mechanical), science and mathematics. This course also takes steps to improve the ability of students to apply engineering design; help students function effectively on a team; develop and conduct appropriate experimentation, analyze and interpret data; acquire and apply new knowledge as needed using appropriate learning strategies.
Course Topics	<ul style="list-style-type: none"> • Introduction (Power, Energy, Current, Voltage, Circuits) • Resistance, Capacitance and Inductance (RLC circuits) with Hands-on learning. • Transients and Sinusoidal Signal Analysis with numerical problems and simulation. • Diode, Bipolar and Field-Effect Transistors with Hands-on activities. • Magnetic Circuits and Transformers with numerical problems and simulations. • DC and AC Machines with numerical problems. • Computer Based Instrumentations (LabVIEW) with sensors.
Reference	<ol style="list-style-type: none"> 1. Electrical Engineering: Principle and Applications by A. R. Hambley. (4th, 5th or 6th Edition, Published by PEARSON, <u>no need to buy</u>) 2. Additional Reference materials (notes, projects, web links, etc.) may be handed out in class, also available in Blackboard.
Software in class	iClicker (Free software) Arduino, NI Multisim, LabVIEW,
Student's assessment	<ol style="list-style-type: none"> 1. Class performance: 30% [Attendance and Class quiz through iClicker] 2. Midterm Exam-1: 20% 3. Online (Bb) Midterm Exam-2: 20% Final exam will replace the worst midterm. 4. Online (Bb) Final Exam (Bb): 20% 5. Project (word report and video): 30% 6. Final exam 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, Cell phones (silent mode, no text/call) can be used as problem solving tools in class, not in the exams. 2. Arduino Kit and NI Multisim (link at the next page). Each student should arrange one set of Arduino Kit.

Necessary ITEMS for the Spring 2021

- **Each student is strongly recommended to register in iClicker**

Course Discipline:
Engineering

Course Name:
Electro-Mechanical System

Start Date:
1/19/2021

End Date:
5/6/2021

Course ID: *Optional*
MECH 2342

Term: *Optional*
CRN 25772

Meeting Times: *Optional*

Monday

Tuesday 1:30 PM

Wednesday

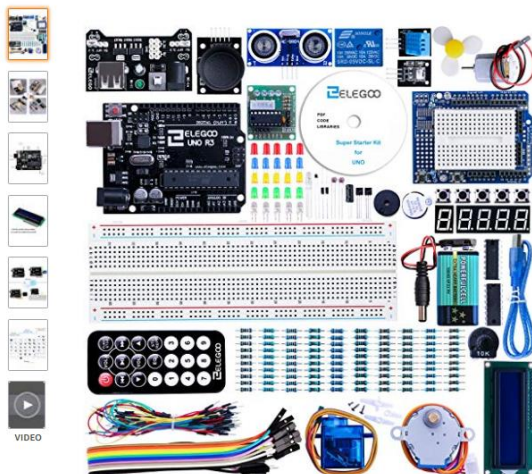
Thursday 1:30 PM

Please note, **MECH 2342, CRN: 25772.** and Meeting time (TR) in the picture left.

Link: <https://app.reef-education.com/#/courses/add>

- **Each student has to manage one set of Arduino Kit. If you are unable to manage, please contact your class instructor.**

https://www.amazon.com/ELEGOO-Project-Starter-Tutorial-Arduino/dp/B01D8KOZF4/ref=sr_1_3?ie=UTF8&qid=1547597906&sr=8-3&keywords=arduino+uno (Web access: 1/16/19.)



Roll over image to zoom in

Elegoo EL-KIT-003 UNO Project Super Starter Kit with Tutorial for Arduino by ELEGOO

817 customer reviews | 145 answered questions
#1 Best Seller in Single Board Computers

Price: \$35.00 & FREE Shipping. Details

- Free PDF tutorial (more than 22 lessons) and clear listing in a nice package
- The most economical way to starting Arduino programming for those beginners who are interested
- Lcd1602 module with pin header (not need to be soldered by yourself)
- This is the upgraded starter kits with power supply module, 9V battery with dc
- High quality kite with uno R3, 100 percent compatible with Arduino uno R3

Specifications for this item

Brand Name	ELEGOO
EAN	0746591610623
Item Weight	1.2 pounds
Model Number	EL-KIT-003
Number of Items	1
Part Number	EL-KIT-003
UNSPSC Code	32000000
UPC	746591610623

Date		Class Topic (subject to change)	NOTES
Week 1	1/19	Course Introduction, Syllabus. High-Impact Practices. Projects, Class quiz policy	MEET and GREET
	1/21	Voltage Current, Resistor, Ohms Law, Numerical problems, Hands On	Home practice for random class quiz
Week 2	1/26	Voltage Current, Resistor, Ohms Law, Numerical problems, Hands On	Home practice for random class quiz
	1/28	Voltage Current, Resistor, Ohms Law, Numerical problems, Hands On	Home practice for random class quiz
Week 3	2/2	Voltage Current, Resistor, Ohms Law, Numerical problems, Hands On	Home practice for random class quiz
	2/4	Project-1 Home automation using LDR	Project-1 submission due date 2/9 by 1 pm
Week 4	2/9	Voltage Current, Resistor, Ohms Law, Numerical problems, Hands On	Home practice for random class quiz
	2/11	Capacitor and Capacitance, Numerical Problems with examples	Home practice for random class quiz
Week 5	2/16	Capacitor and Capacitance, Numerical Problems with examples	Home practice for random class quiz
	2/18	Inductor and Inductance, Numerical Problems	Home practice for random class quiz
Week 6	2/23	Midterm-1 Review class (Resistor, Capacitor and Inductor)	Midterm-1 Exam (Online, BB) Camera activated Lockdown browser
	2/25	Transients and Sinusoidal Signal Analysis with numerical problems and simulation.	Home practice for random class quiz
Week 7	3/2	Transients and Sinusoidal Signal Analysis with numerical problems and simulation.	Home practice for random class quiz
	3/4	Diode, Numerical Problems, Hands on Graphical Presentation of I-V curve	Home practice for random class quiz
Week 8	3/9	Diode, Numerical Problems, Hands on Graphical Presentation of I-V curve	Home practice for random class quiz
	3/11	Transistor, Numerical Problems, Graphical Presentation, Hands-on	Home practice for random class quiz
Spring Break (March 15-19)			
Week 9	3/23	Transistor, Numerical Problems, Graphical Presentation, Hands-on	Home practice for random class quiz
	3/25	Project-2 (Logic gates) Transistor-Transistor-Logic (TTL) circuit	Project-2 submission due date 3/30 by 1 pm
Week 10	3/30	Midterm-2 Review class (Transient, Diode, Transistors, OpAmp)	Midterm-2 Exam (Online, Bb) Camera activated Lockdown browser
	4/1	Magnetic Circuits and Transformers with numerical problems	Home practice for random class quiz

Week 11	4/6	Magnetic Circuits and Transformers with numerical problems	Home practice for random class quiz
	4/8	Magnetic Circuits and Transformers with numerical problems	Home practice for random class quiz
Week 12	4/13	Magnetic Circuits and Transformers with numerical problems	Home practice for random class quiz
	4/15	Project-3 (Room temp. automation) Sensing temperature with Arduino codes	Project-3 submission due date 4/20 by 1 pm
Week 13	4/20	DC and AC Machines with numerical problems.	Home practice for random class quiz
	4/22	DC and AC Machines with numerical problems.	Home practice for random class quiz
Week 14	4/27	DC and AC Machines with numerical problems.	Home practice for random class quiz
	4/29	Project-4 (System automation) Distance measure with Arduino codes	Project-4 submission due date 5/4 by 1 pm
Week 15	5/4	Final Exam Review Class (Optional)	Grade declaration (Blackboard) No Quiz, No Attendance
	5/6	Final Exam Review Class (Optional)	No Quiz, No Attendance
Week 16	5/6	Final Exam:4:00pm-10:00pm (Online, Bb)	Comprehensive and Optional Camera activated Lockdown browser

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 31 st	Cesar Chavez Holiday – no classes (*TENTATIVE*)
Apr 1 st	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 2 nd	Spring Study Day
Apr 16 th	Deadline to submit candidates' names for commencement program
May 6 th	Spring – Last day of classes
May 7 th	Dead day
May 10-14 th	Spring Final Exams
May 15-16 th	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 (total 4 projects)= 7 + 6.5 + 7.5 + 7 = 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

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 of 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, or C	S
D or 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.