Course Title: MECH 2342 Electro-Mechanical System, CRN (Course Number): 21635
(Spring-2023): Credit: 3

Instructor: Callan Herberger, PhD Assistant Instructor
Email: caherberger@miners.utep.edu
Use in subject of email: MECH2342

Online Office hours: 12 pm-1 pm; (Zoom) Upon request and appointment

Teaching Assistant: Abedien, Tanvirul tabedien@miners.utep.edu

Class Schedule: Liberal Arts Building 107, MW: 1:30-2:50 pm
Possibility of a lecture conducted on Zoom during travel

Course Prerequisite: MATH 1312 (Calculus-II) or MATH 2313 or MATH 2326 (not concurrently)

Course Description: The Electro-Mechanical System requires basic knowledge on electrical circuits and circuit analysis, electronic devices, 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 systems 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:
- Introduction (Power, Energy, Current, Voltage, Circuits)
- Resistance, Capacitance, and Inductance (RLC circuits) with Hands-on learning, Transient signal analysis and numerical problems
- Diode and Bipolar Junction Transistors (BJT) with Hands-on learning.
- Signal Amplification and Operational Amplifiers (OpAmp).
- Magnetism, Magnetic Circuits and Transformers with numerical problems.
- DC and AC Machines with numerical problems and hands-on learning.
- Projects: Sensors, Logic gates, Signal capturing from sensors (Temperature and Distance) and displaying on computer.

Reference:
2. Additional Reference materials (notes, projects, web links, etc.) may be handed out in class, also available in Blackboard.

Software in class: iClicker (Free for UTEP student), Arduino (Online, Free), NI Multisim (Provided by UTEP).

Student’s assessment:
1. Attendance and Quizzes: 30%
   a. Allowed 3 unexcused absences
2. Projects: 30% (Arduino Kit, project video link and word report)
   a. 10% off each day after due date
3. Exams: 40%
   a. Lowest exam grade will be dropped
Students grading

A = ≥ 90%; B = < 90% and ≥ 80%; C = < 80% and ≥ 70%; D = < 70% and ≥ 60%; F = < 60% (UTEP Standard)

Tools in Class/Lab

1. Scientific calculator, Laptop, Pad, e-book, Cell phones (silent mode, no text/call) **Only for iClicker quiz, not on exams.**
2. Arduino Kit (link at the next page)

**Necessary ITEMS**

- **Each student is required to register in iClicker (Attendance and Quiz)**
  - Daily quizzes use iClicker
- **Each student must manage/arrange one set of Arduino Kit**

(Web access: 1/15/23)
<table>
<thead>
<tr>
<th>Date</th>
<th>Class Topic (subject to change)</th>
<th>NOTES &amp; ACTIONS ITEMS</th>
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<tbody>
<tr>
<td>Week 1 1/15</td>
<td>Introduction, Syllabus. High Impact Practices.</td>
<td>Online Class policy, syllabus details Projects, Guideline, etc.</td>
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<td>iClicker setup, Order Arduino kit, Blackboard profile</td>
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<td>Week 2 1/22</td>
<td>Basic concept of Voltage Current, and Power</td>
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<td>Voltage Current, Resistor, Ohms Law, Numerical problems, Hands On</td>
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<td>Week 3 1/29</td>
<td>Voltage Current, Resistor, Ohms Law, Numerical problems, Hands On</td>
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<td>Voltage Current, Resistor, Ohms Law, Numerical problems, Hands On</td>
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<td>Week 4 2/5</td>
<td>Voltage Current, Resistor, Ohms Law, Numerical problems, Hands On</td>
<td>Project-1</td>
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<td>Bring Arduino Kits!</td>
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<td>Week 5 2/12</td>
<td>Capacitor and Capacitance, Numerical Problems with examples</td>
<td>Project-1</td>
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<td>Week 6 2/19</td>
<td>Inductor and Inductance, Numerical Problems</td>
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<td>Week 7 2/26</td>
<td>RC and RL circuits</td>
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<td>Week 10 3/19</td>
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<td>Week 11 3/26</td>
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<td>Week 12</td>
<td>4/2</td>
<td>Transistors (BJT)</td>
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| Week 13 | 4/9 | Magnetism | **Project-3**  
Temperature Reading from thermistor  
**Bring Arduino Kits!** |
| Week 14 | 4/16 | Review | Exam  
Exam-2  
4/19 |
| Week 15 | 4/23 | DC and AC Machines | **Project-3**  
Due 4/24 @ 1:30 pm before class  
**Projects-4**  
Distance measure with Arduino codes  
**Bring Arduino Kits!** |
| Week 16 | 4/30 | Catch up day / Extra Topic /Review | **Project-4**  
Due 5/1 @ 1:30 pm before class  
Catch up day / Extra Topic /Review |
| Week 17 | 5/7 | **Finals week** | **Final Exam**  
Wednesday, 5/10, 4:00 pm – 6:45 pm |
NETIQUETTE
As we know, sometimes communication online can be challenging. It is possible to miscommunicate what we mean or to misunderstand what our classmates mean given the lack of body language and immediate feedback. Therefore, please keep these netiquette (network etiquette) guidelines in mind. Failure to observe them may result in disciplinary action.

- Always consider the audience. This is a college-level course; therefore, all communication should reflect polite consideration of other’s ideas.
- Respect and courtesy must be always provided to classmates and instructor. No harassment or inappropriate postings will be tolerated.
- When reacting to someone else’s message, address the ideas, not the person. Post only what anyone would comfortably state in a face-to-face situation.
- Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space.

Class Attendance
The student is expected to attend all classes and laboratory sessions and attendance is mandatory for all freshman-level courses (1XXX). It is the responsibility of the student to inform each instructor of extended absences. When, in the judgment of the instructor, a student has been absent to such a degree as to impair his or her status relative to credit for the course, the instructor can drop the student from the class with a grade of W before the course drop deadline and with a grade of F after the course drop deadline.

Excused Absences for University-Recognized Activities
Students who will be absent while representing the University in officially recognized University activities (sports, band, professional conferences, etc.) must notify the Dean of Students not less than ten (10) days prior to the absence. The Dean of Students will provide the student with a letter of excuse for the professors. It is the student's responsibility to give the letter to the professors prior to the official recognized activity. Students following these procedures will be permitted to make up both assignments and examinations in consultation with faculty.
EXCUSED ABSENCES AND/OR COURSE DROP POLICY

According to UTEP Curriculum and Classroom Policies, “When, in the judgment of the instructor, a student has been absent to such a degree as to impair his or her status relative to credit for the course, the instructor may drop the student from the class with a grade of “W” before the course drop deadline and with a grade of “F” after the course drop deadline.” See academic regulations in...
the UTEP Undergraduate Catalog for a list of excuse absences. Therefore, if I find that, due to non-performance in the course, you are at risk of failing, I will drop you from the course. I will provide 24-hour advance notice via email.

OR

I will not drop you from the course. However, if you feel unable to complete the course successfully, please tell me and contact the Registrar’s Office to initiate the drop process. If you do not, you are at risk of receiving an “F” for the course.

MAKE-UP WORK

Make-up work will be given only in the case of a documented emergency. Note that make-up work may be in a different format than the original work, may require more intensive preparation, and may be graded with penalty points. If you miss an assignment and the reason is not considered excusable, you will receive a zero. It is therefore important to reach out to me—in advance if possible—and explain with proper documentation why you missed a given course requirement. Once a deadline has been established for make-up work, no further extensions or exceptions will be granted.

ALTERNATIVE MEANS OF SUBMITTING WORK IN CASE OF TECHNICAL ISSUES

I strongly suggest that you submit your work with plenty of time to spare if you have a technical issue with the course website, network, and/or your computer. I also suggest you save all your work (answers to discussion points, quizzes, exams, and essays) in a separate Word document as a back-up. This way, you will have evidence that you completed the work and will not lose credit. If you are experiencing difficulties submitting your work through the course website, please contact the UTEP Help Desk. You can email me your back-up document as a last resort.

INCOMPLETE GRADE POLICY

Incomplete grades may be requested only in exceptional circumstances after you have completed at least half of the course requirements. Talk to me immediately if you believe an incomplete is warranted. If granted, we will establish a contract of work to be completed with deadlines.

ACCOMMODATIONS POLICY

The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the UTEP Center for Accommodations and Support Services (CASS). Contact the Center for Accommodations and Support Services at 915-747-5148, or email them at cass@utep.edu, or apply for accommodations online via the CASS portal.

SCHOLASTIC INTEGRITY

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism
occurs when someone intentionally or knowingly represents the words or ideas of another as one's own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) for possible disciplinary action. To learn more, please visit HOOP: Student Conduct and Discipline.

CLASS RECORDINGS

Recordings will give you access to class lectures, group discussions, and so on if you miss a synchronous or in-person class meeting due to illness or other extenuating circumstance. Our use of such technology is governed by the Federal Educational Rights and Privacy Act (FERPA) and UTEP’s acceptable-use policy. A recording of class sessions will be kept and stored by UTEP, in accordance with FERPA and UTEP policies. Your instructor will not share the recordings of your class activities outside of course participants, which include your fellow students, teaching assistants, or graduate assistants, and any guest faculty or community-based learning partners with whom we may engage during a class session. You may not share recordings outside of this course. Doing so may result in disciplinary action.

TEST PROCTORING SOFTWARE

Two course assessments (the midterm and final exams) will make use of Respondus Lock Down Browser and Respondus Monitor inside of Blackboard to promote academic integrity. You are encouraged to learn more about how to use these programs prior to the first test.

Please review the following guidelines:

- The assessments will only be available at the times identified on the course calendar.
- You may take the test at any time during the 24-hour window.
- A reliable Internet connection is essential to completing the exam. If you must go to a location to take the exam (such as the library), be sure to follow their health and safety requirements.
- You have 2 attempts to take the test. Once the window closes, your answers will be saved, and no changes can be made. The higher score will be recorded.
- Respondus Lockdown Browser will require all internet tabs closed before the test starts.
- Respondus Monitor requires a webcam and microphone.
- You must show the webcam your student ID before the test starts.
- Your face should be completely visible during the test. Blocking the camera will disable the test.
- No notes or textbook materials are permitted during the test. Respondus Monitor requires you to take a video of your surrounding area (desk, chair, walls, etc.)
- You should not have conversations with other people and/or leave and return to the area during the test.

PLAGIARISM DETECTING SOFTWARE

Some of your course work and assessments may be submitted to SafeAssign, a plagiarism detecting software. SafeAssign is used to review assignment submissions for originality and will help you learn how to properly attribute sources rather than paraphrase.

COPYRIGHT STATEMENT FOR COURSE MATERIALS

All materials used in this course are protected by copyright law. The course materials are only for the use of students currently enrolled in this course and only for the purpose of this course. They may not be further disseminated.
COVID-19 PRECAUTIONS

Please stay home if you have been diagnosed with COVID-19 or are experiencing COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, so that we can work on appropriate accommodations. If you have tested positive for COVID-19, you are encouraged to report your results to covidaction@utep.edu, so that the Dean of Students Office can provide you with support and help with communication with your professors. The Student Health Center is equipped to provide COVID 19 testing.

The Center for Disease Control and Prevention recommends that people in areas of substantial or high COVID-19 transmission wear face masks when indoors in groups of people. The best way that Miners can take care of Miners is to get the vaccine. If you still need the vaccine, it is widely available in the El Paso area, and will be available at no charge on campus during the first week of classes. For more information about the current rates, testing, and vaccinations, please visit epstrong.org

Course Resources: Where you can go for assistance

UTEP provides a variety of student services and support:

Technology Resources
- **Help Desk**: Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.

Academic Resources
- **UTEP Library**: Access a wide range of resources including online full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- **University Writing Center (UWC)**: Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- **Math Tutoring Center (MaRCS)**: Ask a tutor for help and explore other available math resources.
- **History Tutoring Center (HTC)**: Receive assistance with writing history papers, get help from a tutor and explore other history resources.
- **RefWorks**: A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.

Individual Resources
- **Military Student Success Center**: Assists personnel in any branch of service to reach their educational goals.
- **Center for Accommodations and Support Services**: Assists students with ADA-related accommodations for coursework, housing, and internships.
- **Counseling and Psychological Services**: Provides various counseling services including individual, couples, and group sessions and career and disability assessments.