

# Metallurgical and Materials Engineering Design and Practice Part 1

## Fall 2020 (online)

MME 4271 – CRN: 18610

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Office Hours: Fridays 9am - 12pm (or by appointment) virtually via MS Teams

### COURSE DESCRIPTION

Metallurgical and Materials Engineering Design and Practice (Parts 1 and 2) integrates concepts from all areas of materials science and metallurgical engineering into a practical senior-level capstone course with a focus on design practice. Students are expected to participate in group project assignments to apply knowledge acquired during their engineering education toward the generation of real-world design solutions. The fundamentals of requirements specification, experimental design, materials selection, materials processing and project execution will serve as the common structure in the development of the design project to be presented for critical peer review at the end of Part 2 of this course series. Successful completion of both design courses will require the students to demonstrate effective communication skills, both oral and written.

Part 1 of this course will involve lectures on modern materials design practice and the application of analytical tools as part of the design process, specifically failure modes and effects analysis (FMEA) and hazards analysis (HA). Case studies on relevant design successes and failures will be presented throughout the semester. During Part 1 of this course, students will be expected to develop a group design project concept and present a critical design review (CDR) before the end of the semester.

### TOPICS TO BE COVERED

- Metallurgical and materials engineering design and problem solving
- Requirements definition
- Design of experiments
- Materials selection process
- Project management overview – cost and scheduling of technical projects
- Engineering project proposal development and review methodologies
- Engineering ethics and the role of Professional Engineers
- Technical Report Writing and Presentation

## **COURSE ASSIGNMENTS AND GRADING**

Part 1 of this course series involves periodic assignments, some of which are applicable to all students in the course, and others which are tailored toward the individual design groups. There will be no exams as part of this course series, and there are only 2 primary deliverables: assignments and the group Critical Design Review document & presentation during finals week at the end of the semester.

- 40% CDR document (due Finals Week)
- 40% CDR presentation (due Finals Week)
- 20% Homework Assignments

### **Grade Distribution:**

100-90 = A    89-80 = B    79-70 = C    69-60 = D    59 and Below = F

## **DEADLINES FOR HOMEWORK AND EXAMS**

All homework assignments must be uploaded to Blackboard by 11:59 PM (mountain) on the due date listed. Late submissions will not be accepted and will be given a grade of zero.

I strongly encourage you to NOT wait until the last minute to submit assignments and exams to avoid delays due to technical issues, and to give yourself time to contact the Help Desk to resolve any issues encountered. I will only accept email submissions or assignments or exam solutions in the case of truly exceptional circumstances.

## **TECHNOLOGY REQUIREMENTS**

Course content is delivered via the Internet through the Blackboard learning management system. Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Google Chrome and Mozilla Firefox are the best browsers for Blackboard; other browsers may cause complications. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

For office hour discussions on MS Teams, you need to have access to a computer/laptop with a webcam and a microphone. You will need to download and/or update the following software: Microsoft Office 365, available free to registered UTEP students. Check that your computer hardware and software are up-to-date and able to access all parts of the course. Click the following link for more information about [Microsoft Office 365](#).

**Important:** If you encounter technical difficulties beyond your scope of troubleshooting, please contact the UTEP [Help Desk](#) as they are trained specifically in assisting with technological needs of students. Please do not contact me for this type of technical assistance.

## **COURSE COMMUNICATION**

Because this is an online class, we won't see each other in the ways you may be accustomed to: during class time, small group meetings, and regular office hours. However, there are a number of ways we can keep the communication channels open:

- **Office Hours:** We will not be able to meet on campus, but I will still have office hours for your questions and comments about the course. My office hours will be held on MS Teams each Friday from 9:00am – 12:00pm (Mountain) or by appointment.
- **Email:** UTEP email is the best way to contact me. I will make every attempt to respond to your e-mail within 24 hours of receipt. When emailing me, be sure to email from your UTEP student account and please include the course title in the subject line. In the body of your email, clearly state your question. At the end of your email, be sure to include your first and last name along with your university identification number.
- **Discussion Boards:** If you have a question that you believe other students may also have, please post it in the Help Board of the discussion boards inside of Blackboard. Please respond to other students' questions if you have a helpful response.
- **Announcements:** Check the Blackboard announcements frequently for any updates, deadlines, or other important messages.

## **NETIQUETTE**

As we have all learned by experience, communication online can sometimes be challenging. It's 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 audience. This is a college-level course; therefore, all communication should reflect polite consideration of other's ideas.
- Respect and courtesy must be provided to classmates and to the instructor at all times. 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.

## **ATTENDANCE AND PARTICIPATION**

Attendance in the course is determined by participation in the learning activities of the course. Your participation in the course is important not only for your learning and success but also to create a community of learners. Participation is determined by completion of the following activities:

- Reading/viewing all course materials to ensure understanding of assignment requirements
- Clear evidence of participation in project group assignments and collaboration
- Participating in the presentation of the CDR during Finals Week.

## **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 excused 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 hours advance notice via email.

Alternatively, if you feel that you are unable to complete the course successfully, please let me know and then 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.

## **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](mailto: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 ones' 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**

The use of recordings will enable you to have access to class lectures. 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.

## **PLAGIARISM DETECTING SOFTWARE**

Some of your course work and assessments may submitted to SafeAssign, a plagiarism detecting software. SafeAssign is used 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

You must STAY AT HOME and REPORT if you:

- (1) have been diagnosed with COVID-19;
- (2) are experiencing COVID-19 symptoms, or;
- (3) have had recent contact with a person who has received a positive coronavirus test.

Reports should be made at [screening.utep.edu](https://screening.utep.edu). If you know of anyone who should report any of these three criteria, you should encourage them to report. If the individual cannot report, you can report on their behalf by sending an email to [COVIDaction@utep.edu](mailto:COVIDaction@utep.edu).

For each day that you attend campus—for any reason—you must complete the questions on the UTEP screening website ([screening.utep.edu](https://screening.utep.edu)) prior to arriving on campus. The website will verify if you are permitted to come to campus. Under no circumstances should anyone come to campus when feeling ill or exhibiting any of the known COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, and alternative instruction will be provided. Students are advised to minimize the number of encounters with others to avoid infection. Wear face coverings when in common areas of campus or when others are present. If you choose not to wear a face covering, you may not come on campus. Students who refuse to wear a face covering and follow preventive COVID-19 guidelines will be subject to disciplinary action according to Section 1.2.3 *Health and Safety* and Section 1.2.2.5 *Disruptions* in the UTEP Handbook of Operating Procedures.

## STUDENT RESOURCES

### 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 a variety of counseling services including individual, couples, and group sessions as well as career and disability assessments.

## WEEKLY CALENDAR (Subject to Change)

	<b>Topic</b>	<b>Lecture</b>	<b>Assignments</b>	<b>Notes</b>
Week 1 8/24-8/28	Course introduction, syllabus, and technology verification	N/A	Make sure you can connect to all course resources in Blackboard	Contact IT Help Desk for assistance as needed
Week 2 8/31-9/4	Introduction to the engineering design process	1	Individual assignment	N/A
Week 3 9/7-9/11	Recognition of need and the definition of requirements	2	Individual assignment	
Week 4 9/14-9/17	Materials selection in the design process	3	Individual assignment	
Week 5 9/21-9/25	Introduction to the design of experiments, HA and FMEA processes	4	Individual assignment	Preliminary Project Teams identified
Week 6 9/28-10/2	Project management overview	5	N/A	Final Project Team membership confirmed
Week 7 10/5-10/9	Engineering project proposal development and review methods	6	Group Assignment	Project Teams identify 3 candidate project ideas
Week 8 10/12-10/16	Engineering ethics and the role of P.E.	7	Group Assignment	Project Teams downselect to final project topic



Week 9 10/19-10/23	Project Teams present topics for initial review and approval	N/A	Group Assignment	Presentations will be held via MS Teams
Week 10 10/26-10/30	Technical report writing and presentation (con't)	N/A	Group Assignment	Presentations will be held via MS Teams
Week 11 11/2 – 11/6	Technical report writing and presentation	8	N/A	N/A
Week 12 11/9-11/13	Project Teams develop CDR package	N/A	Group Assignment	
Week 13 11/16-11/20	Project Teams develop CDR package	N/A	Group Assignment	
Week 14 11/23-11/27	Project Teams develop CDR package	N/A	Group Assignment	
Week 15 11/30-12/4	Project Teams develop CDR package	N/A	Group Assignment	
Finals Week 12/7-12/11	<b>CDR Presentations</b>	N/A	N/A	Presentations to be held via MS Teams