

January 16, 2023

## MECH 5310 Thermodynamics (CRN 24070)

### Course Syllabus

Spring 2023

**COURSE OBJECTIVES:** This course strengthens and expands understanding of thermodynamic concepts and relations, and considers their applications to chemical reactions, chemical and phase equilibrium, and compressible flow.

**TIME:** TR 12:00 pm – 1:20 pm

**LOCATION:** LART 208

**INSTRUCTOR:** Dr. Evgeny Shafirovich

**E-MAIL:** [eshafirovich2@utep.edu](mailto:eshafirovich2@utep.edu)

**OFFICE HOURS:** TR 9:30 am – 11:30 am

**OFFICE:** A112

**TEXTBOOK:** Y.A. Çengel, M.A. Boles, and M. Kanoglu, *Thermodynamics: An Engineering Approach*, 9<sup>th</sup> Edition, McGraw-Hill, 2019, ISBN 978-1-259-82267-4

**BLACKBOARD:** Instructor will be using Blackboard for uploading lectures and other materials, updating the syllabus if necessary, and communicating with students via announcements and email.

**TESTS:** There are five tests with multiple choice questions. They will be conducted in class during regular class hours. There is no final (comprehensive) exam in this course.

**GRADING:** To adjust the results of tests with multiple choice questions to the grade – score system used in the U.S. (and in Blackboard), the score in each test will be determined using the following formula:

$$\text{Score (\%)} = \left( 1 + \frac{\text{Number of obtained points}}{\text{Maximum number of points}} \right) \cdot 50\%$$

The score for the course will be determined as the average of your scores in the five tests.

**COURSE CALENDAR**

<b>Week</b>	<b>Day</b>	<b>Date</b>	<b>Topic</b>	<b>Chapter</b>
1	T	1/17	Course overview. Basic concepts	1, 2
1	R	1/19	Properties of pure substances	3
2	T	1/24	Energy and mass balances	4, 5
2	R	1/26	The second law of thermodynamics	6
3	T	1/31	Entropy	7
3	R	2/2	Entropy	7
4	T	2/7	Exergy	8
4	R	2/9	Exergy	8
5	T	2/14	<b>Test 1</b>	<b>1 - 8</b>
5	R	2/16	<i>Review of Test 1. Thermodynamic property relations</i>	12
6	T	2/21	Thermodynamic property relations	12
6	R	2/23	Thermodynamic property relations	12
7	T	2/28	Thermodynamic property relations	12
7	R	3/2	Thermodynamic property relations	12
8	T	3/7	Gas mixtures	13
8	R	3/9	<b>Test 2</b>	<b>12 and 13</b>
			<i>Spring Break</i>	
9	T	3/21	<i>Review of Test 2. Chemical reactions</i>	15
9	R	3/23	Chemical reactions	15
10	T	3/28	Chemical reactions	15
10	R	3/30	Chemical reactions	15
11	T	4/4	<b>Test 3</b>	<b>15</b>
11	R	4/6	<i>Review of Test 3. Chemical and phase equilibrium</i>	16
12	T	4/11	Chemical and phase equilibrium	16
12	R	4/13	Chemical and phase equilibrium	16
13	T	4/18	<b>Test 4</b>	<b>16</b>
13	R	4/20	<i>Review of Test 4. Compressible flow</i>	17
14	T	4/25	Compressible flow	17
14	R	4/27	Compressible flow	17
15	T	5/2	<b>Test 5</b>	<b>17</b>
15	R	5/4	<i>Review of Test 5 and discussion</i>	

There is no final (comprehensive) exam in this course.

## **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](#).

## **ACCOMODATIONS 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](#).

## **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](mailto: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](http://epstrong.org).