THE AMERICAN UNIVERSITY OF IRAQ
SULAIMANI

Department of Engineering
Undergraduate Program
Fall 2017

Course Information
Course Number & Title: ENGR 352, Thermodynamics, Section 1
Prerequisites/Co-requisite: CSC 101, CHEM 232, and PHYS 232
Class time: S/T/Th, 9:15-10:15 AM, in room A-G-05
Credit: 3 credits, 3 hours

Instructor Information
Instructor: Dr.-Ing. habil. Martin Thomas Horsch
Email: martin.horsch@auis.edu.krd
Office: B-F2-18
Office Hours: M/T, 10:45-11:45 AM

Course Description
ENGR 352 Thermodynamics
Introduction to thermal sciences with an emphasis on the foundations of thermodynamics (first law, second law, thermodynamic properties) and their application to stationary and instationary, reversible and irreversible processes, cycles, properties of pure fluids, gas mixtures, phase equilibria, and chemical reactions.

Learning Outcomes
Upon successfully completing the course, the participants are able to provide a clear description of thermodynamic processes and conditions, employing the appropriate terminology, and to apply conservation laws, the first and second law of thermodynamics, and equations of state to a variety of typical engineering problems, including processes and properties of fluid systems, cycles, and chemical reactions.

Materials
- M. J. Moran, H. N. Shapiro, D. D. Boettner, M. B. Bailey, *Fundamentals of Engineering Thermodynamics*, 7th edn., Wiley, **2011**. (Primary reference for the present course.)
- Y. A. Çengel, M. A. Boles, *Thermodynamics: An Engineering Approach*, 8th edn., McGraw-Hill Education, **2014**.

Evaluation & Grading
Major assessments: There will be two written (mid-)term exams (in class, one hour) and a final exam (two hours). The course mark will be based on the assigned coursework, the active participation (i.e., presentation of results) in a tutorial session, the term exams, and the final exam.

Corresponding percentages:

- Final exam: 50% (Dec. 17, 9:15-11:30 AM, A-G-05)
- Term exams: 30% (two exams, 15% each, Oct. 12 9:00 AM, **Nov. 12 8:00 AM**, A-G-05)
- Assigned work: 15% (six assignments, 2.5% each, **one of which is an unannounced quiz**)
- Tutorial sessions: 5% (for presenting at least once in the tutorial)

The assigned coursework can be completed in groups of two people or as single submissions; this also applies to the discussion of the results in the tutorial. As usual, plagiarism, cheating, and other unacademic practices will not be tolerated.

The general policies of the American University of Iraq, Sulaimani apply as detailed below.

Grading Scale

A	(4.0)	93 - 100	Superior
A-	(3.7)	90 - 92	
B+	(3.3)	87 - 89	Good
B	(3.0)	83 - 86	
B-	(2.7)	80 - 82	
C+	(2.3)	77 - 79	Satisfactory
C	(2.0)	73 - 76	
C-	(1.7)	70 - 72	
D+	(1.3)	67 - 69	Unsatisfactory
D	(1.0)	60 - 66	
F	(0)	Below 60	Fail

Course Policies and Expectations

While You Are in the Class

Students should be alert and willing to participate in class activities and discussions and refrain from having disruptive conversations during class. Students must bring to the class: A copy of the textbook, a notebook for writing course notes, a calculator, all the relevant notes and handouts for the course, the needed stationery, and a copy of the syllabus. Textbooks are protected by copyright laws, and for this reason, the instructor will not allow any student to bring to the class illegal copies of the textbook. If students violate this they will be asked to leave the classroom and marked absent for the lecture.

Students are asked to limit the use of their laptop computers or tablets to class purposes. Those who violate this will not be allowed to bring to the class their laptops and tablets anymore and are not allowed to use their personal laptop computers and tablets during the class lecture. Students must switch off their smart/cell phones during the class lecture, quizzes, and tests. Anyone who does not respect this will be asked to leave the classroom and marked absent for that lecture.

Students are not allowed during the class lecture to study any other material beyond the course subject and will be asked to leave the classroom and marked absent for that lecture. Also, eating in the class is prohibited. All students need to put away newspapers, magazines or any other non-relevant items.

Classroom Conduct

Students are expected to behave in a collegial manner at all times when in class. Rude, disrespectful, aggressive, or threatening language or behavior will not be tolerated, and students displaying this will be removed from class. Attire should be appropriate for university students. Distracting behavior will not be tolerated, and students behaving in this way will be asked to leave the class. Examples of distracting behavior include:

- Side conversations while others are speaking;
- using a cell phone in any way;
- leaving during the middle of class;
- speaking languages other than English;
- eating in class;
- using the computers for any purpose other that course material;
- any other behavior that a student is warned against during class.

Grade Disputes
Unless grades are added up incorrectly, the grades will not change after exams and assignments are handed back to the students. If there is a dispute concerning the final grade for the course, students have the right to make a formal grade appeal within the period set by the Registrar Office. Details on this process can be found in the Academic Catalog.

Incomplete Grades
In the unlikely event that it becomes necessary to assign an "I", for incomplete, as the final grade in the course, the affected student(s) and the instructor will adhere to the incomplete grade policy specified in the Academic Catalog.

Revisions to the Syllabus
This syllabus is subject to change. It is the duty of the instructor to inform students of changes in a timely fashion. Students are obliged to be cognizant of any changes.

Attendance
Every week there are three sessions of the course. The duration of each session is one hour. Students are expected to attend all scheduled classes, arrive on time, and remain in class until dismissed. Delayed arrivals and early departures are disruptive for the students as well as the teacher and are unacceptable. Students who leave the class will be marked absent for the lecture; no excuse will be accepted.

As per university policy, at the eighth absence session the student will be dismissed from the course with a grade of F. These cutoffs are absolute. Per university policy, as stated in the Academic Catalog, there are no excused absences.

Students will be warned after the seventh absence session that they will be dismissed from the course with a grade of F if they are absent one more session. Students may ask, outside the class time, to learn how many classes they missed.

Expectations of Student Time
AUIS adheres to the United States federal definition of a credit hour, as established by the US Department of Education. As a three credit-hour course, you are expected to attend three hours of direct instruction per week, and spend a minimum of six hours out of class per week in homework, studying, preparing, and otherwise engaging with the material of this course.

Academic Integrity
Academic Integrity is honest behavior in a school setting. Academic integrity is more than the absence of cheating. It is necessary for students to truly learn new skills and develop as human beings. By struggling with his/her own studies and by making honest mistakes and discoveries, a student learns about the world and himself/herself. Using another's work inappropriately prevents this intellectual and emotional growth.

Academic Dishonesty ("cheating") is any form of deceit, fraud, or misrepresentation in academic work. Academic dishonesty is the opposite of learning, because it prevents the student-writer from genuinely learning and responding to material. Plagiarism is one of the most serious forms of academic dishonesty.

Plagiarism is using other people's ideas and/or words without clearly acknowledging the source of the information. If a student uses content or grammatical structures from the Internet, a professional writer, or another student and does not inform the reader, he plagiarizes. A student who allows another student to use his writing without attribution is also guilty of plagiarism.

Cheating will not be tolerated in this class. A student found to be cheating for the first time will receive a zero for the assignment and the Dean of Students will be notified. In the event of a second offense confirmed by the Dean of Students, the student will fail the course. A third instance of cheating will result in that student being dismissed from the American University of Iraq, Sulaimani. Students are directed to the AUIS Honor Code and the Academic Integrity policy section of the Academic Catalog (available online at www.auis.edu.krd). These documents provide guidance in cases of academic dishonesty, so we should all be familiar with them.

Time Table

Week	Dates	Topics	Book Sections	Assessment
1	Sep. 10 - 16	Thermodynamic Systems	[MSBB] 1.1 to 1.7 [ÇB] 1-1 to 1-8	
2	Sep. 17 - 23	Work and Heat Transfer, Thermodynamic Properties	[MSBB] 2.1 to 3.8 [ÇB] 2-1 to 3-5	
3	Sep. 24 - 30	Ideal and Real Gases	[MSBB] 3.9 to 3.12 [ÇB] 3-6 and 3-7	
4	Oct. 1 - 7	Closed Systems	[MSBB] 3.13 to 3.15 [ÇB] 4-1 to 4-5	
5	Oct. 8 - 14	Control Volumes	[MSBB] 4.1 to 4.12 [ÇB] 5-1 to 5-5	**Term Exam I on Oct. 12**
6	Oct. 15 - 21	Second Law of Thermodynamics	[MSBB] 5.1 to 5.11 [ÇB] 6-1 to 7-4	
7	Oct. 22 - 28	Entropy Change and Entropy Balance	[MSBB] 6.1 to 6.11 [ÇB] 7-5 to 7-9, 7-13	
8	Oct. 29 - Nov. 4	Equations of State	[MSBB] 3.2, 3.11, 11.1 [ÇB] 3-8	
9	Nov. 5 - 11	Thermodynamic Property Relations, Phase Equilibria	[MSBB] 11.2 to 12.4 [ÇB] 12-1 to 13-3	
10	Nov. 12 - 18	Phase Transitions	[MSBB] 3.3, 4.9, 14.5 [ÇB] 16-6	**Term Exam II on Nov. 12**
11	Nov. 19 - 25	Vapor Power Cycles	[MSBB] 8.1 and 8.2 [ÇB] 10-1 and 10-2	
12	Nov. 26 - Dec. 2	Review, Problem Solving		
13	Dec. 3 - 9	Chemical Reaction Thermodynamics	[MSBB] 13.1 to 14.3 [ÇB] 15-1 to 16-5	
14	Dec. 10 - 16	Review, Problem Solving		
15	Dec. 17 - 23	**Final Exam**		

[MSBB] Moran, Shapiro, Boettner, Bailey, *Fundamentals of Engineering Thermodynamics;*
[ÇB] Çengel, Boles, *Thermodynamics: An Engineering Approach*.