

MECH 3312 Thermodynamics Spring 2016

Course Motivation	Continuation of learning the basic principles of thermodynamics started in “Introduction to Thermal-Fluid Sciences.” Application of these basic principles to engineering problems for systems involving power and refrigeration cycles.
Prerequisite	MECH 2311 Intro to Thermal-Fluid Sciences with a grade of “C” or better
Time and place	TR 7:30 am – 8:50 am, UGLC 346
Instructor	Evgeny Shafirovich, PhD Associate Professor Department of Mechanical Engineering <i>E-mail:</i> eshafirovich2@utep.edu <i>Office hours:</i> MTWR 9:00 am – 10:30 am <i>Office location:</i> Engineering Bldg., A-112 <i>Office phone:</i> 747-6465
Textbook	<i>Thermodynamics An Interactive Approach</i> by Subrata Bhattacharjee Pearson, 2015

This book is used for the following courses:

- MECH 2311 Introduction to Thermal-Fluid Sciences
- MECH 3312 Thermodynamics

MasteringEngineering is a service provided by the book publisher, Pearson. You are required to get access to MasteringEngineering for this course.

Here is the bookstore information:

Bundle: Thermodynamics: An Interactive Approach Plus
MasteringEngineering with Pearson eText--Access Card Package
ISBN-10: 0133807975
ISBN-13: 978-0133807974
Format: Paper Bound Book Package; 880 pages
Price: \$183.35

All-Digital: MasteringEngineering with Pearson eText-- Standalone
Access Card-- for Thermodynamics: An Interactive Approach
ISBN-10: 0133810844
ISBN-13: 978-0133810844
Format: Access Card Package
Price: \$101.25

Mastering Engineering

Course ID: MESHAFIROVICH77937. Please see the Registration Handout at the end of this syllabus or as a standalone document on Blackboard.

Links to short videos about MasteringEngineering:

Getting Started: <https://www.youtube.com/watch?v=qZGkellE3Y>

Registration: <https://www.youtube.com/watch?v=c9PWBDQRqfH4>

A more detailed video that will walk you through the MasteringEngineering registration process and will also provide some helpful tips:

<https://youtu.be/kUUrUtb5Gqc>

In case of Pearson technical issues:

Do NOT email the instructor.

Follow the Student Technical Support Protocol:

Step 1: Review the Student Support FAQ page here:

<http://www.pearsonmylabandmastering.com/northamerica/students/support/index.html>

Step 2: If you cannot find your question in the FAQ, visit the site to contact Technical Support:

<http://247pearsoned.custhelp.com/app/contact>

Step 3: If Tech Support does not resolve your issue, you may contact our dedicated Pearson rep:

Ms. Shauntel Campos: Shauntel.campos@pearson.com

You MUST provide your Technical Support Ticket number in this email.

Course Content

- Mass, energy, and entropy analysis of unsteady systems
- Exergy balance equation
- Reciprocating engine power cycles
- Gas turbine power cycles
- Vapor power cycles
- Refrigeration cycles

Course Objectives

Upon completion of this course, students should be able to:

- Conduct mass, energy, and entropy analysis of unsteady systems.
- Understand the concept of exergy, conduct exergy analysis of systems and cycles.
- Analyze ideal gas power cycles: write energy and entropy balances, determine heat and work, and calculate the cycle efficiency.
- Analyze steam power cycles: write energy and entropy balances, determine heat and work, and calculate the cycle efficiency.
- Analyze vapor compression refrigeration cycles: write energy and entropy balances, determine heat and work, and calculate the cycle coefficient of performance.

Homework	<p>MasterEngineering will calculate your grade according to the following.</p> <p>Number of answer attempts per question: 6</p> <p>You gain credit for: Correctly answering a question in a Part, Correctly answering a question in a Hint, Not opening a Hint (2% bonus)</p> <p>Hints are helpful clues or simpler questions that guide you to the answer. Hints are not available for all questions. There is no penalty for leaving questions in Hints unanswered.</p> <p>You lose credit for: Exhausting all attempts or giving up on a question in a Part or Hint Incorrectly answering a question in a Part or Hint</p> <p>Late submissions: receive no credit.</p>												
Quizzes	<p>There will be a quiz for each of the six studied chapters of the textbook (Chs. 5 – 10). The quizzes will be conducted using LearningCatalytics. The access to MasteringEngineering includes free access to Learning Catalytics. No makeups for the missed quizzes.</p>												
Exams	<p>There will be three midterm exams and a final comprehensive exam. All exams are open book and open notes. No makeups for the missed exams.</p>												
Grading	<table border="0"> <tr> <td>Homework</td> <td>10%</td> </tr> <tr> <td>Quizzes</td> <td>25%</td> </tr> <tr> <td>Exam 1</td> <td>15%</td> </tr> <tr> <td>Exam 2</td> <td>15%</td> </tr> <tr> <td>Exam 3</td> <td>15%</td> </tr> <tr> <td>Final Exam</td> <td>20%</td> </tr> </table>	Homework	10%	Quizzes	25%	Exam 1	15%	Exam 2	15%	Exam 3	15%	Final Exam	20%
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ABET Program Outcomes Impacted	<p>This class addresses the following ABET objectives:</p> <ul style="list-style-type: none"> (a) An ability to apply knowledge of mathematics, science, and engineering (e) An ability to identify, formulate, and solve engineering problems (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice 												
Scholastic Dishonesty	<p>All graded materials must represent the student's individual work. Scholastic dishonesty is the attempt of any student to present as his or her own work of another, or any work which he/she has not honestly performed, or attempting to pass any examination by improper means. <i>Scholastic dishonesty is a serious offense and will not be tolerated.</i> Suspected scholastic dishonesty will be handled according to the university policy.</p>												
Reasonable Accommodation Policy	<p>If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass.</p>												

COURSE CALENDAR

May be updated throughout the semester. Always see the current version of the syllabus on Blackboard.

Week	Day	Date	Topic	Sections
1	T	1/19	Introduction to the course	
	R	1/21	Mass, energy, and entropy analysis of unsteady systems	5.1
2	T	1/26	Mass, energy, and entropy analysis of unsteady systems	5.1
	R	1/28	Mass, energy, and entropy analysis of unsteady systems	5.1
3	T	2/2	Mass, energy, and entropy analysis of unsteady systems	5.2 – 5.5
	R	2/4	Exergy balance equation	6.1
4	T	2/9	Exergy balance equation	6.2
	R	2/11	Exergy balance equation	6.4
5	T	2/16	Exergy balance equation	6.3, 6.5
	R	2/18	Review	
6	T	2/23	Exam 1	Chs. 5-6
	R	2/25	Reciprocating engine power cycles	7.1 – 7.3
7	T	3/1	Reciprocating engine power cycles	7.4
	R	3/3	Reciprocating engine power cycles	7.5
		3/7– 3/11	<i>Spring Break</i>	
8	T	3/15	Reciprocating engine power cycles	7.6 – 7.10
	R	3/17	Gas turbine power cycles	8.1, 8.2
9	T	3/22	Gas turbine power cycles	8.3 – 8.6
	R	3/24	Gas turbine power cycles	8.7 – 8.8
10	T	3/29	Review	
	R	3/31	Exam 2	Chs. 7-8
11	T	4/5	Vapor power cycles	9.1, 9.2
	R	4/7	Vapor power cycles	9.2
12	T	4/12	Vapor power cycles	9.3
	R	4/14	Vapor power cycles	9.4 – 9.6
13	T	4/19	Refrigeration cycles	10.1 – 10.3
	R	4/21	Refrigeration cycles	10.3
14	T	4/26	Refrigeration cycles	10.4, 10.5
	R	4/28	Refrigeration cycles	10.5, 10.6
15	T	5/3	Review	
	R	5/5	Exam 3	Chs. 9-10
16	R	5/12	Final Exam, 7:00 – 9:45 am	Chs. 5-10

Get Started with Pearson's MasteringEngineering

First, make sure you have these 3 things...

Email: You'll get some important emails from your instructor at this address.

Course ID: MECH 3312 Thermodynamics (Spring 2016)

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Access code or credit card: The required access code comes either with your book or by itself at your bookstore. Alternatively, you can buy instant access with a credit card or PayPal account during registration.

Next, get registered!

1. Go to www.masteringengineering.com.
2. Under the large **Register** section on the right side of the page, and click the **Student** button.
3. Read the onscreen instructions and click **OK! Register now**.
4. Next, check off whether or not you have an **Access Code**. If you don't, select your textbook.
5. After this, either **Create** a new Pearson username/password, or, if you've already registered for another Pearson product (i.e. MyMathLab), enter that username/password. If you have an **Access Code**, enter it on the bottom of the page.
6. On the next page, fill out the appropriate information fields then click **Next**. If you entered an **Access Code**, you will be brought to a page from which you can access your product. If not, enter your payment information so that you can **Purchase Access**, after which you'll be granted access.
7. You are now registered! Now, it's time to sign. Go to www.masteringengineering.com and click the **Sign In** button in the top right. Enter your username and password.

Need help?

Visit www.masteringengineering.com for:

- Helpful videos
- Frequently Asked Questions
- System Requirements
- Other helpful "getting started" info!

Or visit our 24/7 Technical Support site at <http://247pearsoned.custhelp.com>