College of Engineering  
Course Title: Thermodynamics I  
Spring 2020

<table>
<thead>
<tr>
<th>Course Prefix: CHEG</th>
<th>Course No.: 2043</th>
<th>Section No.: P01 &amp; P81</th>
<th>Department of Chemical Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor Name:</td>
<td>Keisha Antoine, PhD, PE</td>
<td>Prairie View A&amp;M University</td>
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<tr>
<td>Office Location:</td>
<td>C.L. Wilson 201E</td>
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<td>Office Phone:</td>
<td>936-261-9407</td>
<td>Mail Stop 2505</td>
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<td>Fax:</td>
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<td>Prairie View, TX 77446-0519</td>
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<td>Email Address:</td>
<td><a href="mailto:keantoine@pvamu.edu">keantoine@pvamu.edu</a></td>
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Office Hours: MW 12:30-1:50 PM & 4:00-5:00 PM; F 12:30-2:30 PM 
Virtual Office Hours: By Appointment
Course Location: New Electrical Engineering Bldg 115, NEEB 117 (Recitation) 
Class Meeting Days & Times: MW 2:00-3:20 PM; M 5:30-6:20 PM (Recitation)

Catalog Description

Pre-requisites: CHEM 1034 (or CHEM 1043), PHYS 2513 and CHEG 2053. Calculus is an implied prerequisite.
Co-requisites: NA

Required Text

Recommended Text/Readings

Access to Learning Resources
PVAMU Library
phone: (936) 261-1500
web: http://www.tamu.edu/pvamu/library/

University Bookstore
phone: (936) 261-1990
web: https://www.bkstr.com/Home/10001-10734-1?demoKey=d

Goals
The goal of the course is to introduce to the students the concept of energy and entropy. The first and second law of thermodynamics with applications to real processes and cycles are emphasized. Carnot theorem is derived and efficiency concept illustrated. Equations of state of pure substances such as van der Waals, general cubic, and Virial are discussed in detail. The applications of efficiency and laws of thermodynamics to turbines, pumps, refrigerators, automobiles and combined cycle power plants are discussed in detail.

Outcomes
The student will have demonstrated the ability to:
1. Apply knowledge of mathematics, science and engineering
2. Identify, formulate and solve engineering problems
3. Be able to use the skills, techniques, and modern engineering tools for engineering practice
Course Requirements & Evaluation Methods
Students will be evaluated based on their performance on class examinations, homework, projects, quizzes and the final exam. The internal department criterion D1 – An ability to identify, formulate, and solve fundamental engineering problems by applying principles of engineering, science, and mathematics – will be measured for this course.

Grading Policy

<table>
<thead>
<tr>
<th>Item (Averages)</th>
<th>Weight %</th>
<th>Grade</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance</td>
<td>10</td>
<td>A</td>
<td>100-90</td>
</tr>
<tr>
<td>In-class Quizzes</td>
<td>20</td>
<td>B</td>
<td>89-80</td>
</tr>
<tr>
<td>Homework/Project</td>
<td>5</td>
<td>C</td>
<td>79-70</td>
</tr>
<tr>
<td>Tests/Exams</td>
<td>40</td>
<td>D</td>
<td>69-60</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25</td>
<td>F</td>
<td>59 or below</td>
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Course Procedures
At the lecturer’s discretion, additional (optional) assignments/tests may be given for extra credit.

Homework Policy
- Homework problems will be solely for practice to get students ready for the class quizzes and tests.
- Practice problems have been provided for students on the tentative lecture schedule. These problems are for your independent practice and not for weekly submission.
- Specific homework assignments will be given throughout the semester as the instructor examines the specific need of the class.
- These assignments may be computer based or involve the textbook.
- For assignments that are to be graded, students must submit these assignments during a given time frame.
- If a student chooses to disobey the university’s honor code and copy the solution manual instead of submitting the student’s own independent work, the student will receive a grade of zero on the assignment and will be referred to the department head. Such meetings must take place within a week of the infraction.

Exam Policy
- Exams are open book unless otherwise stated.
- Exams should be taken as scheduled. No makeup examinations will be allowed except under documented emergencies (See Student Handbook).
- Only the required and recommended supplemental texts may be used on open book exams.
- No electronic device with internet or network connectivity will be allowed (e.g., smartphones, iPads, eReaders, Tablets, etc.)
- No graphing calculators are allowed for any test or quiz. Students must purchase a small scientific calculator to use on exams. A cell phone cannot be use as a replacement for a graphing calculator on an exam.
- Students should dress professionally and are NOT allowed to wear caps/hats in class.
- Students are NOT allowed to bring food to the classroom or eat in class.
- Any sightings of a cellular phone during an exam or a quiz will automatically result in a grade of zero for that student, and the student will be referred to the department head. Such meetings must take place within a week of the violation.

Class Activities and Participation Grades
- This class has a recitation (Thermo Lab) component. Class activities will often occur during the recitation.
- No late or replacement assignments will be accepted.
- These activities may be computer based or involve the textbook.
- Students must submit these assignments during a given time frame.

Quiz Information
- Closed-book quizzes will be given throughout the semester. Quizzes will be based on material covered in class and homework assignments.
- A quiz can be given in class or online using Taskstream or eCourses.

Final Exam Procedures
• The comprehensive final exam will be open book.
• All students are required to take the final exam. No exemptions are given.
• It is the student’s responsibility to arrive on time for the exam with all of the needed materials.

Expectations
Class attendance is required at Prairie View. Additionally, I have seen that there is a direct correlation between class attendance and student success. As such, your on-time attendance is expected. Attendance also counts for 10% of your grade. You are expected to remain in class until the class has ended. As a matter of courtesy, please notify me of any anticipated absences at least one day before (barring family emergencies or illnesses). Please turn off your cell phones before class. Cell phone use during class is not tolerated.
<table>
<thead>
<tr>
<th>Week</th>
<th>Chapter</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1: Introduction</td>
<td>Dimensions and Units, Measures of amount or Size, Force, Temperature, Pressure, Work, Energy, Heat</td>
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<td><strong>Exam 1 – Jan/Feb</strong></td>
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<tr>
<td>5</td>
<td>3: Volumetric Properties of Pure Fluids</td>
<td>Cubic Equations of State, Generalized Correlations for Gases, Generalized Correlations for Liquids</td>
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<tr>
<td>7</td>
<td>4: Heat Effects</td>
<td>Standard Heat of Combustion, Temperature Dependence of $\Delta H^\circ$, Heat Effects of Industrial Reactions</td>
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<td><strong>Exam 2 – Feb</strong></td>
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<tr>
<td>10</td>
<td>6: Thermodynamic Properties of Fluids</td>
<td>Property Relations for Homogeneous Phases, Residual Properties, Residual Properties by Equations of State, Two-Phase Systems</td>
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<tr>
<td>11</td>
<td>6: Thermodynamic Properties of Fluids</td>
<td>Thermodynamic Diagrams, Tables of Thermodynamic Properties, Generalized Property Correlations for Gases</td>
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<td><strong>Exam 3 – Mar</strong></td>
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<td>12</td>
<td>7: Applications of Thermodynamics to Flow Processes</td>
<td>Duct Flow of Compressible Fluids, Turbines, Compression Processes</td>
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<tr>
<td>13</td>
<td>8: Production of Power From Heat</td>
<td>The Steam Power Plant, Internal-Combustion Engines, Jet Engines, Rocket Engines</td>
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<td>14</td>
<td>9: Refrigeration and Liquefaction</td>
<td>The Carnot Refrigerator, The Vapor-Compression Cycle, The Heat Pump,</td>
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<tr>
<td>15</td>
<td>Review &amp; Final Exam</td>
<td><strong>Mark your calendar!</strong></td>
</tr>
</tbody>
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University Rules and Procedures

Disability statement (See Student Handbook):
Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

Academic misconduct (See Student Handbook):
You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

Forms of academic dishonesty:
1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.
2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.
3. Fabrication: use of invented information or falsified research.
4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else’s words, ideas, or data as one’s own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one’s own work also constitutes plagiarism.

Nonacademic misconduct (See Student Handbook)
The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor’s ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

Sexual misconduct (See Student Handbook):
Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

Attendance Policy:
Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades. Excessive absenteeism, whether excused or unexcused, may result in a student’s course grade being reduced or in assignment of a grade of “F”. Absences are accumulated beginning with the first day of class.

Student Academic Appeals Process
Authority and responsibility for assigning grades to students, rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.