

ROY G. PERRY COLLEGE OF ENGINEERING
MECHANICAL ENGINEERING DEPARTMENT
PRAIRIE VIEW A&M UNIVERSITY

ASSESSMENT REPORT COVER PAGE

MCEG 3302 THERMODYNAMICS II

SPRING 2022 SEMESTER

NAME OF INSTRUCTOR: Dr. Ziaul Huque

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 - 5.2 An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors (outcome 2).

Detailed Course Syllabus
(Distributed to Students at the beginning of the Semester)

MCEG 3302-Y02 : Thermodynamics II Spring 2022

Instructor: Dr. Ziaul Huque
Section # and CRN: Y02 and 20222
Office Location: Wilson Bldg., Room 105E
Office Phone: 936-261-9957
Email Address: zihuque@pvamu.edu
Office Hours: 2:00 – 3:30 pm; Mondays and Wednesdays
Mode of Instruction: Hybrid

Course Location: New Electrical Engineering Bldg; Room 137
Class Days & Times: 1:00 pm – 1:50 pm; MWF
Catalog Description: MCEG 3302. Thermodynamics II. (3-0) Credit 3 semester hours. Continuation of Thermodynamics I, including various power cycles, refrigeration cycles, fluid flow, combustion process, and advanced concepts of gas dynamic such as shock waves

Prerequisites: MCEG 2301 (MCEG 2013) and MATH 2414 (MCEG 2024).
Co-requisites:

Required Text(s): Thermodynamics, An Engineering Approach, Yunus A. Çengel, and Michael A. Boles, 9th Edition, McGraw-Hill, Higher Education, 2008.

Recommended Text(s):

1. Funds of Engineering Thermodynamics, by Michael Moran, 5th Edition, Wiley & Sons, 2004.
2. Fundamentals of Thermodynamics, Richard Sonntag, Claus Borgnakke, and Gordon J. Van Wylen, 6th Edition, John Wiley & Sons, 2003.
3. Thermodynamics, Edward E. Anderson, PWS Publishing Company, 1994.
4. Thermodynamics, Concepts and Applications by Stephen R. Turns, Cambridge University Press, New York, 2006.
5. Engineering Thermodynamics, by Dwight C. Look, Jr., PWS Publishing, Boston, 1986.

Student Learning Outcomes:

	Upon successful completion of this course, students will be able to:	Program Learning Outcome # Alignment	Core Curriculum Outcome Alignment
1	Solve the energy and exergy balance problems.	1	1, 2
2	Identify, formulate, solve intermediate, advanced and complex thermodynamic engineering problems.	1, 3	1, 2

Program Educational Objectives

The goal of the Mechanical Engineering Program is to produce industrial, scientific, and technological leaders capable of systematically identifying, addressing, and solving technical problems whose solutions will benefit society. Specific educational objectives of the Mechanical Engineering Program are to produce graduates who will:

1. have successful careers in engineering and related fields;
2. advance their careers through increasing levels of responsibilities and leadership;
3. successfully pursue graduate or advanced professional degrees and continuing professional development; and
4. actively participate in professional and community services.

ABET Outcomes

Students who enroll in the Mechanical Engineering program are provided with the skill set to make them successful industrial, scientific, and technological leaders by ensuring that by the time of graduation with the BSME degree, they have:

1. an ability to identify, formulate, and solve complex engineering problems by applying principals of engineering, science, and mathematics.
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions on an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Major Course Requirements

Method of Determining Final Course Grade

Course Grade Requirement	Value	Total
1. Homework Assignments/Quizzes	50	50
2. Exam #1	200	200
3. Exam #2	200	200
4. Exam #3	200	200
5. Design Project	50	50
6. Final Exam	300	300
Total:		1000

Grading Criteria and Conversion:

A = 1000 – 900pts;
B = 899 – 800pts;
C = 799 – 700pts;
D = 699 – 600pts;
F = 599pts or below

Course Procedures or Additional Instructor Policies

Taskstream

Taskstream is a tool that Prairie View A&M University uses for assessment purposes. One of your assignments may be required to be submitted as an "artifact," an item of coursework that serves as evidence that course objectives are met. If applicable, more information will be provided during the semester, but for general information, you can visit Taskstream via the link in eCourses.

Course Policy

Note: The instructor reserves the right to alter it during the semester.

Academic Integrity

Academic dishonesty of any sort (plagiarism, cheating, fabrication or facilitation) is prohibited under any circumstance. Any detected actions of dishonesty will cause the failure of the class directly.

Assignments & Due Dates

Homework should be submitted on or before the due date and time. Late homework will be charged a 10% penalty for each day late – weekend days do count. Circumstances beyond your control (i.e. illness, computer failure, weather, etc.) will be considered as required.

Projects

You need to submit the project electronically on or before the due date. No late submission of the project will be accepted.

Examinations

No makeup test will be given. You will be expected to complete the exam in the allotted time period. Portions of each exam may be either closed or open book. You will be notified of the exam format at least one week in advance.

Semester Calendar

Week One: Topic Description Readings: Assignment (s):	Course Overview A Quick Review of Thermodynamics I Exergy: Work Potential of Energy Chapter 8 Assigned in Canvas
Week Two: Topic Description Readings: Assignment (s):	Exergy: Work Potential of Energy - Reversible Work and Irreversibility - Second-Law Efficiency - Exergy Change of a System - Exergy Transfer Chapter 8 Assigned in Canvas
Week Three: Topic Description Readings: Assignment (s):	Exergy: Work Potential of Energy - Exergy Destruction - Exergy Balance: Closed Systems - Exergy Balance: Control Volumes Chapter 8 Assigned in Canvas
Week Four: Topic Description Readings: Assignment (s):	Gas Power Cycles - Basic Considerations / Carnot Cycle / Air Standard Assumptions - Otto Cycle - Diesel Cycle - Stirling and Ericsson Cycles Chapter 9 Assigned in Canvas
Week Five: Topic Description Readings: Assignment (s):	Gas Power Cycles; Exam #1 - Brayton Cycle - Second-Law Analysis of Gas Power Cycles Chapter 9 Assigned in Canvas
Week Six: Topic Description Readings: Assignment (s):	Vapor and Combined Power Cycles - Rankine Cycle Chapters 10 Assigned in Canvas
Week Seven: Topic Description Readings: Assignment (s):	Vapor and Combined Power Cycles - Efficiency Enhancement of Rankine Cycles - Regenerative Rankine Cycle Chapters 10 Assigned in Canvas
Week Eight: Topic Description Readings: Assignment (s):	Vapor and Combined Power Cycles; Exam #2 - Second-Law Analysis of Vapor Power Cycles - Combined Cycle Chapter 10 & 11 Assigned in Canvas

Week Nine:

SPRING BREAK

Week Ten:

Topic Description

Readings:

Assignment (s):

Refrigeration Cycles

- Vapor Compression Refrigeration Cycle
- Second-Law Analysis of Vapor-Compression Refrigeration Cycle
- Heat Pump Systems

Gas Mixtures

- Composition of a Gas Mixture

Chapters 11 & 13

Assigned in Canvas

Week Eleven:

Topic Description

Readings:

Assignment (s):

Gas Mixtures

- Properties of Gas Mixtures

Chapter 13

Assigned in Canvas

Week Twelve:

Topic Description

Readings:

Assignment (s):

Gas-Vapor Mixtures & Air-Conditioning

- Dry and Atmospheric Air
- Properties of Moist Air
- Air Conditioning Processes

Chapter 14

Assigned in Canvas

Week Thirteen:

Topic Description

Readings:

Assignment (s):

Gas-Vapor Mixtures & Air-Conditioning

- Air Conditioning Processes

Chemical Reactions

- Fuels and Combustion
- Theoretical and Actual Combustion Processes

Chapters 14 & 15

Assigned in Canvas

Week Fourteen:

Topic Description

Readings:

Assignment (s):

Chemical Reactions; Exam #3

- Enthalpy of Formation and Enthalpy of Combustion
- First-Law Analysis of Reacting Systems

Chapters 15

Assigned in Canvas

Week Fifteen:

Topic Description

Readings:

Assignment (s):

Chemical Reactions;

- First-Law Analysis of Reacting Systems

Chapter 15

Week Sixteen:

FINAL EXAM

Student Support and Success

John B. Coleman Library

The John B. Coleman Library's mission is to enhance the scholarly pursuit of knowledge, to foster intellectual curiosity, and to promote life-long learning and research through our innovative services, resources, and cultural programs, which support the Prairie View A&M University's global mission of teaching, service, and research. It maintains library collections and access both on campus, online, and through local agreements to further the educational goals of students and faculty. Website: <https://www.pvamu.edu/library/>; Phone: 936-261-1500

Academic Advising Services

Academic Advising Services offers students a variety of services that contributes to student success and leads towards graduation. We assist students with understanding university policies and procedures that affect academic progress. We support the early alert program to help students get connected to success early in the semester. We help refer students to the appropriate academic support services when they are unsure of the best resource for their needs. Faculty advisors support some students in their respective colleges. Your faculty advisor can be identified in PantherTracks. Advisors with Academic Advising Services are available to all students. We are located across campus. Find your advisor's location by academic major at www.pvamu.edu/advising. Phone: 936-261-5911

The University Tutoring Center

The University Tutoring Center (UTC) offers free tutoring and academic support to all registered PVAMU students. The mission of the UTC is to help provide a solid academic foundation that enables students to become confident, capable, independent learners. Competent and caring staff and peer tutors guide students in identifying, acquiring, and enhancing the knowledge, skills, and attitudes needed to reach their desired goals. Tutoring and academic support are offered face-to-face in the UTC, in virtual face-to-face sessions (<https://www.pvamu.edu/student-success/sass/university-tutoring-center/>), and through online sessions (<https://www.pvamu.edu/pvplace/>). Other support services available for students include Supplemental Instruction, Study Break, Academic Success Workshops, and Algebra Study Jam. Location: J. B. Coleman Library, Rm. 307; Phone: 936-261-1561; Email: pvtutoring@pvamu.edu; Website: <https://www.pvamu.edu/student-success/sass/university-tutoring-center/>

Writing Center

The Writing Center provides well-trained peer tutors to assist students with writing assignments at any stage of the writing process. Tutors help students with various writing tasks from understanding assignments, brainstorming, drafting, revising, editing, researching, and integrating sources. Students have free access to Grammarly online writing assistance. Grammarly is an automated proofreading and plagiarism detection tool. Students must register for Grammarly by using their student email address. In addition, students have access to face-to-face and virtual tutoring services either asynchronously via email or synchronously via Zoom. Location: J. B. Coleman Library, Rm. 209; Phone: 936-261-3724; Website: <https://www.pvamu.edu/student-success/writing-center/>; Grammarly Registration: <https://www.grammarly.com/enterprise/signup>

Academic Early Alert

Academic Early Alert is a proactive system of communication and collaboration between faculty, academic advisors, and PVAMU students that is designed to support student success by promptly identifying issues and allowing for intervention. Academic Early Alerts help students by providing a central location to schedule advising appointments, view advisor contact information, and request assistance. Students who recognize that they have a problem that is negatively affecting their academic performance or ability to continue school may self-refer an Academic Early Alert. To do so, students will log in to PV Place and click on Academic Early Alert on the left sidebar. Phone: 936-261-5902; Website: <https://www.pvamu.edu/student-success/early-alert/>

Student Counseling Services

The Student Counseling Services unit offers a range of services and programs to assist students in maximizing their potential for success: short-term individual, couples, and group counseling, as well as crisis intervention, outreach, consultation, and referral services. The staff is licensed by the State of Texas

and assists students who are dealing with academic skills concerns, situational crises, adjustment problems, and emotional difficulties. Information shared with the staff is treated confidentially and in accordance with Texas State Law. Location: Hobart Taylor, 2nd floor; Phone: 936-261-3564; Website: <https://www.pvamu.edu/healthservices/student-counseling-services/>

Office of Testing Services

Testing Services serves to create opportunities by offering a suite of exams that aid in the students' academic and professional success. Currently, we administer entrance (HESI A2), college readiness (TSI assessment), Prior Learning (CLEP, DSST), and proctored exams. Location: Wilhelmina Delco, 3rd Floor, Rm. 305; Phone: 936-261-3627; Email: aetesting@pvamu.edu; Website: www.pvamu.edu/testing

Office of Diagnostic Testing and Disability Services

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, contact the Office of Disability Services. As a federally-mandated educational support unit, the Office of Disability Services serves as the repository for confidential disability files for faculty, staff, and students. For persons with a disability, the Office develops individualized ADA letters of request for accommodations. Other services include learning style inventories, awareness workshops, accessibility pathways, webinars, computer laboratory with adapted hard and software, adapted furniture, proctoring non-standardized test administrations, ASL interpreters, ALDs, digital recorders, Livescribe, and a comprehensive referral network across campus and the broader community. Location: Hobart Taylor, Rm. 1D128; Phone: 936-261-3583; Website: <https://www.pvamu.edu/disabilityservices/>

Center for Instructional Innovation and Technology Services (CIITS)

Distance Learning, also referred to as Distance Education, is the employment of alternative instructional delivery methods to extend programs and services to persons unable to attend college in the traditional manner. The Center for Instructional Innovation and Technology Services (CIITS) supports student learning through online, hybrid, web-assist, and 2-way video course delivery. For more details and contact information, visit:

<https://www.pvamu.edu/dlearning/distance-learning-2-2/students-2/>; Phone: 936-261-3283

Veteran Affairs

Veterans Services works with student veterans, current military and military dependents to support their transition to the college environment and continued persistence to graduation. The Office coordinates and certifies benefits for both the G.I. Bill and the Texas Hazlewood Act. Location: Evans Hall, Rm. 102; Phone: 936-261-3563; Website: <https://www.pvamu.edu/sa/departments/veteranaffairs/>

Office for Student Engagement

The Office for Student Engagement delivers comprehensive programs and services designed to meet the co-curricular needs of students. The Office implements inclusive and accessible programs and services that enhance student development through exposure to and participation in diverse and relevant social, cultural, intellectual, recreational, community service, leadership development, and campus governance. Location: Memorial Student Center, Rm. 221; Phone: 936-261-1340; Website: <https://www.pvamu.edu/studentengagement/>

Career Services

Career Services supports students through professional development, career readiness, and placement and employment assistance. The Office provides one-on-one career coaching, interview preparation, resume and letter writing, and career exploration workshops and seminars. Services are provided for students at the Northwest Houston Center and College of Nursing in the Medical Center twice a month or on a requested basis. Distance Learning students are encouraged to visit the Career Services website for information regarding services provided. Location: Anderson Hall, 2nd floor; Phone: 936-261-3570; Website: <https://www.pvamu.edu/careerservices/>

University Rules and Procedures

Academic Misconduct

Academic dishonesty is defined as any form of cheating or dishonesty that has the effect or intent of interfering with any academic exercise or fair evaluation of a student's performance. The college faculty can provide additional information, particularly related to a specific course, laboratory, or assignment.

You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with the *University Administrative Guidelines on Academic Integrity*, which can be found on the [Academic Integrity webpage](#). Students who engage in academic misconduct are subject to university disciplinary procedures. As listed in the *University Administrative Guidelines on Academic Integrity*, the University Online Catalog, and the Student Code of Conduct, the following are examples of prohibited conduct. This list is not designed to be all-inclusive or exhaustive. In addition to academic sanctions, any student found to have committed academic misconduct that is also a violation of criminal law may also be subject to disciplinary review and action by the Office of Student Conduct (as outlined in the Student Code of Conduct).

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 learned, giving or receiving aid unauthorized by the instructor on assignments or examinations. Examples: unauthorized use of notes for a test; using a "cheat sheet" on a quiz or exam; any alteration made on a graded test or exam which is then resubmitted to the teacher;
2. Plagiarism: Careless or deliberate use of the work or the ideas of another; representation of another's work, words, ideas, or data as your own without permission or appropriate acknowledgment. Examples: copying another's paper or answers, failure to identify information or essays from the internet and submitting or representing it as your own; submitting an assignment which has been partially or wholly done by another and claiming it as yours; not properly acknowledging a source which has been summarized or paraphrased in your work; failure to acknowledge the use of another's words with quotation marks;
3. Collusion: When more than one student or person contributes to a piece of work that is submitted as the work of an individual;
4. Conspiracy: Agreeing with one or more persons to commit an act of academic/scholastic dishonesty; and
5. Multiple Submission: Submission of work from one course to satisfy a requirement in another course without explicit permission. Example: using a paper prepared and graded for credit in one course to fulfill a requirement and receive credit in a different course.

Nonacademic Misconduct

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. The Office of Student Conduct will adjudicate such incidents under nonacademic procedures.

Sexual Misconduct

Sexual harassment of students and employees at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating the university's sexual harassment policy will be subject to disciplinary action. In accordance with the Texas A&M University System guidelines, your instructor is obligated to report to the Office of Title IX Compliance (titleixteam@pvamu.edu) any instance of sexual misconduct involving a student, which includes sexual assault, stalking, dating violence, domestic violence, and sexual harassment, about which the instructor becomes aware during this course through

writing, discussion, or personal disclosure. The faculty and staff of PVAMU actively strive to provide a learning, working, and living environment that promotes respect that is free from sexual misconduct, discrimination, and all forms of violence. If students, faculty, or staff would like assistance or have questions, they may contact the Title IX Coordinator at 936-261-2144 or titleixteam@pvamu.edu. More information can be found at www.pvamu.edu/titleix, including confidential resources available on campus.

Pregnancy, Pregnancy-related, and Parenting Accommodations

Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related conditions, or parenting (reasonably immediate postpartum period) are encouraged to contact Student Disability Services or the Dean of Students' Office for additional information and to request accommodations.

Non-Discrimination Statement

Prairie View A&M University does not discriminate on the basis of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation, or gender identity in its programs and activities. The University is committed to supporting students and complying with The Texas A&M University System non-discrimination policy. It seeks to establish an environment that is free of bias, discrimination, and harassment. If you experience an incident of discrimination or harassment, we encourage you to report it. If you would like to speak with someone who may be able to afford you privacy or confidentiality, there are individuals who can meet with you. The Director of Equal Opportunity & Diversity has been designated to handle inquiries regarding the non-discrimination policies and can be reached at Harrington Science Building, Suite 109 or by phone at 936-261-1744 or 1792.

Class Attendance Policy (See the University Online Catalog for Full Attendance Policy)

Prairie View A&M University requires regular class attendance. Attending all classes supports the full academic development of each learner, whether classes are taught with the instructor physically present or via distance learning technologies such as interactive video and/or the internet. Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in the assignment of a grade of "F." Absences are accumulated beginning with the first day of class during regular semesters and summer terms. Each faculty member will include the University's attendance policy in each course syllabus.

Student Academic Appeals Process

Authority and responsibility for assigning grades to students rest 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 University Online Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

Technical Considerations

Minimum Recommended Hardware and Software:

- Intel PC or Laptop with Windows 10 or later version; Mac with OS High Sierra*
- Smartphone or iPad/Tablet with Wi-Fi*
- High-speed Internet access
- 8 GB Memory
- Hard drive with 320 GB storage space
- 15" monitor, 800x600, color or 16 bit
- Sound card w/speakers
- Microphone and recording software
- Keyboard & mouse
- Most current version of Google Chrome, Safari, or Firefox

Note: Be sure to enable Java & pop-ups in the Web browser preferences

* Smartphones, Google Chrome books, and Android tablets may not be supported. iPads are the only tablets supported.

Participants should have a basic proficiency of the following computer skills:

- Sending and receiving email
- A working knowledge of the Internet
- Microsoft Word (or a program convertible to Word)
- Acrobat PDF Reader
- Windows or Mac OS
- Video conferencing software

Netiquette (online etiquette)

Students are expected to participate in all discussions and virtual classroom chats as directed. Students are to be respectful and courteous to others on discussion boards. Foul or abusive language will not be tolerated. Do not use ALL CAPS for communicating to others AS IT CAN BE INTERPRETED AS YELLING. Avoid slang terms such as "wassup?" and texting abbreviations such as "u" instead of "you." Limit and possibly avoid the use of emoticons. Be cautious when using humor or sarcasm as tone is sometimes lost in an email or discussion post, and the message might be taken seriously or sound offensive.

Video Conferencing Etiquette

When using Zoom, WebEx, or other video conferencing tools, confirm the visible area is tidy, clear of background clutter, inappropriate or offensive posters, and other distractions. Ensure you dress appropriately and avoid using high traffic or noisy areas. Stay muted when you are not speaking and avoid eating/drinking during the session. Before the class session begins, test audio, video, and lighting to alleviate technology issues.

Technical Support

Students should go to <https://mypassword.pvamu.edu/> if they have password issues. The page will provide instructions for resetting passwords and contact information if login issues persist. For other technical questions regarding eCourses, call the Center for Instructional Innovation and Technology Services at 936-261-3283 or email ciits@pvamu.edu.

Communication Expectations and Standards

Emails or discussion postings will receive a response from the instructor, usually in less than 48 hours. Urgent emails should be marked as such. Check regularly for responses.

Discussion Requirement

Online courses often require minimal to no face-to-face meetings. However, conversations about the readings, lectures, materials, and other aspects of the course can occur in a seminar fashion. The use of the discussion board will accomplish this. The instructor will determine the exact use of discussion boards.

It is strongly suggested that students type their discussion postings in a word processing application such as Word and save it to their PC or a removable drive before posting to the discussion board. This is important for two reasons: 1) If for some reason your discussion responses are lost in your online course, you will have another copy; 2) Grammatical errors can be greatly minimized by the use of the spell-and-grammar check functions in word processing applications. Once the post(s) have been typed and corrected in the word processing application, copy and paste to the discussion board.

COVID-19 Campus Safety Measures [NOTE: Delete this section when the COVID-19 pandemic is over]

To promote public safety and protect students, faculty, and staff during the coronavirus pandemic, PVAMU has adopted policies and practices to limit virus transmission.

- **Self-monitoring** - Students should follow CDC recommendations for self-monitoring. Students who have a fever or exhibit symptoms of COVID-19 should participate in class remotely and should not participate in face-to-face instruction.
- **Face Coverings** - Face coverings (cloth face covering, surgical mask, etc.) are recommended in classrooms, teaching laboratories, common spaces such as lobbies and hallways, public study

spaces, libraries, academic resource, and support offices, and outdoor spaces where 6 feet of physical distancing is challenging to maintain reliably.

- **Physical Distancing** - Physical distancing should be maintained between students, instructors, and others in course and course-related activities where possible.
- **Personal Illness and Quarantine** - Students required to quarantine are to participate in courses and course-related activities remotely and must not attend face-to-face course activities. Students should notify their instructors of the quarantine requirement. Students under quarantine are expected to participate in courses and complete graded work unless they have symptoms that are too severe to participate in course activities. Students experiencing personal injury or illness that is too severe for the student to attend class qualify for an excused absence. To receive an excused absence, students must provide appropriate documentation to the Office for Student Conduct, studentconduct@pvamu.edu.

End of Semester Course Assessment Report

This summary contains the following Information

1. Performance Statistics

- Total number of students in class
- The class average performance (**stated as %**) in each course outcome assessed in this class and the **two previous times course was assessed**.
- The acceptable class average for the class in each outcome area as set by the Department.
- Percentage of students who scored below the expected average in each outcome.

2. Implementation Summary

- Brief summary of plans implemented during the semester based on last assessment report or after meeting previous instructor.

3. Perceived Problems

- Instructor's critical **evaluation** of perceived problems that affected students' performance. **Realistic problems have been identified throughout the semester and summarized in this section of the report.**

4. New Plans for Addressing Problems

- Instructor's recommendations for addressing the perceived problems the next time the class is taught.

5. Overall Trend over last three assessment periods

- Instructor's recommendations for addressing the perceived problems the next time the class is taught.

6. Were Expectations Met?

- **YES** is the answer of this question if the **class average is above the expected average** and the **stated percentage of students** scores at or above the expected average, otherwise **NO** is the answer to this question.

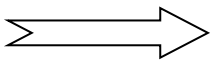
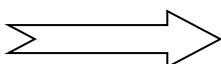
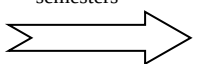
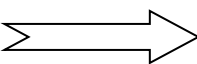
END OF SEMESTER COURSE OUTCOME ASSESSMENT REPORT

MCEG 3302 THERMODYNAMICS II, SECTION Y02

SPRING 2022 SEMESTER

Report Prepared by: Dr. Ziaul Huque

Report Date: May 23, 2022

Semester	Analysis Type	Number of Students	Outcome 2 An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.			
			Expected Class Average	Expected Percent of students at or above average	Class Average	% Students meeting Expected Average
Spring 2022	Direct	12	70	70	73	75
Fall 2021	Direct	11	70	70	77	72.7
Spring 2021	Direct	24	70	70	67	63.6
Implementation Summary	Items implemented from previous report or after meeting previous instructor		1. In class discussion about the process were done in class 2. Work expectations were also discussed			
Perceived Problems	Perceived problems are directly related to the PC and the sub items under them 		1. Students do not give expected effort on the class except before the exams 2. Background mathematics preparation is not adequate 3. Do not follow class lectures and procedures presented in the class properly indicating that they take preparation before exam and just follow the book. 4. Students had difficulty with online delivery during the online part of the class due to covid-19			
Recommendations for Addressing Problems	Plans for address specific measures to address PC and their sub areas 		The following are recommended for implementation: 1. Spend time on prerequisite materials, specifically Thermodynamics I contents, during the first week of class 2. Take an exam on prerequisite materials within the first two weeks 3. Breakdown the class lectures into smaller modules.			
Overall Trend over Periods	Ascertain if there were improvements over previous semesters 		There is a small increase in percentage of students meeting expected average from 72.7% in Fall 2021 to 75% in Spring 2022. It is also higher than 63.6% in Spring 2021. Therefore the trend is moving slowly upwards.			
Were Expectations Met?			YES			

**Grade Sheet Showing
Student and Class Performance in Outcomes**

**The computed semester average in each outcome as stated in the
assessment report is in red bold font.**

**Grade Sheet Showing Student and Class
Performance in Course Outcomes
MCEG 3302 Thermodynamics II, Section Y02
SPRING 2022 Semester**

Outcome				
Assignment Description		Project		Percentage
MAX POINTS		100		100
First name	Last name			
		76		76
		72		72
		72		72
		68		68
		72		72
		72		72
		68		68
		72		72
		68		68
		72		72
		68		68
		72		72
		72		72
		86		86
Average		73		73
Total No. of students		12		
No. of students above accepted AVG		9		
% of students above accepted AVG		75		

**OUTCOME SPECIFIC ASSIGNMENTS
USED TO ASSESS OUTCOMES**

ASSIGNMENTS FOR OUTCOME “2”

Ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematic

**MECHANICAL ENGINEERING DEPARTMENT
OUTCOMES SPECIFIC ASSIGNMENT COVER SHEET
THERMODYNAMICS II, SECTION Y01
SPRING 2022**

Instructor: Dr. Ziaul Huque

Title of Assignment

Test Problem: Design a basic Rankine cycle that uses water or refrigerant-134a as the working fluid and that produces the maximum amount of work from this energy source which is at 150 °C while rejecting heat to the ambient air at 40 °C.

Outcome Measured Using this Assignment

Outcome 2

An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

Check the complex engineering problem characteristics related to this assignment

Assignment problem	
	involves wide-ranging or conflicting technical issues,
x	has no obvious solution
	Addresses problems not encompassed by current standards and codes
	involves diverse groups of stakeholders
x	includes many component parts or sub-problems
	involves multiple disciplines
	has significant consequences in a range of contexts
Assignment problem involves the application of the principles of	
x	Engineering
	Science
	Mathematics

Brief Description of the suitability of this assignment for the outcome

Students need to compute net power output and cycle efficiency by varying the pressures of the heat addition process and heat rejection process. The constraints being the temperatures of the heat source and that of the heat sink. The students also need to demonstrate knowledge of optimization.

MCEG 3023 Thermodynamics II Course Project
Spring 2022
Design of a Vapor Power Plant

Due: May 10, 2022, at 1:00 pm

Taskstream submission is required.

PROJECT DESCRIPTION

In an electrical power plant the gases that come out of the boiler still has a good amount of energy. You are asked, as an engineer, to study the feasibility of using this energy as a source to produce additional electricity. The relevant conditions are as follows:

Stack gases exhausting from electrical power plants are at approximately 150 °C. Design a basic Rankine cycle that uses water or refrigerant-134a as the working fluid and that produces the maximum amount of work from this energy source while rejecting heat to the ambient air at 40 °C. You are to use a turbine whose efficiency is 90 percent and whose exit quality cannot be less than 80 percent.

REPORT REQUIREMENTS

A detailed report should be submitted for the project, and the following contents should be included:

1. (2%) A “Cover Page” with the course number and name, section number, semester, and your name. See the next page for a sample cover page.
2. (3%) A “Project Description” page that includes the original problem (as provided in the previous page of this document).
3. (5%) An “Abstract” page summarizing your design, your calculations/justifications, and other potential designs you would propose.
4. (75%) A detailed presentation of all technical components of your design (i.e., Tasks a-b in the “Project Description” section).
5. (5%) A conclusion section of your work

SUBMISSION

6. (10%) Upload your report in Microsoft Word format (.doc or .docx), which include all the contents described in the “Report Requirements” section, to both **Taskstream** and the **“Project Submission” portal on eCourses (Canvas)**.

**MECHANICAL ENGINEERING DEPARTMENT
PRAIRIE VIEW A&M UNIVERSITY**



**MCEG 3023-Y02
Thermodynamics II
Spring 2022**

COVER PAGE

**REPORT ON
“Design of a Simple Rankine Cycle”**

**Submitted by
YOUR NAME**

**On
May 10, 2022**

**To
Dr. Ziaul Huque**