



PHYS-1410-221CL
Applied Physics
Spring 2022
6:00 PM – 8:50 PM, Mondays and Wednesdays,
STEAM Building, Room 302

Instructor Information: Derek Smith, dsmith64@com.edu.

Student hours and location: Student hours will be held from 5:30 PM – 6:00 PM every class day in the lab room.

Required Textbook/Materials:

- Applied Physics Guide, 2nd Edition – available for free download on Blackboard.
- Applied Physics Lab Manual – sold at the college bookstore.

Course Description: This is a one-semester, non-calculus approach to the principles of force and motion, work and energy, fluids, heat and thermodynamics. The course is intended for students of process technology, other workforce students, and students seeking a foundation for further academic studies. The concepts of fluids, heat and thermodynamics are emphasized. Prerequisites: TECM-1303 and MATH-0320; or MATH-1314. This is an academic transfer course.

Course requirements:

Tests

- There will be *four tests* (non-cumulative) and *a final exam* (cumulative).
- There are *NO make-up exams (except emergencies, proof must be provided)* so please make every effort to not miss a test.

Laboratory Activities

- Students are required to perform lab work (as a group) and to individually complete lab homework assignments on Blackboard based on the activities of each lab.
- Lab homework assignments will have no time limit, but they must be completed prior to their due date.

Problem Sets (Blackboard)

- After each chapter, there will be problem sets assigned consisting of 10 to 15 questions.
- Problem sets will consist of conceptual questions and problems where you need to use some math to solve.
- Homework assignments will have deadlines and should be completed in time.
- Problem sets will have no time limit, but they must be completed prior to their due date.

Determination of Course Grade/Detailed Grading Formula:

<i>Type of Assessment</i>	<i>% of the FINAL grade</i>
<i>Problem Sets</i>	<i>30</i>
<i>Lab Homework</i>	<i>30</i>
<i>Four Tests</i>	<i>25</i>
<i>Final Exam</i>	<i>15</i>
Total	100

Percentage	Letter Grade
90 – 100%	A
80 – 90%	B
70 – 80%	C
60 – 70%	D
0 – 60%	F

Laboratory statement: This course consists of both a lecture and laboratory grade component. Students must earn a 70% or better in the laboratory component to successfully pass the course. Earning less than 70% in the laboratory component will result in an F for the course regardless of the lecture grade. Passing the laboratory component and failing the lecture component will not guarantee a passing grade for the course. Deviations from this policy will be at the sole discretion of the instructor.

Late Work, Make-Up, and Extra-Credit Policy: Students are expected to complete and submit assignments on time, but exceptions may be made with sufficient justification. Late work may receive a penalized grade, or not be accepted at all. Make-up work may also receive a grade penalty, depending on the situation as appropriate. Extra-credit may be assigned throughout the semester, but is not guaranteed. Any extra-credit assignments will be announced on Blackboard or in class.

Attendance Policy:

Given the hands-on nature of the laboratory, participation in this portion of the course is crucial. A student must successfully complete 75% (9 out of 12 labs) of all laboratory assignments to pass the laboratory portion. Failure to complete 75% of the laboratory assignments will result in a failing laboratory grade and a failing grade for the course. Documented excused absences (i.e. death in the family or a documented illness) will be handled on a case by case basis and at the discretion of the instructor.

Communicating with your instructor: ALL electronic communication with the instructor must be through your COM email. Due to FERPA restrictions, faculty cannot share any information about performance in the class through other electronic means.

Student Learner Outcome	Core Objective	Assessment Instrument
1. Demonstrate an understanding of basic Newtonian mechanics for the special case of one-dimensional motion.	Teamwork.	Labs 1-4. Students work in teams to achieve the objectives of each lab activity. Instructor will monitor and guide students to ensure that each member of each team is working effectively to achieve those objectives.
2. Demonstrate an understanding of basic work and energy concepts for the special case of one-dimensional motion.	Communication Skills (Written).	Labs 5-6. Students are guided through a written inquiry that requires them to develop, interpret, and express ideas in writing involving the relationships between work and energy. Instructor monitors these activities in real time and reviews the written passages.
3. Demonstrate an understanding of basic fluid properties and heat and temperature concepts.	Empirical and Quantitative Skills.	Labs 7-9. Students collect data, make observations and manipulations of that data in an attempt to arrive at an understanding of the relationship between heat and temperature of fluids. Students submit their conclusions in writing and complete a homework assignment.
4. Demonstrate an understanding of basic thermodynamics concepts.	Critical Thinking Skills.	Labs 10-12. Students develop skills through creative thinking and innovation as they develop their ability to analyze, evaluate, and synthesize the information associated with an understanding of the 1 st and 2 nd laws of thermodynamics. Students submit their written work and complete a homework assignment.

Academic Dishonesty: College of the Mainland is committed to a high standard of academic integrity. In becoming a part of the academic community, students are responsible for honesty and independent effort. Incidents of academic and scholastic dishonesty (including cheating, plagiarism and collusion) will be dealt with in a manner consistent with College Policy and the Student Handbook.

Violations may result in a penalty. The maximum penalty will be a grade of “F” for the course. Violations may also be reported to the Judicial Coordinator as instances of *Inappropriate Behavior*. Please see the section on Privileges and Obligations in the Student Handbook for a more complete discussion of *Inappropriate Behavior*, and of your rights and responsibilities.

Link(s) to resource(s) about ways to avoid plagiarism:

<http://en.writecheck.com/ways-to-avoid-plagiarism/>

Student Concerns: If you have any questions or concerns about any aspect of this course, please contact me using the contact information previously provided. If, after discussing your concern with me, you continue to have questions, please contact Professor Sheena Abernathy at 409-933-8330, or by email at sabernathy@com.edu.

Course outline:

Day	Reading Assignments	Assignments Due	Lab Activity
1/19	Syllabus		1. Introduction to Motion
1/24	Chapter 1	Lab 1 HW	2. Changing Motion
1/26	Chapter 2	Problem Set 1	2. Changing Motion
1/31	Chapter 3	Lab 2 HW	3. Passive Forces
2/2	Chapter 4	Problem Set 2	3. Passive Forces
2/7		Lab 3 HW	4. Force and Motion
2/9		Problem Set 3	4. Force and Motion
2/14	Test 1 Review	Lab 4 HW	
2/16		Test 1, Problem Set 4	
2/21	Chapter 5		5. Work and Energy
2/23			5. Work and Energy
2/28		Lab 5 HW	6. Conservation of Energy
3/2		Problem Set 5	6. Conservation of Energy
3/7	Test 2 Review	Lab 6 HW	
3/9		Test 2	
3/14-20	Sharknado	Spring Break	
3/21	Chapter 6		7. Introduction to Heat and Temperature
3/23			7. Introduction to Heat and Temperature
3/28	Chapter 7	Lab 7 HW	8. Energy Transfer and Temperature Change
3/30		Problem Set 6	8. Energy Transfer and Temperature Change
4/4		Lab 8 HW	9. Heat Energy Transfer
4/6		Problem Set 7	9. Heat Energy Transfer
4/11	Test 3 Review	Lab 9 HW	
4/13		Test 3	
4/18	Chapters 8, 9		10. First Law of Thermodynamics
4/20	Chapter 10		10. First Law of Thermodynamics
4/25	Chapter 11	Lab 10 HW	11. The Ideal Gas Law
4/27		Problem Sets 8, 9	
5/2	Test 4 Review	Problem Set 10, Lab 11 HW	12. Heat Engines
5/4		Test 4, Problem Set 11	
5/9		Lab 12 HW	
5/11		Final Exam	

Changes to this schedule may occur at the discretion of the instructor, and will be announced **in class and on Blackboard.**

Institutional Policies and Guidelines

Grade Appeal Process: Concerns about the accuracy of grades should first be discussed with the instructor. A request for a change of grade is a formal request and must be made within six months of the grade assignment. Directions for filing an appeal can be found in the student handbook. <https://build.com.edu/uploads/sitecontent/files/student-services/Student_Handbook_2019-2020v5.pdf. *An appeal will not be considered because of general dissatisfaction with a grade, penalty, or outcome of a course. Disagreement with the instructor's professional judgment of the quality of the student's work and performance is also not an admissible basis for a grade appeal.* https://build.com.edu/uploads/sitecontent/files/student-services/Student_Handbook_2019-2020v5.pdf

Academic Success & Support Services: College of the Mainland is committed to providing students the necessary support and tools for success in their college careers. Support is offered through our Tutoring Services, Library, Counseling, and through Student Services. Please discuss any concerns with your faculty or an advisor.

ADA Statement: Any student with a documented disability needing academic accommodations is requested to contact Holly Bankston at 409-933-8520 or hbankston@com.edu. The Office of Services for Students with Disabilities is located in the Student Success Center.

Counseling Statement: Any student needing counseling services is requested to please contact Holly Bankston in the student success center at 409-933-8520 or hbankston@com.edu. Counseling services are available on campus in the student center for free and students can also email counseling@com.edu to set up their appointment. Appointments are strongly encouraged; however, some concerns may be addressed on a walk-in basis.

Textbook Purchasing Statement: A student attending College of the Mainland is not under any obligation to purchase a textbook from the college-affiliated bookstore. The same textbook may also be available from an independent retailer, including an online retailer.

Withdrawal Policy: Students may withdraw from this course for any reason prior to the last eligible day for a "W" grade. Before withdrawing students should speak with the instructor and consult an advisor. Students are permitted to withdraw only six times during their college career by state law. The last date to withdraw from the 1st 8-week session is March 2. The last date to withdraw from the 16-week session is April 25. The last date to withdraw for the 2nd 8-week session is May 4.

F_N Grading: The F_N grade is issued in cases of *failure due to a lack of attendance*, as determined by the instructor. The F_N grade may be issued for cases in which the student ceases or fails to attend class, submit assignments, or participate in required capacities, and for which the student has failed to withdraw. The issuing of the F_N grade is at the discretion of the instructor. The last date of attendance should be documented for submission of an F_N grade.

Early Alert Program: The Student Success Center at College of the Mainland has implemented an Early Alert Program because student success and retention are very important to us. I have been asked to refer students to the program throughout the semester if they are having difficulty completing assignments or have poor attendance. If you are referred to the Early Alert Program you will be contacted by someone in the Student Success Center who will schedule a meeting with you to see what assistance they can offer in order for you to meet your academic goals.

COVID-19 Statement: All students, faculty, and staff are expected to familiarize themselves with materials and information contained on the College of the Mainland's Coronavirus Information site at www.com.edu/coronavirus. In compliance with Governor Abbott's May 18 Executive Order, face coverings/masks will no longer be required on COM campus. Protocols and college signage are being updated. We will no longer enforce any COM protocol that requires face coverings. We continue to encourage all members of the COM community to distance when possible, use hygiene measures, and get vaccinated to protect against COVID-19. Please visit com.edu/coronavirus for future updates.