Advanced Physics I – PHYS 2425

Course Syllabus: Fall 2017

"Northeast Texas Community College exists to provide responsible, exemplary learning opportunities."

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Office Hours	Monday	Tuesday	Wednesday	Thursday	Friday	Online
	3:00 – 5:00	3:00 – 6:00	3:00 – 5:30	3:00 – 5:30	By Appointment	

The information contained in this syllabus is subject to change without notice. Students are expected to be aware of any additional course policies presented by the instructor during the course.

Catalog Course Description (include prerequisites):

4 credit hours
Lecture/Lab/Clinical: Three hours of lecture and three hours of lab each week.
Prerequisite: MATH 2413 (completed or concurrent)

This is a calculus based course intended for students majoring in computer science, engineering, mathematics, phyiscs, or related fields of study. Topics inclue 1-D motion, 2-D motion, rotational motion, Newton's laws, energy, momentum, equilibrium, gravity, oscillatory motion, waves, and heat.

Required Textbook(s): Young, Freedman, and Ford. *University Physics with Modern Physics*, 14th Edition. Pearson, 2016
Publisher: Pearson
ISBN Number: 978-0-321-97361-0

Recommended Reading(s):

The Cartoon Guide to Physics, by Larry Gonick and Art Huffman
** This book will not be referenced in class, but can serve as a convenient, alternate explanation for difficult concepts.

Student Learning Outcomes: Upon successful completion of this course, students should (1) *understand advanced qualitative concepts*, and (2) *solve calculus problems of physics relating to* (1-7 below):

2425.1) Determine the components of linear motion (displacement, velocity, and acceleration), and especially motion under conditions of constant acceleration.
2425.2) Apply Newton's Laws to physical problems and solve problems involving forces and work.
2425.3) Identify the different types of energy and solve problems using principles of conservation of energy.
2425.4) Define the principles of impulse, momentum, and collisions and use the principles to solve problems involving momentum.
2425.5) Discuss rotational kinematics and dynamics and the relationship between linear and rotational motion, including center of mass and center of rotation, and use these concepts to solve problems involving rotational and linear motion.
2425.6) Define equilibrium, including the different types of equilibrium.
2425.7) Discuss simple harmonic motion and its application to real-world problems.

2425L.1) Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner and evaluate the accuracy of physical measurements and potential sources of error in measurements.
2425L.2) Relate physical observations and measurements involving classical mechanics to theoretical principles.
2425L.3) Design fundamental experiments involving principles of classical mechanics.

Core Curriculum Purpose and Objectives:

Through the core curriculum, students will gain a foundation of knowledge of human cultures and the physical and natural world; develop principles of personal and social responsibility for living in a diverse world; and advance intellectual and practical skills that are essential for all learning.

Courses in the foundation area of mathematics focus on quantitative literacy in logic, patterns, and relationships. In addition, these courses involve the understanding of key mathematical concepts and the application of appropriate quantitative tools to everyday experience.

College Student Learning Outcomes:

Critical Thinking Skills

CT.1 Students will demonstrate the ability to 1) analyze complex issues, 2) synthesize information, and 3) evaluate the logic, validity, and relevance of data.

Communication Skills

CS.1 Students will effectively develop, interpret and express ideas through written communication.

Empirical and Quantitative Skills

EQS.1 Students will manipulate numerical data or observable facts by organizing and converting relevant information into mathematical or empirical form
EQS.2 Students will analyze numerical data or observable facts by processing information with correct calculations, explicit notations, and appropriate technology.
EQS.3 Students will draw informed conclusions from numerical data or observable facts that are accurate, complete, and relevant to the investigation.

Teamwork

TW.2 Students will work with others to support and accomplish a shared goal.

SCANS Skills:
N/A

Course Outline:
Chapter 1: Units, Physical Quantities, and Vectors
Chapter 2: Motion Along a Straight Line
Chapter 3: Motion in Two or Three Dimensions
Chapter 4: Newton's Laws of Motion
Chapter 5: Applying Newton's Laws
Chapter 6: Work and Kinetic Energy
Chapter 7: Potential Energy and Energy Conservation
Chapter 8: Momentum, Impulse, and Collisions
Chapter 9: Rotation of Rigid Bodies
Chapter 10: Dynamics of Rotational Motion
Chapter 11: Equilibrium and Elasticity
Chapter 13: Gravitation
Chapter 14: Periodic Motion
Chapter 15: Mechanical Waves
Chapter 17: Temperature and Heat

Evaluation/Grading Policy:
Homework will represent 15% of your grade. There will be 5 tests and a Final Exam. The average of all tests will represent 60% of your grade. Laboratory work will represent 15% of your grade. SI tutorials (2 hours minimum per week) will be the final 10% of your grade. The letter grading system is:

A (90% - 100%)
B (80% - 89%)
C (70% - 79%)
D (60% - 69%)
F (< 60%)

Tests / Exams:

TEST 1: Chapters 1-2
TEST 2: Chapters 3-5
TEST 3: Chapters 6-8
TEST 4: Chapters 9-11, 13
TEST 5: Chapters 14, 15, 17
FINAL EXAM: Chapters 1-11, 13-15, 17

Other Course Requirements

You will need a scientific calculator or graphing calculator for this class. A TI-Nspire CX is recommended but not required.

Student Responsibilities/Expectations:

Regular and punctual attendance at all scheduled classes and labs is expected. There will be no make-up assignments.

NTCC Academic Honesty Statement:

"Students are expected to complete course work in an honest manner, using their intellects and resources designated as allowable by the course instructor. Students are responsible for addressing questions about allowable resources with the course instructor. NTCC upholds the highest standards of academic integrity. This course will follow the NTCC Academic Honesty policy stated in the Student Handbook."

Academic Ethics

The college expects all students to engage in academic pursuits in a manner that is beyond reproach. Students are expected to maintain complete honesty and integrity in their academic pursuit. Academic dishonesty such as cheating, plagiarism, and collusion is unacceptable and may result in disciplinary action. Refer to the student handbook for more information on this subject.

ADA Statement:

It is the policy of NTCC to provide reasonable accommodations for qualified individuals who are students with disabilities. This College will adhere to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student's responsibility to request accommodations. An appointment can be made with Shannin Garrett, Academic Advisor/Coordinator of Special Populations located in the College Connection. She can be reached at 903-434-8218. For more information and to obtain a copy of the Request for Accommodations, please refer to the NTCC website – Special Populations.

Family Educational Rights And Privacy Act (Ferpa):
The Family Educational Rights and Privacy Act (FERPA) is a federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education. FERPA gives parents certain rights with respect to their children's educational records. These rights transfer to the student when he or she attends a school beyond the high school level. Students to whom the rights have transferred are considered "eligible students." In essence, a parent has no legal right to obtain information concerning the child's college records without the written consent of the student. In compliance with FERPA, information classified as "directory information" may be released to the general public without the written consent of the student unless the student makes a request in writing. Directory information is defined as: the student's name, permanent address and/or local address, telephone listing, dates of attendance, most recent previous education institution attended, other information including major, field of study, degrees, awards received, and participation in officially recognized activities/sports.

6 Drop Rule: "Students who enrolled in Texas public institutions of higher education as first-time college students during the Fall 2007 term or later are subject to section 51.907 of the Texas Education Code, which states that an institution of higher education may not permit a student to drop (withdraw with a grade of "W") from more than six courses. This six-course limit includes courses that a transfer student has previously dropped at other Texas public institutions of higher education if they fall under the law. Students should be sure they fully understand this drop limit before they drop a course. Please visit the admissions office or counseling/advising center for additional information and assistance."

Other Course Policies:
There will be no cell phone usage in the classroom. One warning for cell phone use will be issued, any further use will result in removal from class.

Campus Safety: Northeast Texas Community College (NTCC) is committed to maintaining the safety of the students, faculty, staff, and guests while visiting any of our campuses. See NTCC's website for details and to receive emergency notifications automatically by phone. In the event of an emergency contact NTCC Police at 903-434-8127.