



PHYS 2425 881 – Advanced Physics I

Course Syllabus: Summer 1 2026

“Northeast Texas Community College exists to provide personal, dynamic learning experiences empowering students to succeed.”

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Weekday	Office Hours
Monday	Online
Tuesday	Online
Wednesday	Online
Thursday	Online
Friday	Online

This syllabus serves as the documentation for all course policies and requirements, assignments, and instructor/student responsibilities.

Information relative to the delivery of the content contained in this syllabus is subject to change. Should that happen, the student will be notified.

Course Description:

Four credit hours. This course is a calculus-based physics course intended for students majoring in computer science, engineering, mathematics, physics, or related fields of study. Topics include 1-D motion, 2-D motion, rotational motion, Newton’s Laws, energy, momentum, equilibrium, gravity, oscillatory motion, waves, and heat.

Prerequisite(s): Math 2413

Student Learning Outcomes:

1. Determine the components of linear motion (displacement, velocity, and acceleration) and especially motion under conditions of constant acceleration.
2. Solve problems involving forces and work.
3. Apply Newton’s Laws to physical problems.
4. Identify the different types of energy.
5. Solve problems using principles of conservation of energy.
6. Define the principles of impulse, momentum, and collisions.
7. Use principles of impulse and momentum to solve problems.
8. Determine the location of the center of mass and center of rotation for rigid bodies in motion.
9. Discuss rotational kinematics and dynamics and the relationship between linear and rotational motion.
10. Solve problems involving rotational and linear motion.
11. Define equilibrium, including the different types of equilibrium.
12. Discuss simple harmonic motion and its application to real-world problems.

- L1. Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner.

- L2. Conduct basic laboratory experiments involving classical mechanics.
- L3. Relate physical observations and measurements involving classical mechanics to theoretical principles.
- L4. Evaluate the accuracy of physical measurements and the potential sources of error in the measurements.
- L5. Design fundamental experiments involving principles of classical mechanics.
- L6. Identify appropriate sources of information for conducting laboratory experiments involving classical mechanics.

Evaluation/Grading Policy:

The breakdown of the course requirements is as follows:

%	Requirement
60%	Exams
15%	Assignments
15%	Quizzes
10%	Labs

Semester grades will be earned as follows

Percentage	Letter Grade
90% and above	A
80% – 89%	B
70% – 79%	C
60% – 69 %	D
59.9% and below	F

Assignments consists of questions / problems from the chapters administered through Webassign. These problems can be reworked up to five times with decreasing credit for each attempt. The last grade earned for each assignment will be posted in the Blackboard gradebook. There are no extensions on due dates in order to maintain the course schedule.

Quizzes consists of short summary questions / problems over the chapter assignments. These are multiple choice and free response type questions. The quizzes are located and completed in the Blackboard content page in the “Quizzes” folder. These are timed assignments and must be completed in one session.

Laboratory work is completed through the Lab Procedures found in the Blackboard content page. Obtain the lab kit from the NTCC college store according to their instructions. Because students receive their lab kits at different times, I have set the due dates for the lab assignments beginning in the middle of the semester. However, I encourage you to perform the labs concurrently with the course materials to reinforce your understanding of the

concepts as much as possible.

There are two exams administered through Webassign at scheduled windows during the semester. The exam sessions are required to be recorded with a web cam while producing a screen share using TEAMS. The instructions are shown in the TEAMS folder on the content page of Blackboard. (Failure to produce an acceptable video / screen share with materials in full view will result in a 60 point maximum exam score.) The exams allow two attempts for each individual question for diminishing credit. There is a three hour time limit for each exam, and the exams must be completed in a single session (the timer does not stop once you begin the exam). There are no makeup exams available if you miss a due date.

Webassign grades are automatically imported into Blackboard throughout the semester. If you see a grade in Blackboard that does not match an assignment grade in Webassign, it probably was in progress at the time of refreshing. Check back to see if it updates. The Blackboard gradebook is the official course grade since it is home to the quizzes and labs.

Required Instructional Materials:

Publisher: Cengage Learning

ISBN Number: 978-1-337-55327-8

Optional Instructional Materials:

Minimum Technology Requirements:

You will need a scientific calculator for this class.

Required Computer Literacy Skills:

Ability to access the internet and upload documents and pictures to apps.

Course Structure and Overview:

Chapter 2 Motion in One Dimension

Chapter 3 Vectors

Chapter 4 Motion in Two Dimensions

Chapter 5 Laws of Motion

Chapter 6 Circular Motion and Other Applications of Newton's Laws

Chapter 7 Energy of a System

Chapter 8 Conservation of Energy

Chapter 9 Linear Momentum and Collisions

Exam 1

Chapter 10 Rotation of a Rigid Object About a Fixed Axis

Chapter 13 Universal Gravitation

Chapter 15 Oscillatory Motion

Chapter 16 Wave Motion

Chapter 17 Superposition and Standing Waves

Exam 2

Communications:

The college's official means of communication is via your campus email address. I will use your campus email address and Blackboard announcements / messages to communicate with you outside of class. Make sure you keep your campus email cleaned out and below the limit so you can receive important messages.

Institutional/Course Policy:

Alternate Operations During Campus Closure and/or Alternate Course Delivery Requirements:

In the event of an emergency or announced campus closure due to a natural disaster or pandemic, it may be necessary for Northeast Texas Community College to move to altered operations. During this time, Northeast Texas Community College may opt to continue delivery of instruction through methods that include, but are not limited to, online through the Blackboard Learning Management System, online conferencing, email messaging, and/or an alternate schedule. It is the responsibility of the student to monitor NTCC's website (<http://www.ntcc.edu/>) for instructions about continuing courses remotely, Blackboard for each class for course-specific communication, and NTCC email for important general information.

Additionally, there may be instances where a course may not be able to be continued in the same delivery format as it originates (face-to-face, fully online, live remote, or hybrid). Should this be the case, every effort will be made to continue instruction in an alternative delivery format. Students will be informed of any changes of this nature through email messaging and/or the Blackboard course site.

Statement Regarding the Use of Artificial Intelligence (AI) Technology:

Employees and students shall be permitted to explore artificial intelligence (AI) and implement its use in and out of the classroom in accordance with policy and administrative regulations. The use of AI shall only be as a support tool to enhance student outcomes or as necessary to engage in research and shall never take the place of faculty, staff, and student decision-making. Any use of AI must comply with law, policy, and administrative regulations relating to student and employee privacy and data security. A student shall only use AI tools with faculty permission and shall be expected to produce original work and properly credit sources, including AI tools used in creating the work.

Example:

APA (7th edition)

OpenAI. (2026). ChatGPT (March 25 version) [Large language model]. <https://chat.openai.com/>

MLA (9th edition)

OpenAI. ChatGPT. 25 Mar. 2026, <https://chat.openai.com/>.

Employees or students who use AI tools to deceptively harm, bully, or harass others shall be disciplined in accordance with policy. [See DH, DIA series, FFD series, FFE, FLB, and the FM series] AI Use by Employees and Students. Northeast Texas Community College 225500 TECHNOLOGY RESOURCES CRB ARTIFICIAL INTELLIGENCE (LOCAL) DATE ISSUED: 12/8/2025 1 of 1 UPDATE 50 CRB(LOCAL)-AJC Adopted: 12/16/2025

NTCC Academic Honesty/Ethics Statement:

NTCC upholds the highest standards of academic integrity. The college expects all students to engage in their academic pursuits in an honest manner that is beyond reproach using their intellect and resources designated as allowable by the course instructor. Students are responsible for addressing questions about allowable resources with the course instructor. Academic dishonesty such as cheating, plagiarism, and collusion is unacceptable and may result in disciplinary action. This course will follow the NTCC Academic Honesty and Academic Ethics policies stated in the Student Handbook. Refer to the student handbook for more information on these subjects.

ADA Statement:

It is the policy of NTCC to provide reasonable accommodation 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 accommodation as required to afford equal educational opportunity. It is the student's responsibility to request accommodation. An appointment can be made with the Academic

Advisor/Coordinator of Special Populations located in Student Services and can be reached at 903-434-8264. For more information and to obtain a copy of the Request for Accommodations, please refer to the special populations page on the NTCC website.

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.

Tentative Course Schedule:

Chap.	Title	Week	Key Due Dates*
2	Motion in One Dimension	1	
3	Vectors	1	
4	Motion in Two Dimensions	1 – 2	
5	Laws of Motion	2	
6	Circular Motion and Other Applications of Newton's Laws	2	
7	Energy of a System	2	
8	Conservation of Energy	2	
9	Linear Momentum and Collisions	2 - 3	
10	Rotation of a Rigid Object About a Fixed Axis	2 - 3	
	Exam 1		6/24/26
13	Universal Gravitation	3	
15	Oscillatory Motion	3 - 4	
16	Wave Motion	4	
17	Superposition and Standing Waves	4 - 5	
	Exam 2		7/8/26