

**PHYSICS 1710.002**  
**Mechanics and Thermodynamics**  
**Fall 2010**

Lecture Section 002, Physics Room 102, TuTh 12:30 pm–1:50 p.m.  
Recitation Sections 211, 212, 213

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**Text:** *Physics for Scientists and Engineers*, 8<sup>th</sup> Edition (2008), by Raymond Serway and John Jewett, Thomson–Brooks/Cole. An optional Student’s Solutions Manual and Power Notes notebook are also available. You will also need a Responsive Innovations Response Card, Part No. RCRF-01, distributed by Turning Technologies, LLC.

**Topics and General Information:** This course will introduce the laws of motion, inertia, acceleration, force, energy, momentum, angular momentum, conservation laws, rotational and oscillatory motion, gravitation, and thermodynamics.

**Attendance/Participation:** You are expected to attend all lectures and recitations for the section in which you are enrolled; your grade will depend upon your attendance and participation in class. You will be expected to bring your Response Card with you to class, and participate in answering in-class questions

**Exams:** There will be three 90-minute exams during the semester, to be given starting at 4:15 p.m. on Monday afternoons, and a comprehensive final exam, to be given at 4:00 p.m. on Monday, December 13. **All exams will be administered in the Physics Building.** Exam questions will be based on lecture material, material contained in the text and in the homework assignments. You must show all of your work on your exam papers for full credit. Questions pertaining to the grading of exam questions and problems must be directed to the instructor in writing within two weeks after the exams are returned. There will be no makeup exams.

**Homework:** All homework will be posted, collected, and graded via the internet. You will also be required to keep a homework notebook with your written solutions, which will be collected twice weekly and graded. You must download your assignment each week, work the problems, and submit your solutions to the server by the due date indicated on the server. Your neatly written solutions to all the homework problems must put in the mailbox labeled “1710 – Rostovtsev” near the south end of the 2<sup>nd</sup> floor hallway in the Physics Building by the same due date and time as for the homework on the server. Details of accessing the homework server are given on the fourth page of this syllabus. Address all problems with the homework server to your instructor. Selected homework problems will be discussed in recitation.

**Grade:** The grading in the course will be based on the total points earned from exams, homework, and lecture and recitation attendance/short quizzes. The point values for each category are given below:

Exams	1 <sup>st</sup> exam: 125 points; 2 <sup>nd</sup> exam 150 points; 3 <sup>rd</sup> exam 175 points 300 points for the final*
Homework	150 points
Lecture & Recitation	50 points for lecture participation, 50 points for recitation quizzes
Bonus Problems	_____
<b>Total</b>	<b>1000 points</b>

\*If your final exam grade is higher than your overall grade calculated by the method indicated above, your final exam grade will be used for your course grade.

**Lab Credit:** You must enroll separately in Physics 1730 for laboratory science credit.

*The University of North Texas is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 92-112 – The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act (ADA), pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.*

**Fall 2010**  
**Physics 1710.002**  
**Tentative Lecture Schedule**

<b>Session</b>	<b>Date</b>	<b>Day</b>	<b>Chapter, Lecture Topic</b>
1	Aug. 26	Th	Introduction, Ch. 1, Measurement
2	Sept. 2	Tu	Ch. 2, Motion in One Dimension
3	Sept. 4	Th	Ch. 3, Vectors
4	Sept. 7	Tu	Ch. 4, Motion in Two and Three Dimensions
5	Sept. 9	Th	Multi-D motion continued
6	Sept. 14	Tu	Ch. 5, Laws of Motion—1 <sup>st</sup> law, 2 <sup>nd</sup> and 3 <sup>rd</sup> Laws
7	Sept. 16	Th	Applications
8	Sept. 21	Tu	Ch. 6, Circular Motion;
9	Sept. 23	Th	Ch. 7, Energy and Work
<b>XM1</b>	<b>Sept. 27</b>	<b>Exam 1—Ch. 1-5: Monday, Sept. 27, 4:15 p.m., Physics Bldg. First Floor</b>	
10	Sept. 28	Tu	Ch. 8, Conservation of Energy—Kinetic Energy , Potential Energy
11	Sept. 29	Th	Energy Conservation and applications
12	Oct. 5	Tu	Ch. 9, Linear Momentum and Collisions , Conservation of linear momentum
13	Oct. 7	Th	Impulse
14	Oct. 12	Tu	Ch. 10, Rotation, Moments of inertia
15	Oct. 14	Th	Rotation continued
16	Oct. 21	Tu	Ch. 11, Angular Momentum—conservation of L, 2 <sup>nd</sup> law for rotator motion
17	Oct. 23	Th	Applications
<b>XM2</b>	<b>Oct. 25</b>	<b>Exam 2—Ch. 6-10: Monday, Oct. 25, 4:15 p.m., Physics Bldg. First Floor</b>	
18	Oct. 26	Tu	Ch. 13, Gravitation, Satellites, orbits and free fall
19	Oct. 28	Th	Escape velocity
20	Nov. 2	Tu	Ch. 15, Oscillatory Motion, Hooke's Law
21	Nov. 4	Th	Simple Harmonic Motion
22	Nov. 9	Tu	Ch. 16, Wave Motion, Wave propagation
23	Nov. 11	Th	Ch. 17, Doppler Effect
24	Nov. 16	Tu	Ch. 18, Superposition and Standing Waves;
25	Nov. 18	Th	Ch. 19, Temperature, Ideal Gas Law
<b>XM3</b>	<b>Nov. 22</b>	<b>Exam 3—Ch. 10, 11, 13, 15-18: Monday, Nov. 22, 4:15 p.m., Physics Bldg. First Floor</b>	
26	Nov. 23	Tu	Ch. 20, First Law of Thermodynamics.
—	Nov. 25	Th	<i>No class Thursday – Thanksgiving break</i>
27	Nov. 30	Tu	Ch. 21, Kinetic Theory of Gases
28	Dec. 2	Th	Ch. 22, Entropy and the Second Law of Thermodynamics
29	Dec. 7	Tu	Ch. 22 continued.
30	Dec. 9	Th	Last day of class—Review

**FINAL EXAM—Comprehensive—Monday, Dec. 13, 4:00-6:00 p.m., Physics Bldg. First Floor**

## Physics 1710 Goals and Learning Strategies

The goals of instruction in Physics 1710 are to lead and to guide you to master the fundamentals of elementary classical mechanics and thermodynamics, to construct in yourself a fundamental understanding of these topics, to develop your skills of analysis using the mathematical tools of algebra and calculus, and to cultivate an interest in and an appreciation for physics in nature and in the human experience. To help in achieving these goals you are requested to pursue the following strategies:

- (1) **Read the text chapter within the forty-eight hours prior to the class.** You should bring your questions to class or e-mail to the instructor prior to the morning of the class.
- (2) During class, **listen, observe, take notes, analyze, discuss with peers, answer questions, solve in-class problems and respond promptly via the ResponseCard™** technology as directed by your instructor.
- (3) **Review your textbook chapter summary and your notes** within twenty-four hours after class.
- (4) **Work the assigned problems** only after you have read and reviewed the material of the chapter.
- (5) **Respond via e-mail** to [rost@unt.edu](mailto:rost@unt.edu) or during office hours whenever you have an observation or question.
- (6) **Come to class prepared:** bring a calculator, your text book and, above all, your ResponseCard™ in order to participate and take full advantage of the lecture hall learning experience.

In this course we are using an Electronic Student Participation system. After you have given the instructor your hand-held keypad identification number, you will be able to respond to questions, quizzes and polls that the instructor poses during the lecture and receive credit for participation, as well as immediate feedback and assessment of your understanding. **Only when you participate via the keypad will you be credited with attending the class,** after the initial enrollment period. The motivation for this technology is an improved and more effectual learning environment. The procedure will be as follows:

- (1) You will see a PowerPoint™ slide presented that asks a question.
- (2) You will be given time to think about the question and select from several possibilities by depressing the letter or number on your keypad corresponding to your choice.
- (3) You will confirm that the system has accepted your input when your Participant ID number changes color on the screen.
- (4) Your answer will be recorded for the instructor to credit you with participation, and the overall results of the activity can be presented to the class in real time as programmed by the instructor.

### **To make your ResponseCard™ work in the lecture hall:**

- (1) Register your clicker by going to this course in Blackboard Vista (see section on Ancillary Materials about accessing this). You must provide the instructor with the six-character alpha-numeric code located on the back of your keypad, immediately underneath the bar code.
- (2) You must set the keypad channel to match that of the receiver in the lecture hall. Do so by depressing “GO” (causing the keypad LED to blink red-green) followed by “0” and “2.” At this point, if the LED is green, you are ready. If the LED continues to flash, press “GO” one more time, which should cause the LED to become green.

Note: If your card does not respond at all, the most likely problem is that the batteries have failed. Please have it checked in the Physics Instructional Center (PIC) in Room 209 of the Physics Building.

## Homework Information

All homework will be posted, collected, and graded via the internet. We will be using the homework service provided by the University of Texas at Austin. You must download your assignment, work the problems, and submit your solutions to the server by the due date and time indicated on the server. To access the homework server for the first time, go to <http://cns.utexas.edu/quest/support/student/> and follow the instructions given there for Off Campus Student Enrollment. The unique number for this course and section is **17102**. **You must do this as soon as possible**. Once you successfully log into the UT system, read the information accessible through the *Help* link in the Quest toolbar about how to obtain your homework and submit solutions. Address all problems with the homework server to your instructor.

Please note that some problems in any given assignment may not be for credit. You can identify which problems are for credit by looking at the point value immediately after the problem number. The problems assigned zero credit are for your extra practice if you choose to take advantage of them, which you are encouraged to do.

You will also be required to keep a homework notebook with your written solutions, which will be collected twice weekly and graded. Your neatly written solutions to all the homework problems must put in the mailbox labeled “1710 – Rostovtsev” near the south end of the 2<sup>nd</sup> floor hallway in the Physics Building by the same due date and time as for the homework on the server. It is recommended that you use loose-leaf paper and just turn in one week’s work at a time because of space restraints. Be sure to staple all your work together and **put your name on your papers**. Your graded work will be returned to you in the alphabetized column of open boxes labeled “Physics 1710” to the right of where homework is handed in. Every effort will be made to return graded homework to these boxes within one week of the due date. *It is recommended that you photocopy your work before handing it in.*

Selected homework problems will be discussed in recitation.

Homework grading policy:

- a. The computer-generated score is to be the starting point for determining your grade.
- b. If you have earned computer credit for a problem, you must show sufficient work in your written HW to retain that credit. For each such problem, the grader will verify that:
  - i. there is an explanation of the problem’s solution in your written work;
  - ii. the solution presented is reasonable, i.e., essentially correct as shown;
  - iii. there is sufficient detail in the explanation to allow someone to understand all the steps of the solution.If these three conditions are clearly not met, then you will receive reduced or no credit for the problem.
- c. If you are unsuccessful in obtaining the correct numerical solution to a problem, but have done work that you believe to be conceptually correct, **indicate clearly on your written solutions that you would like the problem to be graded for partial credit**. These problems will be graded on the basis of the correctness of the work presented, and may be assigned up to 90% of full credit.

## Ancillary Materials

Blackboard Vista 4.2 will be used to post some useful course materials and your grades. To get to this resource, go to <http://ecampus.unt.edu> and follow the UNT link to log on. (You will log on using your UNT EUID and password.) Once logged on, select this course. You will find an electronic copy of this syllabus, copies of the Power Point presentations from lecture, copies of old exams with keys, the equation sheets for exams, and you will be able to access your exam and quiz grades. Please note that if you wish to communicate with the instructor via email, you will get a much faster response if you use [rost@unt.edu](mailto:rost@unt.edu) instead of the mail facility in Blackboard.

Also available for your extra problem-solving practice is a text similar to the one used for this class, with a full set of solutions for all of the problems in the backs of the chapters. These materials are on reserve in the Science and Technology Library.

A Help Room (Physics Room 117) is staffed weekday afternoons by a teaching assistant to assist you with questions regarding any aspect of the course, including homework assignments. Hours will be posted on the door of the Help Room, as well as at the beginning of lecture. TA contact information will also be posted on the Help Room Door.

## Note to Members of TAMS

The Texas Academy of Mathematics and Science (TAMS) administration has made the followings statement and has asked us to include it in our syllabus for members of the Academy:

***Class attendance and participation is required. Students must be alert, attentive, energetic, and eager to learn. Students who exhibit disruptive behavior or show disrespect to a teacher in the classroom are subject to severe disciplinary sanctions. The Academy does not authorize absences from class. Students must report all absences to the Academic Office within 36 hours of the absence by completing a form in the Academic Office. A student will be assessed 5 disciplinary points for each class absence, unless the absence can be justified. Faculty will also be reporting absences to the Academic Office. A student will be assessed 15 disciplinary points for failure to report an absence that is reported by a faculty member.***

If you are a TAMS student and if you are absent for any reason, you are required to file an absence report with the TAMS Academic Office in Marquis Hall 134.