PHYSICS 1710
Mechanics and Thermodynamics
Fall 2016
Lecture Section 002, PHYS 102, TR 12:30–1:50 p.m.
Recitation Section 211, PHYS 104, MW 8:00–8:50 a.m.
Recitation Section 212, MATT 108, MW 4:00–4:50 p.m.
Recitation Section 213, MATT 108, MW 3:00–3:50 p.m.

Professor: Duncan Weathers
Office: Physics Bldg., Room 003
Telephone: (940) 565-2079
E-mail: weathers@unt.edu
Office Hours: M 2:00-3:00 p.m., R 2:00–3:00 p.m., and by appointment

Course Materials: The recommended text is *University Physics*, 13th or 14th Edition, by Young and Freedman (Pearson). Other calculus-based introductory physics texts are acceptable; the successful student will have a text. You are required to obtain access to the Expert TA online homework system, and bring a Wi-Fi device with REEF Polling to class.

Topics: This course will introduce fundamental concepts from classical mechanics including velocity, acceleration, inertia, force, the laws of motion, work and energy, linear momentum, angular momentum, mechanical conservation laws, rotational and oscillatory motion, waves, and gravitation; and fundamental concepts from thermodynamics including temperature and heat, the ideal gas law, and the 1st and 2nd laws of thermodynamics.

Attendance/Participation: Class attendance helps with learning, and so you are expected to attend all lectures and recitations. Your grade will depend upon your attendance and class participation; this includes bringing a Wi-Fi device with REEF Polling access to lecture to answer in-class questions, and taking weekly written recitation quizzes.

Exams: There will be three 90-minute exams during the semester, to be given from 4:00 to 5:30 p.m. on Friday afternoons, and a comprehensive final exam, to be given from 4:00 to 6:00 p.m. on Monday, December 12. Exam questions will be based on lecture material, material contained in the text and in the homework assignments. For free-response problems, you must show all of your work on your exam paper for full credit. **There will be no makeup exams.**

Homework: All homework will be posted, collected, and graded via the internet. You will also be required to turn in written solutions to selected homework problems, which will be collected weekly and graded. You must access your assignment each week online through the Expert TA website, work the problems, and submit your solutions to the server by the due date indicated online. Your neatly written solutions to the homework problems requiring such must put in the mailbox labeled “1710 – Weathers” near the south end of the 2nd floor hallway in the Physics Building by the same due date and time as for the online homework. It is recommended that you make a copy of your written solutions before submitting them. Details of accessing the homework server are given on the 4th page of this syllabus. Address all problems with the homework server to your instructor.

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 percentages for each category are given below:

- **Exams:** 1st exam 15%; 2nd exam 15%; 3rd exam 15%; final exam 30%
- **Homework:** 15%
- **Lecture & Recitation:** 6% for lecture participation, 4% for recitation participation
- **Total:** 100%

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

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time, however, ODA notices of reasonable accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information see the Office of Disability Accommodation website at [http://www.unt.edu/oda](http://www.unt.edu/oda). You may also contact them by phone at 940.565.4323.

Note: This document is for informational purposes only and is subject to change upon notification.
Tentative Lecture Schedule – subject to amendment by the instructor

<table>
<thead>
<tr>
<th>Session</th>
<th>Date</th>
<th>Day</th>
<th>Chapter, Lecture Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30 Aug</td>
<td>T</td>
<td>Introduction; Ch. 1, Units, Physical Quantities</td>
</tr>
<tr>
<td></td>
<td>31 Aug</td>
<td>W</td>
<td>Recitations start</td>
</tr>
<tr>
<td>2</td>
<td>1 Sep</td>
<td>R</td>
<td>Ch. 1, Vectors</td>
</tr>
<tr>
<td>3</td>
<td>6 Sep</td>
<td>T</td>
<td>Ch. 2, Motion in One Dimension</td>
</tr>
<tr>
<td>4</td>
<td>8 Sep</td>
<td>R</td>
<td>Ch. 3, Motion in Two Dimensions</td>
</tr>
<tr>
<td>5</td>
<td>13 Sep</td>
<td>T</td>
<td>Ch. 3, Motion in Two and Three Dimensions</td>
</tr>
<tr>
<td>6</td>
<td>15 Sep</td>
<td>R</td>
<td>Ch. 3, Motion in Three Dimensions; Ch. 4, Newton’s Laws of Motion—1st Law</td>
</tr>
<tr>
<td>7</td>
<td>20 Sep</td>
<td>T</td>
<td>Ch. 4, Newton’s Laws of Motion—2nd and 3rd Laws</td>
</tr>
<tr>
<td>8</td>
<td>22 Sep</td>
<td>R</td>
<td>Ch. 5, Applications of Newton’s Laws</td>
</tr>
<tr>
<td>9</td>
<td>27 Sep</td>
<td>T</td>
<td>Ch. 5, Applications of Newton’s Laws continued</td>
</tr>
<tr>
<td>10</td>
<td>29 Sep</td>
<td>R</td>
<td>Ch. 5, Applications of Newton’s Laws continued</td>
</tr>
<tr>
<td>11</td>
<td>4 Oct</td>
<td>T</td>
<td>Ch. 6, Work and Kinetic Energy</td>
</tr>
<tr>
<td>12</td>
<td>6 Oct</td>
<td>R</td>
<td>Ch. 7, Potential Energy and Energy Conservation</td>
</tr>
<tr>
<td>13</td>
<td>11 Oct</td>
<td>T</td>
<td>Ch. 7, Applications of Energy Conservation</td>
</tr>
<tr>
<td>14</td>
<td>13 Oct</td>
<td>R</td>
<td>Ch. 8, Momentum and Impulse</td>
</tr>
<tr>
<td>15</td>
<td>18 Oct</td>
<td>T</td>
<td>Ch. 8, Collisions</td>
</tr>
<tr>
<td>16</td>
<td>20 Oct</td>
<td>R</td>
<td>Ch. 8, Center of Mass; Ch. 9, Rotation of Rigid Bodies</td>
</tr>
<tr>
<td>17</td>
<td>25 Oct</td>
<td>T</td>
<td>Ch. 9, Rotation of Rigid Bodies continued</td>
</tr>
<tr>
<td>18</td>
<td>27 Oct</td>
<td>R</td>
<td>Ch. 10, Dynamics of Rotational Motion</td>
</tr>
<tr>
<td>19</td>
<td>1 Nov</td>
<td>T</td>
<td>Ch. 10, Dynamics of Rotational Motion continued</td>
</tr>
<tr>
<td>20</td>
<td>3 Nov</td>
<td>R</td>
<td>Ch. 13, Gravitation</td>
</tr>
<tr>
<td>21</td>
<td>8 Nov</td>
<td>T</td>
<td>Ch. 13, Gravitation continued</td>
</tr>
<tr>
<td>22</td>
<td>10 Nov</td>
<td>R</td>
<td>Ch. 13, Gravitation continued; Ch. 14, Periodic Motion</td>
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<tr>
<td>23</td>
<td>15 Nov</td>
<td>T</td>
<td>Ch. 14, Periodic Motion continued</td>
</tr>
<tr>
<td>24</td>
<td>17 Nov</td>
<td>R</td>
<td>Ch. 15, Mechanical Waves</td>
</tr>
<tr>
<td>25</td>
<td>22 Nov</td>
<td>T</td>
<td>Ch. 15, Mechanical Waves continued</td>
</tr>
<tr>
<td></td>
<td>24 Nov</td>
<td>R</td>
<td>No class – Thanksgiving Holiday</td>
</tr>
<tr>
<td>26</td>
<td>29 Nov</td>
<td>T</td>
<td>Ch. 16, Sound and Hearing</td>
</tr>
<tr>
<td>27</td>
<td>1 Dec</td>
<td>R</td>
<td>Selected topics from Ch. 17: Temperature &amp; Heat; and Ch. 18: Thermal Properties of Matter</td>
</tr>
<tr>
<td>28</td>
<td>2 Dec</td>
<td>F</td>
<td>Exam 3—Ch. 9, 10, 13-15: 4:00PM to 5:30 PM, ART 223</td>
</tr>
<tr>
<td>29</td>
<td>8 Dec</td>
<td>R</td>
<td>Review for Exam</td>
</tr>
<tr>
<td>Final</td>
<td>12 Dec</td>
<td>M</td>
<td>FINAL EXAM —Comprehensive— 4:00PM to 6:00PM, TBD</td>
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Physics 1710 Core Objectives

This course satisfies the core course requirement by fostering skills associated with four core objectives:

1. **Critical thinking** - analysis, evaluation, and synthesis of information.
2. **Effective communication** - development, interpretation, and expression of ideas through written, oral, and graphical means.
3. **Quantitative skills** - the ability to compute and manipulate quantitative data and to reach meaningful conclusions.
4. **Teamwork** - the ability to consider different points of view and to work effectively as a team.

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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 for 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 to REEF Polling** 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. If you get stuck on a problem (for instance, after 3 unsuccessful attempts, or 20 minutes of effort), move on to the next problem and bring your questions to recitation, the Physics Instructional Center help room, or your instructor.

5. **Communicate with your instructor** via e-mail at weathers@unt.edu or during office hours whenever you have an observation or question.

6. **Come to class prepared:** bring a calculator, your textbook and, above all, your Wi-Fi device with REEF Polling in order to participate and take full advantage of the lecture hall learning experience.

7. **Work extra practice problems,** such as from the text’s end-of-chapter problems or posted on Blackboard.

To learn more about campus resources and information on how you can achieve success, go to succeed.unt.edu.

Classroom Participation

In this course we are using an electronic student response system. After you have set up your REEF student account on your smartphone or laptop, you will be able to respond to questions 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 in this way will you be credited with attending the lecture after the enrollment period. The motivation for using this technology is to provide 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 using your device keypad.

3. 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.

**To set up your free REEF student account:**

(a) Either download the iOS or Android app REEF Polling or open a browser and go to https://app.reef-education.com (choose “student sign up” in the top right corner)

(b) Create an account and use your UNT EUID (Blackboard login ID) as your student ID.

(c) Search for UNT. A list of all UNT courses will appear

(d) Search for this course: FL16 PHYS 1710.002 – Weathers

(e) Add the course

**To use REEF Polling in the lecture hall:**

(a) Bring your Wi-Fi device to class

(b) Open the REEF app or browser window, select this course, and JOIN. Connecting via Wi-Fi in the classroom is highly recommended. Make sure your device is configured so it doesn’t go to sleep during lecture, or you’ll have to rejoin.

**Note:** The misuse of REEF will be considered a violation of proper student conduct and will be treated as cheating. For this class, REEF is to be used as a learning tool **by you in the classroom.** Misuse would include submitting answers for a friend who is not in attendance in class, submitting answers when you are absent, having someone else submit answers for you when you are absent, or any other use of REEF by which you are not submitting your own work in class.

Homework Information

In this course you will be using Expert TA, an online tutorial and homework program.

**To get started:**

(a) Go to the registration link: https://www.theexpertta.com/registration

(b) Enter the 3-part Student Class Code: USQ45TX-2B749D-1GK

(c) Enter your email address (to be your user name), a password, and requested personal information

(d) Either use your access card from the bookstore, or pay using a credit card

You can now begin using Expert TA. You will be directed to the main class management screen and your class name will be in the left column under “Classes”. Assignments will be in the middle column listed under “Assignments” and are shown by due dates.

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date/time. Note, tutorial problems are available for practice throughout the semester in the “Student Practice Area”. These are unsaved assignments you can create yourself without the pressure of grade, and include some extra guidance.

There is a “Getting Started with Expert TA” Tutorial available, so you can get familiar with the interface. Hints and Feedback should be used often when available, as these are key features of the system.

Student & Tech Support – email main@theexpertta.com any time. You can also call 24x7 toll-free 877-572-0734. Student FAQs available by visiting http://theexpertta.com/support/support-faqs

To help you develop the skill of explaining problem solutions, you will also be required to submit written solutions to some of the assigned problems, which will be collected weekly and graded. Your neatly written solutions to these problems must be turned in to the mailbox labeled “1710 – Weathers” near the south end of the 2nd 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, and that you photocopy your work before handing it in. Be sure to staple all your work together and put your name and the assignment number 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. Homework problems and related problems will be discussed in recitation.

Homework grading policy:
(a) The Expert TA web-based homework score is up to 80% of the total score possible for an assignment.
(b) The remaining 20% of your assignment score is based on the quality of your written solutions. To receive full credit for the written work, the solutions presented must be both i) correct and ii) sufficiently detailed to allow someone to understand all the steps of the solution.

Ancillary Materials
Blackboard Learn will be used to post some useful course materials and your grades. To get to this resource, go to http://learn.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 PowerPoint presentations from lecture, extra problems with solutions for practice, copies of old exams with keys, the equation sheets for exams, and you will be able to access your exam and quiz grades.

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 end-of-chapter problems. These materials are on course reserve under PHYS 1710 in Willis Library, and may be checked out for 2-hour in-library use.

Tutors are available in Physics Room 209 Monday through Wednesday from 10 a.m. to 6 p.m., Thursday from 10 a.m. to 8 p.m., and Friday from 10 a.m. to 5 p.m., to assist you with questions related to solving homework problems.

Supplemental Instruction is also available for this course. Please check Blackboard for details.

Course Evaluation
The Student Perceptions of Teaching (SPOT) is a requirement for all organized classes at UNT. This short survey will be made available to you on-line at the end of the semester and will provide you with an opportunity to provide feedback to your course instructor. SPOT is considered to be an important part of your participation in this class. In addition to SPOT, there will be a brief in-class course survey during the last two weeks of the semester.

For the Fall 2016 semester you will receive an email on November 21st (12:01 a.m.) from "UNT SPOT Course Evaluations via IASystem Notification" (no-reply@iasystem.org) with the survey link. Please look for the email in your UNT email inbox. Simply click on the link and complete your survey.

After logging in to the my.unt.edu portal, students can access the SPOT survey site by clicking on the SPOT icon. A list of their currently enrolled courses will appear. Students complete each course evaluation independently. During the long terms, the SPOT is open for students to complete two weeks prior to final exams. During the summer terms, the SPOT is open for students to complete six days preceding their final exam. See SPOT Calendar for specific dates and deadlines.