Physics 221: Elements of Physics

University of Tennessee, Spring 2021

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<thead>
<tr>
<th>Instructor:</th>
<th>Dr. Tova Holmes</th>
<th>Time:</th>
<th>Tuesday 11:30 – 12:45</th>
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<tbody>
<tr>
<td>Email:</td>
<td><a href="mailto:tholmes@utk.edu">tholmes@utk.edu</a></td>
<td>Place:</td>
<td>Online</td>
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Course Page: https://utk.instructure.com/courses/119286

Teaching Assistants:

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  Section 11

Textbook:

- OpenStax College Physics, https://openstax.org/details/books/college-physics
- Supplemental practice problems: OpenStax Tutor, College Physics

Overview: This course covers basic physical principles and applications, and fulfills the first half of the physics requirement for pre-medical, pre-pharmacy and pre-veterinary programs. Topics include mechanics, heat, and wave motion.

Prerequisites: MATH 130 or MATH 131 or MATH 132 or MATH 125 or MATH 141 or MATH 151 or MATH 152. Any calculus course is also an appropriate prerequisite.

Structure:

Students meet once per week for one hour and 15 minutes online (Tuesdays, 11:30 - 12:45) and once per week, by section, in a studio physics classroom (Thursdays, and Fridays, room 207 Nielsen Physics Building). In order to reduce the number of students in the lab at one time, these sections will each be divided into two groups, which will use the room for half the allotted section time, with a brief cleaning period between groups. In keeping with University guidelines, masks and physical distancing will be required during these sessions. Additional laboratory and discussion assignments will take place online. There is also an online-only laboratory section, which meets asynchronously.

This course is designed to give students an opportunity to direct their own learning. Each week, you will be expected to read the course material before the Tuesday class. The full class meetings on Tuesday are not a formal lectures, but a discussion of concepts that students are expected to learn outside of class. You will practice concepts by solving problems, and responses will be recorded as part of the participation component of the course. After each full class meeting, you will complete an online pre-lab assignment.
The studio sessions are a combination of a laboratory and discussion section. Students will perform experiments, and session instructors will guide students to further explore the physics concepts introduced in the reading assignments and gain an understanding of how these concepts apply to a wide range of real world problems and situations. After each studio session, you’ll submit a laboratory report.

Students will be graded on a combination of homework, pre-lab assignments, lab reports, participation, and midterm and final scores. In order to pass, students must have at least 60% on their lab reports.

**Tentative Course Outline:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Chapter(s)</th>
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<tbody>
<tr>
<td>Jan. 26</td>
<td>Position, Velocity, and Acceleration</td>
<td>Ch. 2</td>
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<tr>
<td>Feb. 2</td>
<td>Newton’s Laws of Motion</td>
<td>Ch. 4</td>
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<tr>
<td>Feb. 9</td>
<td>Applications of Newton’s Laws of Motion</td>
<td>Ch. 3,5</td>
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<td>Feb. 16</td>
<td>Work and Energy</td>
<td>Ch. 7</td>
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<td>Feb. 23</td>
<td>Momentum</td>
<td>Ch. 8</td>
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<td>Mar. 2</td>
<td>Rotational Motion</td>
<td>Ch. 9,10</td>
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<tr>
<td>Mar. 9</td>
<td>Review</td>
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<td>Mar. 16</td>
<td>Static Fluids</td>
<td>Ch. 11</td>
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<td>Mar. 23</td>
<td>Fluid Dynamics</td>
<td>Ch. 12</td>
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<tr>
<td>Mar. 30</td>
<td>Temperature and Heat</td>
<td>Ch. 13,14</td>
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<td>Apr. 6</td>
<td>Thermodynamics</td>
<td>Ch. 15</td>
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<td>Apr. 13</td>
<td>Mechanical Waves</td>
<td>Ch. 16</td>
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<td>Apr. 20</td>
<td>Sound</td>
<td>Ch. 17</td>
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<td>Apr. 27</td>
<td>Overflow/Review</td>
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**Grading Policy:** Homework and pre-lab assignments (25%), lab reports (20%), tests (35%), class participation (20%). Class participation beyond what is required will earn you extra credit. You have three attempts at each assignment, and the best score will be taken.

**Tentative Exam Dates:**

- Midterm: March 11-12, 2021
- Final Exam: May 3, 2021

**Course Policies:**

- **Code of Conduct:** This class welcomes people with many different experiences and backgrounds, all of whom should feel comfortable participating in group work and discussion. Questions should be asked and answered respectfully. No forms of harassment, including any form of abuse or exclusionary jokes, will be tolerated in the classroom or in any online forums.

- **Academic Integrity:** Please do not cheat. If you find yourself struggling with material, please reach out to me or your TA, and we’ll be more than happy to help. It’s why we’re here.

- **Missed homework, exams, etc:** Contact the Office of the Dean of Students if you have extenuating circumstances, and fill out an absence notification. Otherwise, no late work is accepted.

- **Grading scale:** This course is graded with the standard grading scale in which scores in the 90s result in an A, scores in the 80s result in a B, etc.

If you need course adaptations or accommodations because of a documented disability, please contact Student Disability Services (SDS). This will ensure that you are properly registered for the services provided by SDS.