Phys 211 (Section 5)

Physics for Science and Engineering I
Mon, Wed, Fri, 9:00-9:50am, Rm 101 Lewis Hall

Dr. Nicholas R. MacDonald

email: nmacdona@olemiss.edu
website: https://physics.olemiss.edu/macdonald/
office location: Rm 126 Lewis Hall
office hours: Mon, Wed, Fri, 10:00-11:00am or by appointment
office phone: (662) 915-5252

The syllabus may evolve dynamically depending on class progress.

Course Description: This is a three credit-hour, calculus-based physics course which covers basic mechanics. In this course, we will use the fundamental laws of physics to describe a wide range of natural phenomena (from ripples on a pond to galaxies). Topics to be covered include motion, forces, momentum, and energy.

Course Corequisites: Math 262 OR (Math 261 and Physics 201), Physics 221

Text(s): University Physics Volume 1
Author(s): OpenStax; ISBN: 1-938168-27-5; This is an open source textbook from OpenStax at Rice University. It is available for free online in a variety of formats, including html, pdf, Apple iBooks, and Amazon Kindle (see this URL). If you prefer, you can also purchase a print version via OpenStax on Amazon.com.

Course Objectives:
At the completion of this course, students will have:

1. Skills to mathematically (and conceptually) apply Newtonian mechanics including kinematics, Newton’s Laws, conservation of energy, linear and angular momentum, and rotational mechanics.
2. An understanding of basic fluid dynamics, gravitation, and wave mechanics.
3. Experience in developing critical thinking skills and the application of these skills to solving problems mathematically.

Grade Distribution:

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance</td>
<td>10%</td>
</tr>
<tr>
<td>Assignments</td>
<td>30%</td>
</tr>
<tr>
<td>Summative Quizzes</td>
<td>36%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>24%</td>
</tr>
</tbody>
</table>
Course Policies:

• General
  – Computers are not to be used unless for note taking.
  – The midterm and final exams are closed book, closed notes.

• Grades
  – Grades will be maintained in Blackboard Learn (https://blackboard.olemiss.edu/) and students are responsible for tracking their own progress.
  – Grading Scale:
    \[
    \begin{align*}
    92\% & \leq A \leq 100\% \\
    88\% & \leq A- \leq 92\% \\
    84\% & \leq B+ \leq 88\% \\
    80\% & \leq B \leq 84\% \\
    76\% & \leq B- \leq 80\% \\
    72\% & \leq C+ \leq 76\% \\
    68\% & \leq C \leq 72\% \\
    64\% & \leq C- \leq 68\% \\
    60\% & \leq D \leq 64\% \\
    F & \leq 60\%
    \end{align*}
    \]

• Expectations
  – Students should expect to spend about 8 hours per week reading, doing homework, and preparing for class in order to do well.
  – Study the textbook regularly. Class discussion will not cover all of the material, but students will have the opportunity to ask questions about any aspect of the text.
  – Complete the WebAssign questions after reading. It will take longer to complete the WebAssign homework if the textbook reading assignments are not completed first.
  – Homework sets will be assigned using the WebAssign online homework system that can be accessed through Blackboard. It is very important to start early and finish homework on time. There is a 25% penalty for each online submission beyond the first three attempts for each question. To avoid this penalty, students should work out each problem carefully on paper before submitting solutions. This will also be very helpful when studying for tests.
  – As scientists and engineers normally work in groups, students are encouraged to work together on homework to teach and learn from each other. However, each student is responsible for understanding all details of a problem solution.
  – Students may be required to turn in written homework solutions for grading. This will be done through Blackboard. Students should use good problem-solving strategies (which will be demonstrated in class).
• Attendance and Absences
  – Attendance is mandatory and will be taken each class (Ole Miss ID card system).
  – Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee’s responsibility to get all missing notes or materials.

• Important Dates
  – See the academic calendar (http://registrar.olemiss.edu/fall-2023). Summative quiz dates are tentative and subject to change. The final exam date is fixed and cannot be changed.
  – Summative Quiz 1: Thursday, September 21st, 5:30-7:00 pm
  – Summative Quiz 2: Thursday, October 19th, 5:30-7:00 pm
  – Summative Quiz 3: Thursday, November 16th, 5:30-7:00 pm
  – Final Exam: Monday, December 6th, 8:00-11:00 am

• Academic Integrity
  – Every student of the University of Mississippi, by virtue of choosing to be part of the university community agrees to abide by the University of Mississippi Creed and the UM Academic Integrity Policy which covers academic integrity. Please consult the M-Book, Academic Integrity document for details on university policy and the academic creed.
  – Cheating is forbidden and will result in a zero grade on the assignment. If a second case of cheating occurs, this will result in an F for the entire course.
  – UM Creed The University of Mississippi is a community of learning dedicated to nurturing excellence in intellectual inquiry and personal character in an open and diverse environment. As a voluntary member of this community:
    * I believe in respect for the dignity of each person
    * I believe in fairness and civility
    * I believe in personal and professional integrity
    * I believe in academic honesty
    * I believe in academic freedom
    * I believe in good stewardship of our resources
    * I pledge to uphold these values and encourage others to follow my example
  – All materials distributed electronically and in hard copy in this class are protected under intellectual copyright. Any attempt to upload these documents onto the Internet (or to distribute them by some other means) or to profit from the distribution (by Internet or other means) of these documents constitutes theft and will be in violation of intellectual property law and the UM Academic Conduct Code unless expressly permitted for by the instructor. Accessing such materials for your own use is also in violation of the UM Academic Conduct Code.

• Audio and video recording:
  – Audio and/or video recording of class lectures is not allowed unless explicit permission is given by the instructor. Permission will only be given if the student has a Student Disability Services request. In such cases, recordings may only be used by the student to whom permission is given and all recordings must be deleted at the end of the semester. Recordings may not be distributed online or elsewhere.
• Disability Access and Inclusion:

  - The University of Mississippi is committed to the creation of inclusive learning environments for all students. If there are aspects of the instruction or design of this course that result in barriers to your full inclusion and participation, or to accurate assessment of your achievement, please contact the course instructor as soon as possible. Barriers may include, but are not necessarily limited to, timed exams and in-class assignments, difficulty with the acquisition of lecture content, inaccessible web content, and the use of non-captioned or non-transcribed video and audio files. If you are registered with SDS, you must log in to your Rebel Access portal at https://sds.olemiss.edu/rebel-access-portal to request approved accommodations. If you are NOT registered with SDS, you must complete the process to become registered. To begin that process, please visit our website at https://sds.olemiss.edu/apply-for-services. SDS will: 1. Complete a comprehensive review to determine your eligibility for accommodations, 2. If approved, disseminate to your instructors a Faculty Notification Letter, 3. Facilitate the removal of barriers, and, 4. Ensure you have equal access to the same opportunities for success that are available to all students. If you have questions, contact SDS at 662-915-7128 or sds@olemiss.edu.

Teaching Assistant:

I am pleased to welcome Devesh Bhattarai to the course. He will be running class discussion sessions and will assist with the grading. The class discussion sessions will take place in Lamar 327 on Thr 5:30-7:00pm. You can contact Devesh at: dbhatta1@go.olemiss.edu

Other Required Items:

• Online homework and classroom activity system: Webassign. The system can be accessed through Blackboard (blackboard.olemiss.edu). Students must purchase access to Webassign for this class.

• Scientific calculator. Any calculator with trigonometric functions, exponential functions, and scientific notation.
<table>
<thead>
<tr>
<th>Week</th>
<th>Content</th>
</tr>
</thead>
</table>
| Week 1 | • Aug.21 - Lecture 1 - Chapter 1: Units and Measurement (1.1-1.7)  
• Aug.23 - Lecture 2 - Chapter 2: Vectors (2.1-2.2)  
• Aug.25 - Lecture 3 - Chapter 2: Vectors (2.3-2.4) |
| Week 2 | • Aug.28 - Lecture 4 - Chapter 3: Motion Along a Straight Line (3.1-3.3)  
• Aug.30 - Lecture 5 - Chapter 3: Motion Along a Straight Line (3.4-3.6)  
• Sept.1 - Lecture 6 - Chapter 4: Motion in Two and Three Dimensions (4.1-4.3) |
| Week 3 | • Sept.4 - Labor Day  
• Sept.6 - Lecture 7 - Chapter 4: Motion in Two and Three Dimensions (4.4-4.5)  
• Sept.8 - Lecture 8 - Chapter 5: Newton’s Laws of Motion (5.1-5.3) |
| Week 4 | • Sept.11 - Lecture 9 - Chapter 5: Newton’s Laws of Motion (5.4-5.6)  
• Sept.13 - Lecture 10 - Chapter 5: Newton’s Laws of Motion (5.7)  
• Sept.15 - Lecture 11 - Chapter 6: Applications of Newton’s Laws (6.1-6.2) |
| Week 5 | • Sept.18 - Lecture 12 - Chapter 6: Applications of Newton’s Laws (6.3-6.4)  
• Sept.20 - Lecture 13 - Chapter 7: Work and Kinetic Energy (7.1-7.2)  
• Sept.22 - Lecture 14 - Chapter 7: Work and Kinetic Energy (7.3-7.4) |
| Week 6 | • Sept.25 - Lecture 15 - Chapter 8: Pot. Energy and Cons. of Energy (8.1-8.2)  
• Sept.27 - Lecture 16 - Chapter 8: Pot. Energy and Cons. of Energy (8.3)  
• Sept.29 - Lecture 17 - Chapter 8: Pot. Energy and Cons. of Energy (8.4-8.5) |
| Week 7 | • Oct.2 - Lecture 18 - Chapter 9: Linear Momentum and Collisions (9.1-9.3)  
• Oct.4 - Lecture 19 - Chapter 9: Linear Momentum and Collisions (9.4-9.5)  
• Oct.6 - Lecture 20 - Chapter 9: Linear Momentum and Collisions (9.6-9.7) |
| Week 8 | • Oct.9 - Lecture 21 - Chapter 10: Fixed-Axis Rotation (10.1-10.3)  
• Oct.11 - Lecture 22 - Chapter 10: Fixed-Axis Rotation (10.4-10.6)  
• Oct.13 - Lecture 23 - Chapter 10: Fixed-Axis Rotation (10.7-10.8) |
| Week 9 | • Oct.16 - Lecture 24 - Chapter 11: Angular Momentum (11.1-11.2)  
• Oct.18 - Lecture 25 - Chapter 11: Angular Momentum (11.3-11.4)  
• Oct.20 - Lecture 26 - Chapter 12: Static Equilib. and Elasticity (12.1-12.2) |
| Week 10 | • Oct.23 - Lecture 27 - Chapter 12: Static Equilib. and Elasticity (12.3-12.4)  
• Oct.27 - Lecture 29 - Chapter 13: Gravitation (13.3-13.4) |
| Week 11 | • Oct.30 - Lecture 30 - Chapter 14: Fluid Mechanics (14.1-14.2)  
• Nov.1 - Lecture 31 - Chapter 14: Fluid Mechanics (14.3-14.4)  
• Nov.3 - Lecture 32 - Chapter 14: Fluid Mechanics (14.5-14.6) |
| Week 12 | • Nov.6 - Lecture 33 - Chapter 15: Oscillations (15.1-15.2)  
• Nov.8 - Lecture 34 - Chapter 15: Oscillations (15.3-15.4)  
• Nov.10 - Lecture 35 - Chapter 15: Oscillations (15.5-15.6) |
| Week 13 | • Nov.13 - Lecture 36 - Chapter 16: Waves (16.1-16.2)  
• Nov.15 - Lecture 37 - Chapter 16: Waves (16.4-16.6)  
• Nov.17 - Lecture 38 - Chapter 17: Sound (17.1-17.2) |
| Week 14 | • Nov.20 - Thanksgiving Break  
• Nov.22 - Thanksgiving Break  
• Nov.24 - Thanksgiving Break |
| Week 15 | • Nov.27 - Lecture 39 - Chapter 17: Sound (17.3-17.4)  
• Nov.29 - Lecture 40 - Chapter 17: Sound (17.5-17.8)  
• Dec.1 - Lecture 41 - Class Review |