Instructor: Dr. Zohreh Hashami
E-mail: zohreh@dcccd.edu
Office Hours: By appointment

Division Office: 972-860-4750
Chaz Hafey: 972-860-4766

Lecture: MTWRF 5:40-7:40 p.m. Room K-254
Lab: MTWRF 7:50-9:50 p.m. Room K-251

Catalog Description
This is a Texas Common Course Number. This is a Core Curriculum course selected by the colleges of DCCCD.
Prerequisite: MATH 2413, DREA 0093 or English as a Second Language (ESOL) 0044 or have met the Texas Success Initiative (TSI) standard in Reading.
Course Description: The first semester of calculus-based physics sequence for science, computer science, and engineering majors. The principles and applications of classical mechanics, including harmonic motion, physical systems and thermodynamics are studied with emphasis on problem solving. Performance of basic laboratory experiments supporting theoretical physics principles and applications of classical mechanics, including harmonic motion, physical systems and thermodynamics. Also includes experimental design, data collection and analysis, and preparation of laboratory reports. (3 Lec., 3 Lab.)

Coordinating Board Academic Approval Number 4008015303

Student Learning Outcomes
1. State the principles and laws of physics as they apply to mechanics, harmonic motion and thermodynamics.
2. Identify and use relevant equations applicable to mechanics, harmonic motion and thermodynamics.
3. Apply the concepts learned to solve theoretical problems and explain phenomena in the laboratory and in the outside world.
4. Perform laboratory experiments that illustrate important concepts and analyze the data gathered using scientific principles.
5. Develop skills for analytical thinking that are useful for problem solving in physics and other fields.
6. Participate in enrichment activities that lead to an appreciation of how physics has developed, how physics affects other fields and the relevance of learning physics.

Learning Outcomes from THECB
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 the 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.
13. Solve problems involving the First and Second Laws of Thermodynamics.
14. Prepare laboratory reports that clearly communicate experimental information in a logical and scientific manner.
15. Conduct basic laboratory experiments involving classical mechanics.
16. Relate physical observations and measurements involving classical mechanics to theoretical principles.
17. Evaluate the accuracy of physical measurements and the potential source of error in the measurements.
18. Design fundamental experiments involving principles of classical mechanics.
19. Identify appropriate sources of information for conducting laboratory experiments involving classical mechanics.

Core Objectives
PHYS 2425 is part of the Life and Physical Sciences Component Area 030.

(i) Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method.
(ii) Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.
(iii) The following four Core Objectives are addressed in this course to fulfill this requirement:
   • **Critical Thinking Skills:** to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.
   • **Communication Skills:** to include effective development, interpretation and expression of ideas through written and visual communication.
   • **Empirical and Quantitative Skills:** to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.
   • **Teamwork:** to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.

Textbook
Optional: *Student Solutions Manual for Katz’s Physics for Scientists and Engineers, Volume 1*.

Course Outline
The course is divided into four units. See the Course Calendar on page 4 for topics included in each unit. The schedule containing the objectives, dates on which they will be covered, related reading, problems and assignments is distributed separately.

Evaluation
Tests: There will be four tests during the semester. Tests will consist of conceptual questions and problems. Students must follow the Brookhaven College code of student conduct at all times during the course, and dishonesty will not be tolerated.
Lab experiments & Reports: There will be 10 experiments during the semester, each worth 30 points. The labs are listed on page 4. Making accurate measurements and recording and analyzing data will be required for the lab report. The format to be followed is discussed in the lab manual and during lab. Lab reports will be due as scheduled and late reports will not be accepted without permission.

Assignments: The schedule will contain assigned problems, questions and activities from the textbook which will be due as scheduled. There may also be open-book problem-sessions in lab which may be graded. Solving problems with understanding and confidence plays a vital role in Physics. Please plan to spend lots of time on problem-solving as it is vital to your success.

The final grade will be calculated as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>4 tests</td>
<td>400</td>
</tr>
<tr>
<td>Lab reports</td>
<td>300</td>
</tr>
<tr>
<td>Assignments &amp; attendance</td>
<td>200</td>
</tr>
<tr>
<td>Total</td>
<td>900</td>
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Divide the total by 9 to obtain your final grade.

A = 90 to 100  
B = 80 to 89  
C = 70 to 79  
D = 60 to 69  
F = Below 60

Incomplete grades are given only when an unforeseen emergency prevents a student from completing the course work. Division chairs must approve all "I" grades.

CLASS POLICIES (on-campus classes)

All Policies can be accessed at the following link, but for your convenience they are summarized below: https://www.Brookhavencollege.edu/syllabusaddendum

1. **The deadline for withdrawal is June 25(T), 2019.** If you are unable to complete the course, it is your responsibility to withdraw, by filling in the appropriate forms. Failure to do so will result in a performance grade which may be an F.

2. You cannot drop more than 6 courses during your entire undergraduate career unless it qualifies as an exemption.

3. Failure to attend classes could result in a loss of financial aid. Please check with the Financial Aid Office prior to withdrawing.

4. All students must be certified. For on-campus courses it means you must attend at least one class before the certification date.

5. Students on F-1 visas cannot withdraw without permission of the International Student Advisor.

6. If you will be absent due to a religious holiday, let the instructor know at the beginning of the semester so alternate arrangements can be made.

7. If you need assistance due to a disability, you are responsible for notifying the Disability Services Office in Room S-136 so they can assist you.

8. DCCCD Colleges will charge additional tuition for students who register for a third or subsequent time for a course.
9. Code of Student Conduct – Your registration in this course implies your acceptance of the DCCCD Code of Student Conduct. As a college student you are considered a responsible adult and no form of scholastic dishonesty will be tolerated. Scholastic dishonesty includes but is not limited to cheating on a test, plagiarism and collusion.

10. Students may access their grades during the semester on eCampus and their final letter grade on eConnect.

11. The Family Educational Rights and Privacy Act (FERPA) gives students certain rights with respect to their educational records. See complete statement at the link above.

12. DCCCD policy prohibits harassment, discrimination and sexual misconduct.

13. The instructor reserves the right to add, delete or revise the syllabus.

Special Help
Please come and see me during my office hours if you need help during the semester. You can also schedule a meeting at other times. Mr. Chaz Hafey is available for assistance with problem-solving during tutoring/open lab hours. His hours are posted in lab K-251. Tutoring is also available in K-255 during posted hours.

### COURSE CALENDAR

<table>
<thead>
<tr>
<th>UNIT 1</th>
<th>June 6-11</th>
<th>Introduction, Kinematics, Vectors 2 Dimensional Motion Test 1</th>
<th>Chapters 1, 2, 3, 4</th>
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<tbody>
<tr>
<td></td>
<td>June 12</td>
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<tr>
<td>UNIT 2</td>
<td>June 13-18</td>
<td>Newton’s Laws &amp; Work, Energy Test 2</td>
<td>Chapters 5, 6, 8, 9</td>
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<td>June 19</td>
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<tr>
<td>UNIT 3</td>
<td>June 20-27</td>
<td>Momentum, Gravitation &amp; Rotational Motion Test 3</td>
<td>Chapters 10, 11, 7, 12, 13</td>
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<td>June 26</td>
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<tr>
<td>UNIT 4</td>
<td>June 27-July 2</td>
<td>Harmonic Motion, Waves, Thermodynamics Test 4</td>
<td>Chapters 16, 17, 18, Chapters 19, 21</td>
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<td></td>
<td>July 3</td>
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### LAB SCHEDULE

<table>
<thead>
<tr>
<th>June 6</th>
<th>Lab Introduction</th>
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<tbody>
<tr>
<td>June 7</td>
<td>Acceleration on an Inclined Plane (Lab 1)</td>
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<tr>
<td>June 10</td>
<td>Velocity &amp; Acceleration (Lab 2)</td>
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<tr>
<td>June 13</td>
<td>Force Table (Lab 3)</td>
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<td>June 14</td>
<td>Projectile Motion (Lab 4)</td>
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<td>June 17</td>
<td>Friction (Lab 8)</td>
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<td>June 20</td>
<td>Interconversions of Energy (Lab 9)</td>
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<td>June 24</td>
<td>Conservation of Momentum (Lab 10)</td>
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<tr>
<td>June 27</td>
<td>Torques and equilibrium (Lab 7)</td>
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<td>June 28</td>
<td>Centripetal Force (Lab 12)</td>
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<tr>
<td>July 1</td>
<td>Standing Waves in Strings (Lab 14)</td>
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