PHYS 1401-81501 Syllabus
Dallas College – Richland Campus
4 credit hours

1. Course Information
Course Number/Section: PHYS 1401-81501
Course Title: College Physics I
Term: Fall 2020
Class meeting Time/Location: online via eCampus & Microsoft Teams
Certification Date: Saturday, September 5, 2020
Last Day to Withdraw: Thursday, November 12, 2020

2. Instructor Contact Information
Instructor: Dawit Werdofa
E-mail: dawitwerdofa@dcccd.edu

3. Course Description
The first semester of an algebra and trigonometry-based fundamentals of physics sequence. The principles and applications of classical mechanics and thermodynamics, including harmonic motion, mechanical waves and sound, physical systems, Newton’s Laws of Motion, and gravitation and other fundamental forces are studied with emphasis on problem solving. Laboratory experiments supporting the topics are included. (3 Lec., 3 Lab.)

4. Course Prerequisites
MATH 1314, and either MATH 1316 or MATH 2312

5. Student Learning Objectives
1. Determine the components of linear motion (displacement, velocity, and acceleration), and especially motion under conditions of constant acceleration.
2. Apply Newton’s laws to physical problems including gravity.
3. Solve problems using principles of energy.
4. Use principles of impulse and linear momentum to solve problems.
5. Solve problems in rotational kinematics and dynamics, including the determination of the location of the center of mass and center of rotation for rigid bodies in motion.
6. Solve problems involving rotational and linear motion.
7. Describe the components of a wave and relate those components to mechanical vibrations, sound, and decibel level.
8. Demonstrate an understanding of equilibrium, including the different types of equilibrium.
9. Discuss simple harmonic motion and its application to quantitative problems or qualitative questions.
10. Solve problems using the principles of heat and thermodynamics.
11. Solve basic fluid mechanics problems.

6. **Texas Core Objectives**

The College defines essential knowledge and skills that students need to develop during their college experience. These general education competencies parallel the Texas Core Objectives for Student Learning. In this course, the activities you engage in will give you the opportunity to practice two or more of the following core competencies:

1. **Critical Thinking Skills** - to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.

2. **Communication Skills** - to include effective development, interpretation, and expression of ideas through written, oral, and visual communication.

3. **Empirical and Quantitative Skills** - to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.

4. **Teamwork** - to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.

5. **Personal Responsibility** - to include the ability to connect choices, actions, and consequences to ethical decision-making.

6. **Social Responsibility** - to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities.

7. **Required Textbooks and Materials**

   **Lecture Textbook**
   
   This course uses a FREE innovative textbook developed by OpenStax College. The textbook is available at the following link in a variety of convenient digital formats for which a paper copy can also be printed.

   [http://openstaxcollege.org/textbooks/college-physics/get](http://openstaxcollege.org/textbooks/college-physics/get)

   **Lab Textbook**

   Lab manual on eCampus (free, but you are responsible to print and bring appropriate Pages)

8. **Tentative Schedule**

<table>
<thead>
<tr>
<th>Course outline</th>
<th>The relevant chapters will be covered in order. Test dates will be determined according to class progress.</th>
</tr>
</thead>
</table>
   | **Lecture Calendar** | 1) Ch 1- The Nature of Science and Physics  
2) Ch 2- One-Dimensional kinematics  
3) Ch 3- Two-Dimensional Kinematics  
4) Ch 4- Dynamics: Newton’s Laws of motion  
5) Ch 5- Further Applications of Newton’s Laws: Friction, Drag and elasticity  
6) Ch 6- Uniform Circular Motion and Gravitation  
7) Ch 7- Work, Energy, and Energy Resources  
8) Ch 8- Linear Momentum and Collisions  
9) Midterm Exam or Unite Exams |
10) Ch 9 - Statics and Torque
11) Ch 10 - Rotational Motion and Angular Momentum
12) Ch 11 - Fluid Statics
13) Ch 12 - Fluid Dynamics and Its Biological and Medical Applications
14) Ch 13 - Temperature, Kinetic theory, and the Gas Laws
15) Ch 14 - Heat and Heat Transfer Methods
16) Ch 15 - Thermodynamics
17) Ch 16 - Oscillatory Motion and Waves
18) Final Exam

The material and dates presented in this syllabus can be changed at instructor’s discretion.

9. Assessment
Final grades are determined from a combination of the items below.

<table>
<thead>
<tr>
<th>Attendance &amp; Daily Grades</th>
<th>10%</th>
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</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>10%</td>
</tr>
<tr>
<td>Lab reports</td>
<td>20%</td>
</tr>
<tr>
<td>Midterm Exam (Average Unit Exam)</td>
<td>30%</td>
</tr>
<tr>
<td>Comprehensive Final Exam</td>
<td>30%</td>
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</tbody>
</table>

10. Grading explanation
A (90-100%), B (80-89%), C (70-79%), D (60-69%) and F (<59%)

11. Attendance, Quizzes and Exams
Students are expected to attend all lecture and Exams.
Class begins and ends 08/24/20 to 12/10/20

12. Resources for student success
In addition to lectures and labs, the following resources are available for the student success during this course:
-Textbook: the lectures will follow closely the order, material, and notation used in the textbook.

13. Lab and Lab Reports
Each lab will consist of a virtual experiment and a submitted, written/typed lab report, which is due at the end of day (11:59 p.m.) each Friday. The report must include a completed cover sheet, and pre-lab work completed, and the lab results with math work shown and questions answered.

14. Late Work Policy:
Late work will only be accepted on rare occasion, with permission, and will not be accepted once it has been graded and returned to the rest of class.

15. Lab Schedule
The student will download the virtual lab document, do the virtual lab activity, and submit through a lab dropbox that will be created for this purpose.
<table>
<thead>
<tr>
<th>Availability Dates</th>
<th>Experiment Number/manual</th>
<th>Lab Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/01</td>
<td>1</td>
<td><strong>Lab 1: Measurements</strong></td>
</tr>
<tr>
<td>09/08</td>
<td>2</td>
<td><strong>Lab 2: Linear Motion</strong></td>
</tr>
<tr>
<td>09/15</td>
<td>3</td>
<td><strong>Lab 3: Forces</strong></td>
</tr>
<tr>
<td>09/22</td>
<td>4</td>
<td><strong>Lab 4: Newton's 2nd Law</strong></td>
</tr>
<tr>
<td>09/29</td>
<td>5</td>
<td><strong>Lab 5: Friction</strong></td>
</tr>
<tr>
<td>10/06</td>
<td>6</td>
<td><strong>Lab 6: Centripetal Acceleration</strong></td>
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There are two more labs that will be added in the future on ecampus.

Note: The guidelines and days in this syllabus are subject to change, deletion, or amendment at the discretion of the instructor.