AP Physics 2

My Contacts:       Remind:
Joshua R. Dalrymple  Text @6644k8 to 81010
Room # TU 200
Email – joshua.dalrymple@saisd.org
Tutorial/Office Hours: TWRF 7:40-8:10, 1:06-1:33, 4:00-4:30

A quick Note:
I am not going to go in depth about AP Physics, what it stands for, what it covers, and so on. Throughout the year I will give you all the information you will need for this class and the test, and I do not what to overwhelm you just yet. We will take practice tests throughout the year, and I base my tests on the AP test to prepare you for the pacing and style of that exam. This is the last I will mention the test for a while so we can focus on physics and getting the year underway. If you wish to get more information on this test you can always go to this site: www.apcentral.collegeboard.com

AP Physics 2 is a tough class. This is not just any physics class. It involves more mathematical insight and more conceptual understanding than other physics classes, and it covers a great deal of content before the AP exam in May. This means that your level of responsibility in this class may be greater than in your other classes here at Central. I expect for you to be here every day, but there is no hand holding. If you miss a lecture or a lab you are responsible for getting the info you missed, I will not track you down.

I am not trying to scare you here but to prepare you for a tough, but fun and informative, year. I love the area of physics and I am very excited to share it with you. Stay positive, ASK QUESTIONS, and have fun. My goal is for all of you to leave this class with a good understanding of physics, but more importantly, an understanding of study skills, learning methods, and problem solving.

My Policies:

I. What you need- (all supplies must be ready by Monday, August 26)

<table>
<thead>
<tr>
<th>Supply</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composition Notebook</td>
<td>Notebook paper</td>
</tr>
<tr>
<td>Graph Paper</td>
<td>Calculator (Graphing is best)</td>
</tr>
<tr>
<td>Pencil every day</td>
<td>Colored pencils or fine tip markers for notetaking</td>
</tr>
</tbody>
</table>

Additional Supplies I am requesting for the classroom use:
- paper towels, Kleenex, sanitizing wipes, hand sanitizer.

This list is optional but appreciated 🙃

II. Classroom responsibilities-

a. In your seats when the bell rings!!
b. Cell phones stored inside bag during class, unless instructed otherwise
c. No food or drink in the lab
d. Participate in group discussion over problems.
e. Actively participate during labs in the groups
f. Turn in work on time
g. Be respectful to your classmates, the room and the teacher
h. Use class time for physics, do not work on other classes work during the period
III. Your responsibilities outside of class-
   a. Do the assigned work and be prepared for class
   b. Ask your classmates for help when you are stuck (forming a work/study group is highly recommended)
   c. Read your notes. Make notes on your notes.
   d. Get extra help from me both in and out of class (see my tutorial schedule)
   e. Do the outside of class reading

IV. Grading policy-

Tests – 40%
Labs – 30%
Quizzes – 20%
Homework – 10%

I will grade tests and quiz’s the way the AP graders will grade. I will be tough, but it important to see what you have missed and to do test corrections. You will receive extra credit on the test for completing test corrections. The test corrections must be completed outside of class time during tutorials, and they must be completed while in my classroom (you cannot take them home). The corrections provide for remediation and reteaching and must be thorough to receive extra credit. The amount of extra credit is based on the difficulty of the test and on what your score is. Test corrections are worth it for anyone and are available no matter what grade you made. As for your homework, labs, and quizzes, there will be no extra credit for corrections.

V. Homework and Quizzes-

You will be assigned readings and homework for every unit. There is an online homework program called Mastering Physics that you will be required to use. If you do not have internet at home, you may use the computers at the school, in my classroom, or at the public library outside of class time.

You will be given quizzes covering the assigned readings and homework. It is your responsibility to know how to do the homework problems so that you are prepared for the quizzes. If you are struggling with a particular assignment, you are the only one who can take the necessary steps to correct the situation: ask questions, work with classmates, and/or attend tutorials!

VI. Notes-

The composition notebook in the supply list will be your lab notebook. Your notebooks are yours. I may take them and grade them. I do stress to take good clean notes using colored pencils whenever possible. If you keep lecture notes, reference materials, and your work organized, you will find it very valuable when studying for class tests and for the AP exam.

VII. Tests-

There will probably be at least one, maybe two quizzes on each unit and one test. The quizzes will be short while the tests will look at your in-depth level of understanding. I will be creating these fun events in the same fashion as the real AP exam. My goal is to get you used to the exam format, style of questions, pacing etc. so that way you feel more comfortable when the real exam is in front of you.

VIII. Remind App-

I will use Remind in order to make class announcement, remind about due dates and communicate with the students. In order to join remind, please text @6644k8 to 81010
IX. Tardy Policy
Out of respect for me and your peers/lab partners be on time. Excessive tardies will result in a disciplinary measure.

X. Classroom Policies-
This is a college class, so I will try and run it that way.

a. Restrooms- Go when you have to, do not ask; you’re old enough now. Take the pass with you.
b. Talking- When anyone is asking questions of or presenting to the class as a whole, you are to be quiet. During labs and other collaborative activities, have fun and talk all you want.
c. Food and Drinks- No food or drink in the labs. If you make a mess clean it up.
d. Clean Room- You class is not the only one that uses this room, and our Janitorial staff has better things to do then clean my classroom. Thus, if the room is messy and the bell is about to ring, clean it up! I will hold the whole class, regardless, until my room is clean.
e. The classrooms materials- they are there for you to use so use them.
f. Questions- Ask many and often, without the whole “raise your hand” bit. You’re adults, find the right time and blurt your questions out.
g. Cheating- Please refer to the academic dishonesty statement.
h. The bell- When it rings at the beginning of class, you need to be in your seats and ready to go. When it rings at the end of class you must make sure that your workspace is clean before leaving.
i. Late work- If you missed turning something in because you were absent and it was excused then your work is not late. However, it you do not turn in your work because of an unexcused absence, a bad memory or whatever, you will receive no credit. Also, if you know you are going to miss a test, quiz, or lab, you must tell me and do it BEFORE you leave. I will not track you down and tell you or remind you that you missed something; that is your responsibility. ALL missing work must be made up before the unit test that covers this work.
j. Cell Phones – While some use of technology will be utilized in this class, unless otherwise told, cell phones are NOT allowed to be out during class. Your phone will be taken up if you have it out without permission. There is a cell phone parking station at the front of the room that I highly suggest you use so that you will remove the temptation of looking at your phone when you shouldn’t. On test days, ALL CELL PHONES and SMART WATCHES must be placed in the appropriate pocket on the parking station until the end of the period.

RESOURCES

TEXTBOOK

TEACHING RESOURCES

Final Examination for Angelo State Dual Credit will be April 29-30, 2020 during scheduled class.
**COURSE SYLLABUS**

**UNIT 0. DATA ANALYSIS AND MATHEMATICAL REPRESENTATIONS**
- Proper data collection and representation
- Algebraic representation of variables and isolation of variables
- Scientific Notation, system definition, problem solving and unit conversions
- Using Thermodynamics, Ideal Gas law, and Fluid Mechanics, apply the ideas of variable dependency and mathematical and unit representations.

**UNIT 1. KINEMATICS [CR2a]**
- Kinematics in one-dimension: constant velocity and uniform accelerated motion
- Vectors: vector components and resultant
- Kinematics in two-dimensions: projectile motion

**UNIT 2. DYNAMICS [CR2b]**
- Forces, types, and representation (FBD)
- Newton’s First, Second, and Third Laws
- Applications of Newton's Second Law
- Friction
- Interacting objects: ropes and pulleys

**UNIT 3. CIRCULAR MOTION AND GRAVITATION [CR2c]**
- Uniform circular motion
- Dynamics of uniform circular motion
- Universal Law of Gravitation

**UNIT 4. ENERGY [CR2f]**
- Work & Power
- Mechanical Energy – Kinetic, Gravitational and Elastic
- Conservation of energy

**UNIT 5. MOMENTUM [CR2e]**
- Impulse
- Momentum
- Conservation of momentum
- Elastic and inelastic collisions

**UNIT 6. SIMPLE HARMONIC MOTION [CR2d]**
- Linear restoring forces and simple harmonic motion
- Simple harmonic motion graphs
- Simple pendulum
- Mass-spring systems

CR2a—The course design provides opportunities for students to develop understanding of the foundational principles of Kinematics.

CR2b—The course design provides opportunities for students to develop understanding of the foundational principles of Dynamics.

CR2c—The course design provides opportunities for students to develop understanding of the foundational principles of gravitation and circular motion.

CR2f—The course design provides opportunities for students to develop understanding of the foundational principle of energy.

CR2e—The course design provides opportunities for students to develop understanding of the foundational principles of linear momentum.

CR2d—The course design provides opportunities for students to develop understanding of the foundational principles of simple harmonic motion.
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UNIT 7. ROTATIONAL MOTION [CR2g]
- Torque
- Center of mass
- Rotational kinematics
- Rotational dynamics and rotational inertia
- Rotational energy
- Angular momentum
- Conservation of angular momentum

UNIT 8. MECHANICAL WAVES [CR2j]
- Traveling waves
- Wave characteristics
- Sound
- Superposition
- Standing waves on a string
- Standing sound waves

UNIT 9. ELECTROSTATICS [CR2h]
- Electric charge and conservation of charge
- Electric force: Coulomb’s Law

UNIT 10. DC CIRCuits [CR2i]
- Ohm’s Law
- DC circuits
- Series and parallel connections
- Kirchhoff’s Laws

LABORATORY INVESTIGATIONS

The AP Physics 1 course devotes over 25% of the time to laboratory investigations. [CR5]
The laboratory component of the course allows the students to demonstrate the seven science
practices through a variety of investigations in all of the foundational principles.

The students use guided-inquiry (GI) or open-inquiry (OI) in the design of their
laboratory investigations. Some labs focus on investigating a physical phenomenon without
having expectations of its outcomes. In other experiments, the student has an expectation of its
outcome based on concepts constructed from prior experiences. In application experiments, the
students use acquired physics principles to address practical problems. Students also investigate
topic-related questions that are formulated through student designed/selected procedures.

Students are expected to record their observations, data, and data analyses. Data analyses include
identification of the sources and effects of experimental uncertainty, calculations, results, and conclusions, and suggestions for further
refinement of the experiment as appropriate. [CR7]
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INSTRUCTIONAL ACTIVITIES

Throughout the course, the students engage in a variety of activities designed to build the students’ reasoning skills and deepen their conceptual understanding of physics principles. Students conduct activities and projects that enable them to connect the concepts learned in class to real-world applications. Examples of activities are described below.

1. REAL WORLD APPLICATION
   ACTIVITY: Torque and Art [CR4]
   DESCRIPTION:
   This activity provides an opportunity for students to see the complexity in an everyday object. Students design and build a mobile that will demonstrate both translational and rotational equilibrium. They can use readily available materials in the classroom, their home, or they can use any other supplies as they wish. In their lab report, students are required to document the different stages of their design. Required elements include project procedure, design sketches, scaled blueprint, force diagrams, mathematical representations of translational and rotational equilibrium, and numerical calculations.
   Learning Objective 3.F.1.1
   The student is able to use representations of the relationship between force and torque.
   Learning Objective 3.F.1.2
   The student is able to compare the torques on an object caused by various forces.
   Learning Objective 3.F.1.3
   The student is able to estimate the torque on an object caused by various forces in comparison to other situations.
   Learning Objective 3.F.1.4
   The student is able to design an experiment and analyze data testing a question about torques in a balanced rigid system.
   Learning Objective 3.F.1.5
   The student is able to calculate torques on a two-dimensional system in static equilibrium, by examining a representation or model.

2. SCIENTIFIC ARGUMENTATION
   In the course, students become familiar with the three components of scientific argumentation. The first element is the claim, which is the response to a prediction. A claim provides an explanation for why or how something happens in a laboratory investigation. The second component is the evidence, which supports the claim and consists of the analysis of the data collected during the investigation. The third component consists of questioning, in which students examine and defend one another’s claims. Students receive explicit instruction in posing meaningful questions that include questions of clarification, questions that probe assumptions, and questions that probe implications and consequences. As a result of the scientific argumentation process, students are able to revise their claims and make revisions as appropriate [CR8].
   ACTIVITY 1: Formative Assessment: Changing Representations in Energy Description:
   Students work in pairs to create exercises that involve translation from one representation to another. Some possible translations are:
   - from a bar chart to a mathematical representation
   - from a physical situation diagram to a bar chart

CR3—Students have opportunities to apply AP Physics 1 learning objectives connecting across enduring understandings as described in the curriculum framework. These opportunities must occur in addition to those within laboratory investigations.

CR4—The course provides students with opportunities to apply their knowledge of physics principles to real-world questions or scenarios (including societal issues or technological innovations) to help them become scientifically literate citizens.

CR8—The course provides opportunities for students to develop written and oral scientific argumentation skills.
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Instructor: J. Dalrymple

- from a given equation to a bar chart 
Each pair of students exchanges their exercises with another pair. After the students work 
through the exercises they received, the pairs meet and offer constructive criticism (peer critique) on each other's solutions. 
**Learning Objective 5.B.4.1** 
The student is able to describe and make predictions about the internal energy of everyday systems. 
**Learning Objective 5.B.4.2** 
The student is able to calculate changes in kinetic energy and potential energy of a system, using information from representations of that system. 

**ACTIVITY 2: Real World Physics Solutions Description:** 
In order for students to become scientifically literate citizens, students are required to use their knowledge of physics while looking at a real world problem. [CR4] Students may pick one of the following solutions: 
- Students will pick a Hollywood movie and will point out three (or more) instances of bad physics. They will present this information to the class, describing the inaccuracies both qualitatively and quantitatively. 
- Students will research a thrill ride at an amusement park. They will present information to the class on the safety features of the ride, and why they are in place. 
- Students will present information to the class on noise pollution, and it's danger to both human and animal life. They will also propose solutions to noise pollution problems. 
- Students will go to the insurance institute of highway safety website (iihs.org) and will look at the safest cars in a crash. They will present information as to why these cars are safer and how the safety features keep people safe

**ASU Student Disability Services** 
ASU is committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs or activities of the university, or be subjected to discrimination by the university, as provided by the Americans with Disabilities Act of 1990 (ADA), the Americans with Disabilities Act Amendments of 2008 (ADAAA), and subsequent legislation. 
The Office of Student Affairs is the designated campus department charged with the responsibility of reviewing and authorizing requests for reasonable accommodations based on a disability, and it is the student's responsibility to initiate such a request by contacting:

**Ms. Dallas A. Swafford**  
325-942-2047 dallas.swafford@angelo.edu

- **ASU Academic Honesty**
**Academic Dishonesty**
The following are definitions of forms of academic dishonesty. The reason we are here is to hone our own individual skills and intellectual rigor, and as such, any form of academic dishonesty is an affront to our community. I have a zero tolerance policy for academic dishonesty in any form.
Central High School AP/DC Physics 2
Instructor: J. Dalrymple

- **CHEATING:** intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise.
- **FABRICATION:** intentional and unauthorized falsification or invention of any information or citation in an academic exercise.
- **FACILITATING ACADEMIC DISHONESTY:** intentionally or knowingly helping or attempting to help another to violate any provision of this Code.
- **PLAGIARISM:** intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise.

ASU Academic honesty: Academic misconduct includes cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, violations of published professional ethics/standards, and any act or attempted act designed to give unfair academic advantage to oneself or another student. See the Angelo State University Student Handbook, Part II B: Academic Integrity for more information.
Central High School AP/DC Physics 2
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THIS IS TO CERTIFY THAT I/WE HAVE RECEIVED A COPY OF THE COURSE SYLLABUS AND THE REQUIREMENTS FOR AP/DC PHYSICS 2. I have read the grading policies, academic honesty policy, and classroom expectations.

STUDENT SIGNATURE:__________________________________________

STUDENT’S PRINTED NAME: _____________________________________PERIOD:_______

STUDENT EMAIL ADDRESS:________________________________________

PARENT/GUARDIAN NAME:__________________________________________

PARENT/GUARDIAN SIGNATURE: __________________________________________

PARENT E-MAIL ADDRESS:__________________________________________

Parent Cell Phone(s): _____________________ Parent Home Phone(s):____________________

Student extracurricular activities and outside work: