Dallas High School
Home of the Dragons

Physics and Engineering

2013-2014

Instructor: Lee Jones

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Office Hours: Tues-Friday 10:10-11:00 and 3:00-3:30. Additional times by arrangement.

Course Description: This course deals with the composition of matter and the relationships between matter and energy, with special emphasis placed on the engineering and design process. The student will practice essential skills in laboratory work, use measurement in the metric system, develop inquiry skills, and use problem solving, while developing accuracy in measurement and graphing. Topics covered include motion in a straight line, the nature of forces using Newton's Laws of Motion, the effect of gravity on motion, centripetal motion and projectile motion, work and energy, thermodynamics, the phenomena of waves, sound, light and electromagnetic radiation, and static electricity, current electricity and interaction between electricity and magnetism. Physics is the most mathematical of all sciences and students who like math should find particular enjoyment in this course.

Course Outline *Physics is a very broad subject, with a variety of topics and subtopics. Due to time constraints, it is not always possible to reach all the units listed below. Every effort will be given to give students the best overview of physics and the engineering process.*

	Unit Topic	Summative Assessment	Big Idea's Addresses
Unit 1	Intro and Design	Rocket Design Project	1, 4
Unit 2	Newton's Laws and Friction	Unit 2 Test/ Truss Project	1, 2, 4
Unit 3	Work and Energy	Unit 3 Test/ Machine Project	1, 2, 4
Unit 4	Momentum	Unit 4 Test/ Mousetrap Car	1, 2, 4
Unit 5	1-D Motion	Unit 5 Test	1
Unit 6	2-D Motion and Vectors	Unit 6 Test/ Launcher Project	1, 4
Unit 7	Electrostatics	Unit 7 Test	1, 2
Unit 8	Electric Circuits	Unit 8 Test/ H-Cell Car	1, 2, 4
Unit 9	Vibrations and Waves	Unit 9 Test	1, 3
Unit 10	Sounds and Light	Unit 10 Test	1, 3
Unit 11	Reflection and Refraction	Unit 11 Test	1, 3
Unit 12	Robotics and Systems	Unit 12 Test/ Robot	4
Unit 13	Modern Physics	Unit 13 Test	1, 2, 3

Standards to Be Assessed:

Big Idea 1: Motions and Stability: Forces and Interaction - *How can one explain and predict interactions between objects and within systems of objects?*

- How can one predict an object's continued motion, changes in motion, or stability?
- What underlying forces explain the variety of interactions observed?
- Why are some physical systems more stable than others?

Big Idea 2: Energy-*How is energy transferred and conserved?*

- What is energy?
- What is meant by conservation of energy?
- How is energy transferred between objects or systems?
- How are forces related to energy?

Big Idea 3: Waves and Their Applications in Technologies for Information Transfer- *How are waves used to transfer energy and information?*

- What are the characteristic properties and behaviors of waves?
- What is light?
- How can one explain the varied effects that involve light?
- What other forms of electromagnetic radiation are there?
- How are instruments that transmit and detect waves used to extend human senses?

Big Idea 4: Engineering Design- *How do engineers solve problems?*

- What is a design for?
- What are the criteria and constraints of a successful solution?
- How can the various proposed design solutions be compared and improved?

Career Related Learning Standards: Career-related learning standards (CRLS) are fundamental skills essential for success in employment, college, family, and community life. We have integrated the Personal Management standard from the CRLS into all courses at DHS.**This standard will be assessed and communicated independent of the academic grade**. It is included below and mainly includes behaviors that will be assessed in this course.

- **Personal Management Standard**: Exhibit appropriate work ethic and behaviors in school, community and workplace.
    - Students will identify tasks that need to be done and initiate action to complete the tasks.
    - Students will plan, organize and complete projects and assigned tasks on time, meeting agreed upon standards of quality.
    - Students will take responsibility for decisions and actions and anticipate consequences of decisions and actions.
    - Students will maintain regular attendance and be on time daily.
    - Students will maintain appropriate interactions with colleagues.

Grading and Assessment:

Student's final grade for each course will be broken down into two categories:

1) **Academic:** based on assessments, tests, projects and performances that measure learning.
2)**Personal Management:** based on homework completion and other behaviors measuring the CRLS personal management standard.

The Final grade is calculated as follows: 75% of the course grade will be based on the **Academic** grade and **25%** on the **Personal Management** grade.

- Any items included in the Academic grade (PA) may be retaken and the higher grade recorded. Teachers may extend the retake time period, but as a rule all retakes need to be done within 2 weeks of the initial assessment.
- Students will complete extra preparation before retaking an assessment.
- Personal management work turned in late may be reduced by up to 50% credit.
- Retakes are not allowed on Personal Management assignments.

Academic Integrity: We expect students to express academic integrity by doing their own work and properly documenting information gathered from other sources. Students who violate the principles of academic integrity will be subject to disciplinary consequences (see Insubordination section of the on-line student agenda).

Tardies and Unexcused Absences: Points will be given towards the Personal Management grade at the end of each grading period (9 weeks/18 weeks) for daily attendance and punctuality. Points will be deducted for each tardy and each unexcused absence in that 9-week grading period. Overly disruptive behavior may also result in loss of attendance points.

Classroom Needs:
All students will need the following items:

- Scientific Calculator (sin, cos, tan)
- Notebook (single subject, college ruled or graph paper)

Parents: **Please keep the rest of the syllabus**. By signing this form, you acknowledge that you have read and fully understood the expectations, rules, and standards associated with Physics. If you have questions, please call 503-623-8336 ext 3910 or email using the email address provided in this document.

Parent Name: _____

Parent Signature: _____

Parent email Address: _____

Parent Phone: _____

Student Name: _____

Student Signature: _____