

Course Title: Theoretical Physics

Course Description:

“The most incomprehensible thing about the world is that it is comprehensible.”—Einstein.

This non-mathematical approach to the applications of physics in real-life settings helps students better comprehend the world around them and prepares them for later explorations in this discipline. By studying the physical principles underlying classical mechanics, students develop the foundation to learn the equations and formulas of physics.

Learning Objectives: By the end of this course, students will be able answer the following questions:

1. What is physics?
2. Why study physics?
3. Why is measurement important?
4. How do you gather and organize experimental observations?
5. How do you construct and interpret graphs?
6. How do you write a lab report?
7. What is motion and how do you study and investigate it?
8. What is force and how do you study and investigate it?
9. What is gravity and how do you study and investigate it?
10. What are waves and how do you study and investigate it?
11. What is sound and how do you study and investigate it?
12. What is color and how do you study and investigate it?
13. What is light and how do you study and investigate it?
14. What is magnetism and how do you study and investigate it?
15. What is electricity and how do you study and investigate it?

Resources and Materials:

Online Readings from

- Vision Learning—Physics
<http://www.visionlearning.com/library/index.php>
- Physics Classroom
<http://www.glenbrook.k12.il.us/gbssci/Phys/Class/Bboard.html>
- Hippocampus Tutorials
<http://www.hippocampus.org/>
- Physics Cent

- The Mechanical Universe
<http://www.learner.org/resources/series42.html>
- Online Lab and Tutorial sites
- Calculator

Student Evaluation and Grading Policies for Enrichment Courses:

Since this is an enrichment class, a narrative evaluation will be written at the conclusion of the course. Students will be evaluated on the quality of their work, participation in activities and discussions, and performance on labs and projects. Points are used to assess mastery of the course content and skills, but NOT to award a final grade. Students will also be evaluated on timely submission of assignments, participation, and ability to work and learn independently.

Instructor Biography:

Mrs. Nuño teaches chemistry, physics, and AP Biology at an independent school in western Massachusetts. She has as a B.S. in environmental health from UCLA, an M. A. in biological science from UC Santa Barbara, a certificate in online education from UCLA, and extensive course work in science education. She now lives on a tree farm in southern Vermont!

Contact Information :

Email : xxx@xxx.xxx

Cyber Office Hours (East Coast Time)

Daily: 5 - 6 am

Tuesday: 6 - 7 pm

Wednesday: 7 - 8 pm

Course Timeline:

Dates	Topics	Activities	Labs
Jan 15—22	Orientation to Online Learning		
Jan 23 - 29	Fundamentals	What do Physicists Do? Physics Life Scientific Method	Bouncing Balls Measuring Temperature Scientific Method Labs
Jan 30 – Feb 5	Motion	Roller Coasters Speed Machines Moving Earth	Air Resistance Motion Toy Cars
Feb 6- Feb 12	Forces and Energy	Billiard Balls Nuclear Power Satellites Tides	Motion Crash Test Energy Labs Gravity
Feb 13 – Feb 19	Waves	Wave Types Earthquakes Radiowaves, Microwaves Ocean Waves	Waves on a String Wave Characteristics Earthquake Epicenter Earthquake Waves

Dates	Topics	Activities	Labs
Feb 20 – Feb 26	Sound, Light, Color	Sonic Boom Bats and Whales RGB Color	Color Mixing Musical Sounds Vision and Lenses
Feb 27 – Mar 4	Electricity and Magnetism	Flashlights Batteries Electric Circuits	Generators Transformers Current and Voltage
Mar 5 – Mar 19	Student Presentations	Comment on Student Presentations	Report on Physicist or Physics Topic

GLL Sample