

2011-12 NEHI Physics Prep Summer Seminar

Welcome to Physics I Honors. In general, Physics is the study of mass and energy. More specifically, the objectives of the study of Physics are to understand how and why all events in the physical universe take place and to reduce those events to mathematical certainties. Physics has both theoretical and quantitative aspects. The purpose of the Physics Math Preparation Course is to ensure all students entering Physics I or Physics I Honors are equipped with the math foundation essential to initiate the study of Physics.

There is nothing particularly difficult about the math required to undertake the study of Physics; however, the application of the math concepts introduced in Algebra II Honors and Chemistry Honors in order to study of Physics may require refinement. The following syllabus is structured to prepare students to engage in the study of Physics on the first day of class. Each session will run from 8:00 AM – Noon in Room 28-30. Students need to bring a notepad, calculator and pen to each session. Students will need to either park in the Building 28 parking lot or enter from the west side of the campus.

Monday, August 1

Basic Standards of Measurement/Dimensional Analysis/US v. Metric

- A. Length, Area, Volume
- B. Weight v. Mass
 - 1. Law of Universal Gravitation
 - 2. Pressure
 - 3. Density

Tuesday, August 2

Basic Standards of Measurement/Dimensional Analysis/US v. Metric

- A. Time
- B. Temperature
 - 1. Kinetic Theory of Matter
 - 2. Heat Transfer – conduction, convection, radiation
 - 3. Phase diagrams at constant pressure

Wednesday, August 3

Basic Geometry and Trigonometry/Vectors

- A. Perimeter, Interior Area, Surface Area, Volume Review
- B. Sine, Cosine, Tangent Applications
- C. Introduction to Vectors

Thursday, August 4

Vector Operations

- A. Vector Addition
- B. Vector Multiplication

Monday, August 8

Vector Operations

- A. Vector Addition**
- B. Vector Multiplication**

Radial Measurement

- A. Radians**

Tuesday, August 9

Scientific Notation/Significant Digits

A. Scientific Notation

- 1. Addition, subtraction, multiplication, division, exponentiation**
- 2. Dimensional Analysis**

B. Significant Digits

- 1. Addition, subtraction, multiplication, division, exponentiation**
- 2. Precision v. accuracy cf. Reliability v. Validity**

Wednesday, August 10

Equation Simplification/Unit Analysis

- A. Equation Simplification**
- B. Unit Analysis**

Thursday, August 11

Functional Analysis/Equivalence of Data Streams

A. Functional Analysis

- 1. Linear**
- 2. Inverse**
- 3. Quadratic**
- 4. Logarithmic**
- 5. Cartesian v. Polar v. Spherical Coordinate Systems**

B. Equivalence of Data Streams

- 1. Discursive, tabular, graphic, equation data streams**
- 2. Solving word problems**

Physics Prep Summer Sessions

Room 28-30

Monday – Thursday August 1 – 4 8:00 AM – Noon

Monday – Thursday August 8 – 11 8:00 AM – Noon

Contact Information: McCauley F @ PCSB.org