

Syllabus of Physics I

This course teaches Physics mechanics. It is for the students who have finished Algebra in math. No Physics experience is needed. After finishing this course, the students will be able to take AP Physics I test, and attend the "F=ma" Contest [*The procedure to select the U.S. Physics Olympic team consists of two exams: the "F=ma" and the "USA Physics Olympiad" (USAPhO)*]. The course covers the following contents:

- 1. Introduction of Physics**
- 2. Vectors**
 - Definition of Vectors
 - Addition of Vectors
 - Subtraction of Vectors
 - Components of Vectors
- 3. Kinematics**
 - Velocity, displacement, and Acceleration
 - Kinematics equations
 - Acceleration due to gravity
 - Graphic analysis of Motion
 - Projectile motion
 - Uniform Circular motion
- 4. Forces and Newton's Laws**
 - Forces (Weight, Friction, Normal forces)
 - Newton's law of Motion and application
 - Central Forces
- 5. Energy**
 - Work
 - Power
 - Kinetic Energy and the Work-Energy Theorem
 - Conservation of Energy and Systems
- 6. Oscillatory Motion**
 - Simple Harmonic Motion: A Mass on a Spring
 - Simple Harmonic Motion: A simple Pendulum
- 7. Waves and Sound**
 - Wave Motion
 - Types of Waves
 - Sound
- 8. Gravitation**
 - Newton's Law of Universal Gravitation
 - Gravitation Energy
- 9. Impacts and Linear Momentum**
 - Impact Forces and Momentum changes
 - The Law of Conservation of Linear Momentum
 - Elastic and Inelastic Collision
- 10. Rotational Motion**
 - Parallel Forces and Moments
 - Torque
 - Moment of Inertia
 - Angular Kinematics
 - Angular Momentum.

Resume of Instructor

Guozhen Yue obtained his Ph.D degree in Physics from Chinese Academy of Sciences. After graduation, he moved to University of North Carolina at Chapel Hill in USA for his Post-Doctor work. He has dedicated to Research and Development (R&D) work for more than ten years. During this period, he published around 100 research papers in the well-known international journals. Mr. Yue had high school Physics teaching experience for two years in China, and currently works in a high technology company in the U.S.

Mr. Yue has served the AGWCS board since 2018. He loves Chinese school. After leaving the board, he is willing to continue his dedication to the Chinese community.