

FRANKFORT JR./SR. HIGH SCHOOL
PHYSICS
Course Syllabus

- Course Information
 - Course Name: Physics
 - Pre-requisites: Biology, Chemistry, and the Math sequence through Algebra II with concurrent enrollment in Advanced Math preferred.

- Contact Information
 - Teacher: Mr. Tim Reznich
 - Room Number: High School Room 6
 - Conference: By appointment
 - School Phone & Extension Number: High School 1-231-352-4781; Extension:206
 - Email Address: treznich@frankfort.tbaisd.k12.mi.us

- Materials
 - Text: Physics-Principles and Problems; Zitzewitz , Glencoe,1995
 - Other Materials: Lab equipment/Instructional materials supplied by the school

- Course Description
 - Physics is a branch of knowledge that studies the physical world, more specifically, it is the study of the nature of matter and energy. Physics is about what happens in the world all around us, from rainbows to interplanetary space probes. It includes such things as walking, bicycling, cars, planes, computers, I-pods, athletics, TV's, and developing alternative forms of energy that will free human-kind from the specter of finite energy supplies.
 - Studying Physics will give the student an insight into the "Natural Laws" that govern matter and energy and which may lead to an exciting career that will help advance science and technology.

A citizen, with knowledge of Physics, will be better able to appreciate the Natural World and utilize the Principles of Physics in their daily lives as well as being able to make informed decisions about the difficult questions that advances in technology pose for our society.
 - The study of matter and energy, in depth, will cover topics such as, but not limited too, motion, forces, work, energy, thermal energy, states of matter, waves, sound , light , electricity, and nuclear applications.
 - The study and comprehension of these topics will require high levels in reading comprehension, math skills, and problem solving techniques. These required skills and techniques will continue to be developed as the course progresses.

- Course Methodology

The Physics class at Frankfort High School will develop the concepts for each topic through teacher presentation of the topic, examples, student reflection of the topic including their own examples and experiences, classroom discussion, demonstrations, hands-on labs, math problems related to the topic, and extension of the topic into society and daily life.

Student Responsibilities:

To be successful in Physics it will be absolutely necessary for the student to stay current in the daily reading, outlining, note-taking, discussions, labs, lab reports and assigned problems. It is understood that Physics is a rigorous course, earning 1.5 credits, providing an environment for individual student academic growth. Physics, as a college prep course, will assist the student in preparing for the academic responsibilities associated with college success. The student and teacher are expected to work closely together, in this environment, to meet the student's academic needs. Student evaluation for each marking period will be based on completed daily home-work assignments, lab "write-ups", Chapter tests, and assigned projects. Semester grades will be computed from marking-period grades (80%) and a Semester Final Exam (20%).

Physics Course Content and Outline:

- Mathematical Review*: significant digits
- Describing Motion*:
 - Velocity: displacement, constant velocity, position-time graph, instantaneous velocity, velocity-time graph
 - Acceleration*: average acceleration, instantaneous acceleration, velocity of an object with constant acceleration, displacement during constant acceleration, displacement when acceleration and time are known, displacement when velocity and acceleration are known, acceleration due to gravity
 - Forces*: Newton's Laws of Motion(3): Inertia, Net Force produces acceleration, Action/Reaction; mass vs. weight, friction, terminal velocity; Rockets: net force produces acceleration, impulse
 - Vectors*: addition, addition of several vectors, analytical method of vector addition, adding perpendicular vectors, components of vectors, adding vectors at any angle, application of vectors, equilibrium, gravitational force and inclined planes,
 - Motion in Two Dimensions*: independence of motion in two dimensions, horizontal motion, motion of object launched at any angle, periodic motion, circular motion, torque, simple harmonic motion,
 - Momentum and its Conservation*
 - Universal Gravitation*
 - Energy*: kinetic, potential, conservation of energy, elastic collisions, inelastic collisions
 - Thermal Energy*: temperature and thermal energy, conduction, convection, radiation, temperature, thermal equilibrium, heat and thermal energy, specific heat, change of state and thermodynamics, heat of fusion, heat of vaporization
 - Work, Energy, and Simple Machines*: work, work and direction of force, machines: simple, complex, energy conservation and mechanical advantage, power, efficiency
 - Sound*: properties of waves: wave length, frequency, velocity, amplitude, doppler shift, pitch/loudness, sound and music, closed-pipe resonator, standing wave, hearing, quality of sound
 - Light*: light fundamentals, speed of light, sources of light, light and matter, polarization of light
 - Reflection and Refraction*: law of reflection, refraction of light, Snell's law, index of refraction, total internal reflection, dispersion of light

- ❑ *Mirrors and Lenses*: reflections, concave mirrors, convex mirrors, lenses, double convex, law of lenses, vision
- ❑ *Diffraction and Interference of Light*
- ❑ *Static Electricity*: electrical charges, charged objects, conductors and insulators
- ❑ *Current Electricity*: producing electric current, rates of charge flow, resistance and Ohm's law, diagram circuits, energy transfer in electric circuits, transmission of electric charge
- ❑ *Series and Parallel Circuits*: series circuits, parallel circuits, applications of circuits, voltmeters/ammeters
- ❑ *Magnetic Fields*: general properties of magnets, magnetic fields, electromagnetism, forces caused by magnetic fields, electric motors
- ❑ *Nuclear Applications*: nuclear forces, artificial radioactivity, nuclear fission, nuclear fusion, nuclear application
- ❑ Grading Method & Scale:
 - ❑ The Physics Course will utilize the Frankfort High School uniform grading scale found on page 12 in the student handbook.
 - ❑ Student evaluation for each marking period will be based on completed daily Chapter home-work assignments including reading/outlining and problems, lab "write-ups", Chapter tests, and assigned projects. Semester grades will be computed from marking-period grades (80%) and a Semester Final Exam (20%).
- ❑ Policy Information
 - ❑ Attendance/Tardy policy— see page(s) 35 and 36 in the Student Handbook
 - ❑ Policy for Assignment Make-up Due to Absence – see page(s) 36 and 37 in the Student Handbook- in part "Assignments/tests missed due to absence are the responsibility of the student ". "If a student misses a planned test or quiz given during the first class session of a regular absence, the student will complete the test or quiz no later than the end of the day (3:05PM) of the first session the student returns to class. Homework assignments due the first session of a regular absence will be due to later than the beginning of the first session the student returns to class." Note: see the handbook on pages 36 and 37 for an expanded discussion on Assignment Make-up Due to Absence – see teacher for arrangement of making-up missed tests
 - ❑ Leaving school early and missing a scheduled class: if you are at school for any part of a day that an assignment is due you must turn it in before leaving school
 - ❑ Student Ethics Policy – see page 19 in the student handbook
 - ❑ Student Code of Conduct – see page(s) 23 - 32
- ❑ *NOTE*: "This syllabus is a guide for the course and is subject to change *with* advance notice."