

Physics

Physics 2022-23

Hours: B (T, W, Th, F)

Teacher: Mr. Bickel

Classroom 144

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Course Description: This course is a survey of Physics. In this course we will cover topics on mechanics, properties of matter, heat, sound and light, electricity and magnetism, and atomic and nuclear physics.

Methods: Discussion/notes, labs, presentations, project engineering, and cooperative learning. Assignments and lessons are going to be integrated in google classroom. Students should log into the classroom site regularly to get updates and find resources. Many of the assignments will be submitted as digital copies through our class on google classroom.

Materials: Textbooks need to be handled with a high level of respect and care. Scientific or graphing calculators are required. Also, binders are highly recommended to improve organization. Instructor will inform students if other tools or materials are needed.

Grading: Grades are determined on a percentage basis. Each quarter grade will be 40% of the final semester grade. There will also be a final exam that weighs 20% of the grade. Each quarter grade will be figured based on the percentage breakdown below:

- Tests = 50%
- Labs = 20%
- Projects = 20%
- Homework = 10%

Course Goals:

Students will be able to:

- Demonstrate an understanding of the language of physics through descriptions of concepts and quantitative application.
- Describe the motion of objects in one-dimensional analysis.
- Analyze the motion of a projectile object and apply the Pythagorean Theorem to solving 2- dimensional problems.
- Distinguish between Newton's laws of motion and apply them to real-world applications.
- Describe work and energy and discuss how they are related.
- Apply the conservation of momentum to the analysis of collisions.
- Analyze the effects of circular motion on objects on Earth and in space.
- Describe how Archimedes' and Bernoulli's principles are used in industry today.

- Distinguish heat and temperature.
- Describe the laws of thermodynamics.
- Distinguish the different types of waves.
- Apply the properties of sound waves to the concept of harmonics.
- Use the properties of mirrors to predict the sizes and orientation of objects or images.
- Identify optical phenomena (rainbows, mirages, etc.) that are caused by the refraction of light.
- Distinguish between diffraction and interference of light waves.
- Relate electric fields to electric force.
- Describe how electric potential, capacitance, and resistance relate to electric energy.
- Analyze and draw schematic diagrams of circuits.
- Apply scientific inquiry to laboratory design and discussion.
- Analyze the strengths and weaknesses of current scientific research

Outcomes: There will be homework throughout a chapter that will be collected before each test, if not earlier. There will be approximately 10 tests first semester and 8 scheduled for the second semester along with a number of quizzes. There could be quizzes assigned along the way. There will be minor projects throughout the course. Projects could be papers, presentations, or projects. For each lab, there will be a write-up due two days after the lab is finalized.

Extra Credit: Extra credit is reserved for opportunities that student can use to go beyond the present scope of the class. Students can also earn half their credit back on tests by turning in corrections. The instructor will provide information on the format corrections should take after the first test.

Late Work: It is the responsibility of the student to ensure that all assigned work be turned in completed and on time. Each student is encouraged to discuss any due date extensions. The instructor may take off points on any assignment if deemed necessary to ensure that the work is submitted.

Attendance/Tardiness: The attendance policy is explained in the student handbook. Tardiness to class will be defined as not in the classroom prepared for chemistry to start. Waiting until the bell rings to go to your locker to get something you needed for class will be considered being unprepared and may result in a tardy for that period. Please communicate if there are any prolonged stretches for absences in order that a plan can be made to keep up with the school work.

Cheating/Plagiarism: These are serious infractions. Lutheran High holds to high character expectations. Do not take or borrow another student, adult or teacher's work. Seeking someone to help facilitate your understanding is not cheating or plagiarism. All

work you hand in needs to be your original work, whether it is a test, homework or research for a project. Infractions will be dealt with as the handbook, instructor and administrators decide. The penalties will be severe and the students risks both failing the assignment or the class. Please turn in your own work. Do the right thing.

Electronics: Electronic devices that can broadcast and use the web must be placed on the front of the desk or table when the student gets ready for class. The instructor will indicate when it is ok to use devices. Use of social media for purposes other than educational will result in the device being taken to the office. If a student is seen using a device during times other than when the instructor has indicated, it will be taken and given to office.

School year at a glance:

Semester 1:		Semester 2:	
Week 1	Displacement/Velocity	Week 1	Temperature
Week 2	Acceleration	Week 2	Heat Flow
Week 3	Forces	Week 3	Electric Potential
Week 4	Types of Forces	Week 4	Electric Circuit
Week 5	Forces on Systems	Week 5	Energy Conservation
Week 6	Earth's Forces	Week 6	Wave Properties
Week 7	Universal Gravitation	Week 7	Wave Optics
Week 8	Orbital Motion	Week 8	Spring Break
Week 9	Columb's Law	Week 9	EM Waves
Week 10	Electric Fields and Current	Week 10	Particle-Wave Duality
Week 11	Magnetism	Week 11	Digital Information
Week 12	Magnetic Currents	Week 12	Transmitting Energy
Week 13	Atoms/Atomic Structure	Week 13	Nuclear Particles
Week 14	Attractive/Repulsive Forces	Week 14	Nuclear Forces
Week 15	Classifying Works	Week 15	Application in Geology
Week 16	Mechanical Energy	Week 16	Applications in Astronomy
Week 17	Momentum/Impulse	Week 17	Finals
Week 18	Conservation of Momentum		
Week 19	Finals		