



SUBJECT: Physics

GRADE LEVEL: 11

TEACHER: Ms. Victoria Santiago

SCHOOL YEAR: 2024-25

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COURSE DESCRIPTION:

Physics is the branch of knowledge that studies the physical world. This course is based on concepts-before-computation and provides comprehensive content which builds conceptual understanding and offers computational reinforcement. Examples make powerful connections to student's real lives. More hands-on activities are carried out to allow students to explore concepts and bring the concepts of physics to life. Throughout this course, the emphasis is on the teaching of concepts and the development of creative problem solving and higher order thinking skills.

Physics contributes to the development of chemistry, computing, engineering, environmental science, life sciences, material science, mathematics, medicine, physics education, and statistics.

The physics course is classified into three categories such as Forces and Interactions, Energy, Waves and Their Applications in Technologies for Information Transfer.

This course best prepares students for college level physics and nurtures a scientific outlook for everyday life.

COURSE OBJECTIVES:

Physics curriculum is aligned to Next Generation Science Standards (NGSS).

Forces and Interactions

HS-PS2-1: Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.

HS-PS2-2: Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system.

HS-PS2-3: Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.

HS-PS2-4: Use mathematical representations of Newton's Law of Gravitation and Coulomb's Law to describe and predict the gravitational and electrostatic forces between objects.

HS-PS2-5: Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.

Energy

HS-PS3-1: Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and every flow in and out of the system are known.

HS-PS3-2: Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a either motions of particles or energy stored in fields.

HS-PS3-3: Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

HS-PS3-4: Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics).

HS-PS3-5: Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction.

Waves and Electromagnetic Radiation

HS-PS4-1: Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.

HS-PS4-2: Evaluate questions about the advantages of using a digital transmission and storage of information.

HS-PS4-3: Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other.

HS-PS4-4: Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter.

HS-PS4-5: Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.

PRIMARY TEXTBOOK & OTHER RESOURCES:

PRIMARY TEXTBOOK

Pearson Physics by James S. Walker
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OTHER RESOURCES

<http://www.physicsclassroom.com/mmedia/vectors/sat.cfm>
<https://www.khanacademy.org>
<https://www.pbslearningmedia.org/>
<https://quizizz.com/>

ASSESSMENT:

Pop Quizzes will be conducted now and then.

They will be given a chapter test after the completion of every chapter.

Quarter exam will be conducted at the end of each quarter.

Projects, Lab Activities, Homework, and Seatwork will also be assessed.

This course will be assessed on the following four categories:

- Tests and Quizzes (30%)
- Seatwork, Homework and Participation (30%)
- Quarter Exam (30%)
- Department (10%)

ADDITIONAL INFORMATION:

Any act of academic dishonesty will result in an automatic zero on the entire assignment

Google Classroom code: en3gh5y

1st QUARTER – TENTATIVE COURSE CONTENT

Week / Date	Topic / Projects / Assessments
Week 1 Aug 12th to 16th 12~ First Day / Orientation Day 15~ Opening Mass & Assumption of Our Lady 8:00 15~ Induction of Class, Student Council Officers and DYM	Discussion of class rules, collecting text books from the library. <u>Chapter 2: Introduction to Motion</u>
Week 2 Aug 19th to 23rd	<u>Chapter 2: Introduction to Motion</u> 2.1: Describing Motion 2.2: Speed and Velocity 2.3: Position- Time Graphs
Week 3 Aug 26st to 30th 26~Fire drill? 26~Middle and High School Catholic Bridge Program (after assembly) 28~St. Dominic de Guzman Feast Day Celebration	<u>Chapter 3: Acceleration and Accelerated Motion</u> 3.1: Acceleration Lab Activity: Position versus Time for a constant velocity car (TB, Page 64)
Week 4 Sep 2nd to 6th 2~House Ceremony	<u>Chapter 5: Newton's Laws of Motion</u> 5.1: Newton's Laws of Motion

	<p>Lab Activity: Determine the variation of the acceleration of a dynamics cart in two scenarios: (1) the total mass of the system is kept constant while the net force varies, and (2) the net force is kept constant while the total mass of the system varies</p> <p>Chapter 2 & 3 Test</p>
<p>Week 5 Sep 9th to 13th 9~ Mass & Birthday Mother Mary& VIP Induction</p>	<p>5.2: Applying Newton's Laws 5.3: Friction</p> <p>Lab Activity: Static and Kinetic friction (TB, Page 178)</p>
<p>Week 6 Sep 16th to 20th 1 Day of Class 17~Moon Festival 18-20~ Teacher's Conference</p>	<p>Chapter 5 Test</p>
<p>Week 7 Sep 23rd to 27th 24-26~Pre-Exam Days</p>	<p><u>Chapter 7: Linear Momentum and Collisions</u></p> <p>7.2: Impulse 7.3: Conservation of momentum</p>
<p>Week 8 Sep 30th to Oct 4th</p>	<p>7.4: Collisions <u>Chapter 8: Rotational Motion and Equilibrium</u></p> <p>8.1: Describing Angular Motion 8.3: Torque</p>
<p>Week 9 Oct 7th to 11th 1 Day of Class 7~Launching - Rosary Month and Bullying Prevention Day 8-9 ~Q1 Exams 10~Double Ten 11~Record Day</p>	<p>Review</p> <p>First Quarter Examination</p>

2nd QUARTER – TENTATIVE COURSE CONTENT

<i>(NB: Depending on time and interest, the teacher may delete and/or add other selections.)</i>	
Week / Date	Topic / Projects / Assessments
<p>Week 1 (10) Oct 14th to 18th 14~ Second Quarter Begins</p>	<p>Give out First Quarter Exam papers and discuss the answers. <u>Chapter 9: Gravity and Circular Motion</u></p> <p>9.1: Newton's Law of Universal Gravity</p>
<p>Week 2 (11) Oct 21st to 25th 25 – Book Fair 25- Masquerade Night</p>	<p>9.2: Applications of Gravity</p> <p><u>Chapter 19: Electric Charges and Forces</u></p>

	19.1: Electric Charge
Week 3 (12) Oct 28th to Nov 1st 1-All Saint's Day Mass	19.2: Electric Force 19.3: Combining Electric Forces Chapter 9 Test
Week 4 (13) Nov 4th to Nov 8th	<u>Chapter 21: Electric Current and Electric Circuits</u> 21.1: Electric Current, Resistance, and Semiconductors Chapter 19 Test
Week 5 (14) Nov 11th to 15th	21.2: Electric Circuits Lab Activity: Ohm's Law (TB, Page 773) Quiz: 21.1
Week 6 (15) Nov 18th to 22nd 22-Gr.12 Q2 Exam 22 - YSC Contest	21.3: Power and Energy in Electric Circuits Quiz: 21.2
Week 7 (16) Nov 25th to 29th 25-Gr.12 Q2 Exam 26-28~Pre-Exam Day	22.2: Magnetism and Electric Currents
Week 8 (17) Dec 2nd to Dec 6th <u>6~Half Day</u> Foundation Day Celebrations	22.3: The Magnetic Force Lab Activity: Mapping Magnetic Fields (TB, Page 808)
Week 9 (18) Dec 9th to 13th <u>3 Days of Class</u> 12-13 ~Q2 Exams	Review Second Quarter Examination
Dec 16th to Jan 3rd	Christmas Break

3rd QUARTER – TENTATIVE COURSE CONTENT

(NB: Depending on time and interest, the teacher may delete and/or add other selections.)

Week / Date	Topic / Projects / Assessments
<p style="text-align: center;">Week 1 (19) Jan 6th to 10th <u>4 Days of Class</u> 6~Record Day 7~Third Quarter Begins 10 ~ New Year Mass</p>	<p style="text-align: center;">Give out Second Quarter Exam papers and discuss the answers.</p> <p style="text-align: center;"><u>Chapter 6: Work and Energy</u></p> <p>Introduction: 6.1: Work</p>
<p style="text-align: center;">Week 2 (20) Jan 13th to 17th</p>	<p>6.3: Conservation of Energy 6.4: Power</p> <p>Lab Activity: Investigating Work on Inclined Planes (TB, Page 218).</p>
<p style="text-align: center;">Week 3 (21) Jan 20th to 24th</p>	<p style="text-align: center;"><u>Chapter 10: Temperature and Heat</u></p> <p>10.1: Temperature, Energy and Heat 10.3: Heat Capacity</p> <p>Lab Activity: Investigating Specific Heat Capacity (TB, Page 376)</p>
Jan 27th to Jan 31st	Chinese New Year
<p style="text-align: center;">Week 4 (22) Feb 3rd to 7th</p>	<p>10.4: Phase Changes and Latent Heat</p> <p style="text-align: center;">Chapter 6 Test</p>
<p style="text-align: center;">Week 5 (23) Feb 10th to 14th 1-14~Catholic Week</p>	<p style="text-align: center;"><u>Chapter 11: Thermodynamics</u></p> <p>11.1: The First Law of Thermodynamics 11.2: Thermal Processes</p>
<p style="text-align: center;">Week 6 (24) Feb 17th to 21st</p>	<p>11.3: The Second and Third Laws of Thermodynamics</p> <p style="text-align: center;">Chapter 10 Test</p> <p style="text-align: center;"><u>Chapter 20: Electric Fields and Electric Energy</u></p> <p>20.1: The Electric Field</p> <p>Lab Activity: Mapping an Electric Field (TB, Page 736).</p>
<p style="text-align: center;">Week 7 (25) Feb 24th to 28th <u>4 Days of Class</u> 24~Lenten Mass? 25-27 ~ Pre-Exam Days 24-27~IOWA Assessments 28 ~ Memorial Day Holiday</p>	<p>20.2: Electric Potential Energy and Electric Potential</p> <p style="text-align: center;">Chapter 11 Test</p>

Week 8 (26) March 3rd to 7th 5~ Ash Wednesday	20.3: Capacitance and Energy Storage
Week 9 (27) March 10th to 14th <u>4 Days of Class</u> 14 – Q3 Exams	Review Third Quarter Examination

4th QUARTER – TENTATIVE COURSE CONTENT

Week / Date	Topic / Projects / Assessments
Week 1 (28) March 17th 21st <u>4 Days of Class</u> 17 – Q3 Exams 18~ Fourth Quarter Begins 18~ Fire Drill? 19~ Feast of St. Joseph	Give out Third Quarter Exam papers and discuss the answers. <u>Chapter 13: Oscillations and Waves</u> 13.3: Waves and Wave Properties.
Week 2 (29) March 24th to 28th	<u>Chapter 14: Sound</u> 14.1: Sound Waves and Beats 14.3: The Doppler Effect
Week 3 (30) March 31st to April 4th <u>4 Days of Class</u> 4~Tomb Sweeping	<u>Chapter 15: The Properties of Light</u> 15.1: The Nature of Light 15.2: Color and the Electromagnetic Spectrum
Week 4 (31) Apr 7th to 11th	15.3: Polarization and Scattering of Light Chapter 13 & 14 Test
April 14th to April 18th	Easter Break
Week 5 (32) Apr 21st to 25th 23~Easter Mass 21-25 ~ AP Mock Exams 26~Spring Fair	<u>Chapter 17: Refraction and Lenses</u> 17.1: Refraction Lab Activity: Refraction through a glass slab Chapter 15 Test
Week 6 (33) Apr 28th to May 2nd 4/29-5/1~ Pre-Exam Days 1-2~ Final Exams (K, 5, 8, 12 only)	<u>Chapter 17: Refraction and Lenses</u> 17.2: Applications of Refraction 17.4: Applications of Lenses
Week 7 (34) May 5th to 9th 5-9~ Final Exams (K, 5, 8, 12 only) 5-9 ~ AP Exams	Lab Activity: Find the focal length of a given convex lens. Chapter 17 Test
Week 8 (35) May 12th to 16th	Review for the Quarter Exam

<p><u>4 Days of Class</u> 14-15~ Q4 Exam 16~ Record Day 12-16 ~ AP Exams</p>	<p>Fourth Quarter Exam</p>
<p>Week 9 (36) May 19th to 23rd</p>	<p>19-23 ~ Student Clearance 19~ Baccalaureate Mass 23~Gr. 6 – 7 Recognition and Gr. 8 Graduation</p>
<p>Week 10 (37) May 26th to 30th</p>	<p>26~House Culminating Activity 27~Gr. 9-11 Recognition and Gr. 12 Graduation 28! Class Party 29- ~ Students Last Day 30~ Teachers/Staff Meeting</p>