



Course: Physics 12

Course Description:

This course aims to introduce students to the foundations of Physical Science and to develop a scientific attitude toward understanding and describing how the world behaves. In this introductory level course, the topics covered include the study of kinematics (mathematics of motion), vector diagrams, gravity, the fundamental forces (electrical, gravitational and nuclear), and nuclear and quantum physics.

Big Ideas:

- Measurement of motion depends on our frame of reference.
- Forces can cause linear and circular motion.
- Forces and energy interactions occur within **fields**.
- Momentum is conserved within a closed and isolated system.

Core Competencies:

Communication

- Contribute during group activities, cooperate with others, and listen respectfully to their ideas.
- Communicate clearly about topics you know and understand well, using forms and strategies they have practiced.
- Identify and apply roles and strategies to facilitate groupwork.
- Recognize how your contributions and those of others complete each other. Plan with others and adjust your plan according to the group's purpose.
- Get new ideas or reinterpret other's ideas in novel ways.

Thinking

- Use observation and data to draw conclusions, make judgements, and ask new questions.
- Consider more than one way to proceed and make choices based on your reasoning and what you are trying to do.
- Use your imagination to get new ideas of your own, or build on other's ideas, or combine other people's ideas in new ways.
- Assess your own efforts and experiences and identify new goals (give, receive, and act on constructive feedback).
- Ask questions and offer judgments, conclusions, and interpretations supported by evidence or other have gathered.

Personal & Social

- Act toward meeting your own wants and needs and find joy and satisfaction, and work toward a goal or solving a problem.
- Can interact with others and your surroundings respectfully.
- Can identify your individual characteristics and explain what interests you.
- Can describe different groups that you belong to.



Course Content:

Week 1: Kinetics
Week 2 - 4: Forces and Equilibrium
Week 5 - 7: Energy and Momentum
Week 7 – 9 Circular Motion and Gravitation
Week 10 – 12: Electro-statics and Electric Potential
Week 13 – 14: Electromagnetism

Resources:

Physics. Principles with Applications, Douglas C. Giancoli, 7th Edition, 2014, Pearson Prentice Hall Publishers.

With respects to the First People's Principles of Learning, students may be alternatively assessed in ways that people can display knowledge and subject mastery. The alternative assessment can be storytelling, art or other expressions of self, knowing and learning.

- Learning is holistic, reflexive, reflective, experimental, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).
- Learning involves patience and time.
- Learning involves recognizing the consequences of one's actions.
- Learning is embedded in memory, history and story.

Assessment:

Formative (30%)

Self-Assessment
Core Competencies
Big Ideas
Project and Presentation
Attendance, class participation

Summative: (70%)

Test and Quizzes
(of Curricular Competencies)
Labs and Reports
Midterm Exam
Final Exam

Expectations: Attendance in the classroom is mandatory. Students are expected to use their electronics responsibly, speak English, and participate in daily activities. Students will take an active role by discussing, doing work, working in partners or groups, and taking notes. Students are responsible for any missed assignments.