



SYLLABUS

CATALOG DESCRIPTION

This is the lecture component of a lab science course for non-science majors. When taken together with the lab course PHYS-121L, it fulfills the requirements for an Associate of Arts Degree. This course will not fulfill the lab science requirements for an Associate of Science Degree. Topics include but are not limited to: classical physics, mechanics, heat, sound, optics, electricity, magnetism, and modern physics.

Prerequisites: Take MATH 096 and (RDNG 095 or RDNG 096) or obtain appropriate MATH and RDNG Accuplacer scores.

Semester Offered: Fall and Spring

Common Student Learning Outcomes

Upon successful completion of San Juan College programs and degrees, the student will demonstrate competency in...

BROAD AND SPECIALIZED LEARNING

Students will actively and independently acquire, apply, and adapt skills and knowledge with an awareness of global contexts.

CRITICAL THINKING

Students will think analytically and creatively to explore ideas, make connections, draw conclusions and solve problems.

CULTURAL AND CIVIC ENGAGEMENT

Students will act purposefully, reflectively, and ethically in diverse and complex environments.

EFFECTIVE COMMUNICATION

Students will exchange ideas and information with clarity in multiple contexts.

INFORMATION LITERACY

Students will be able to recognize when information is needed and have the ability to locate, evaluate, and use it effectively.

INTEGRATING TECHNOLOGIES

Students will demonstrate fluency in the application and use of technologies in multiple contexts.

Student work from this class may be randomly selected and used anonymously for assessment of course, program, and/or institutional learning outcomes. For more information, please refer to the Dean of the appropriate School.

Course Learning Outcomes

Upon successful completion of the course, the student will be able to...

1. Describe the process of scientific inquiry.
2. Solve problems scientifically.
3. Communicate scientific information.
4. Apply quantitative analysis to scientific problems.
5. Apply scientific thinking to real world problems.

The student should also have a basic understanding of the following topics:

1. Mechanics.

2. Sound and waves.
3. Properties of matter and fluids.
4. Electricity and magnetism.
5. Heat.
6. Light.

Specific Learning Outcomes

Upon successful completion of the course, the student will be able to...

1. Apply Newton's laws to common static and dynamical systems.
2. Define conservation of energy, momentum, charge, and mass.
3. Calculate the amount of work a person does in performing simple exercises.
4. Distinguish between power and energy.
5. Locate the center of mass of an object.
6. Determine if a material is elastic or inelastic.
7. Explain the difference between force and torque.
8. Explain the apparent weightlessness of astronauts in orbit.
9. Perform unit conversions such as converting meters to feet.
10. Describe the difference between a solid, gas, and liquid.
11. Calculate the density of different types of objects such as wood or gold.
12. Explain how an object floats.
13. Differentiate between heat and temperature.
14. Distinguish between materials of high and low heat capacity.
15. Use thermodynamics to explain the behavior of weather.
16. Identify materials that provide good thermal insulation for a home. Conversely, identify materials that provide poor thermal insulation for a home.
17. Calculate the wavelength, frequency, and speed of a wave.
18. Explain how a standing wave differs from a traveling wave.
19. Discuss the difference between constructive and destructive interference.
20. Provide examples of naturally occurring resonant systems.
21. Explain the principles behind sound propagation.
22. Solve Coulomb's law for simple charge configurations.
23. Discuss the difference between electrical insulators and electrical conductors.
24. Explain the relationship between electricity and magnetism.
25. Explain how an electric motor works.
26. Discriminate between diffraction and refraction.
27. Explain the optical difference between a concave and convex lens.
28. Discuss the basic structure of the atom.