

SYLLABUS - Spring 2006

1. Introduction -

- Exploration of Nature, Science –
A Way of Knowing
- Fundamental quantities
- Measurement units
- Scales of distances

2. The Newtonian Universe

- Vectors, Scalars
- Motion - distance, velocity, acceleration
- Force - static, net
- Mass, momentum, impulse
- Newton's Laws of Motion
- Gravity -force, acceleration, weight, weightlessness

3. Energy and Matter

- Matter - States of Matter
- Energy, Work
- Law of Conservation of Energy
- Forms of Energy
- Transformation of energy
- Power
- Heat, Temperature
- Transfer of heat - Conduction, Convection,
Radiation, Change of state of matter
- Gases - gas laws, Boyle, Charles, General
- First Law of Thermodynamics
- Diffusion of gases
- Archimedes' Principle
- Bernoulli Effect

4. Exploring the Universe

Wave Motion

- Waves, Properties of Waves
- Standing Waves,

- Resonance, Interference, Beats

Sound

- Pitch vs. Frequency,
- Loudness vs. Intensity
- Timbre vs. Harmonics

Light

- Electromagnetic Spectrum - Color
- Refraction, Reflection
- Polarization
- Doppler Effect
- Lenses and Mirrors, Optical Instruments
- Scattering - Blue Sky - Red Sunsets
- Rainbows
- Atmospheric Pollution

Radiation

- Black Body, Planck's Law
- Wien's and Stefan's Laws

5. Electricity and Magnetism

- Electrostatics
- Fields and Potential, Energy and Power
- Electrical units: Volt, Ampere, Ohm
- Circuits - Series and Parallel
- Magnetism
- Electric Currents and Magnetic Fields
- Motors, Generators, Transformers
- Power Distribution

6. The Material World

- Particles of Matter – Atoms, Atomic Structure
- Atomic Spectra – Hydrogen Atom
- What is Inside the Atom?
- The Nucleus – Geochronology, Stability,
- Radioactivity,
- Fission, Fusion
- Energy of the Future

SPRING 2006 — HOMEWORK PROJECT

Select an article from the newspaper or a news magazine dealing with **science** and its relationship with society, that is, with the environment, weather, global warming, space exploration, health, dna, genetic engineering, etc.

Articles dealing with purely social issues will not be accepted.

Write a report on the article. The report must contain:

1. Title of the article.
2. Name of publication (Dallas Morning News, New York Times, Time, Newsweek. Reports from the internet are acceptable.)
3. Date of publication.
4. A paragraph of two or three sentences on the main theme of the article and how it relates to a current science issue.
5. Your name and assigned seat number in the upper right hand corner.

Attach a copy of the article to the report. Please **staple** the article to the report before coming to class. We do not have a stapler in class.

Reports are due every Tuesday starting on January with the last one due on April 19.

Late reports will not be accepted. A report is considered **late** if not handed in by the end of class (10:45 am) on the date due.