Course Description
In this course the student learns to apply some of the basic laws of physics as they relate to construction, and to problems in buildings and other structures; particularly the effects of loads, stress, bending, moisture and temperature changes, acoustics and electrical theory.

Suggested Prerequisites:
- Physics 11 or equivalent
- Algebra 11 or equivalent

Learning Outcomes
The student will be able to:
1. Comprehend and apply the fundamental terms, principles and laws of physics as they relate to construction and to applications and problems in buildings and other structures.
2. Analyze and solve simple practical problems in buildings and other structures involving:
   a. Measurements of physical conditions
   b. Loads on structures including:
      - Stress
      - Shear & Moment Calculation
      - Deflection
      - Elastic Buckling of Columns
   c. Principles of Trusses
   d. Moisture penetration and effects
   e. Heat losses and gains; solar energy
   f. Thermal movements in natural and other materials
   g. Principles of Acoustics
   h. Principles of electricity

Course Content:
STATICS
1. Statics: forces represented as vectors, their resultants and reactions;
2. Equilibrium of Concurrent Forces; Moments and Couples; Two Force Members
STRUCTURAL PROPERTIES OF AREAS
1. Centre of gravity, centroids, moments of inertia, Parallel Axis, Radius of Gyration
STRESS & STRAIN
1. Types of Stress; Stress versus Strain
2. Shear and bending moments
3. Flexural Stresses; Shearing Stresses
4. Deflection
TRUSSES
1. Analysis by joint equilibrium
2. Method of sections
3. Special types
HEAT & MOISTURE (from Chapters 2 & 4 of Mechanical and Electrical Equipment for Buildings)
1. Temperature and thermal expansion and conduction;
2. Thermal insulation; Condensation and weatherproofing.
ACOUSTICS (from Chapter 26 of Mechanical and Electrical Equipment for Buildings)
1. Properties of sound waves, absorption and refraction
2. Measurement of Sound
3. Insulation of sound
4. Airborne and structural sound
Course Content:
  ELECTRICAL PRINCIPLES (from Chapter 14 (14.1 - 14.15) of Mechanical and Electrical Equipment for Buildings)
  1. Electric energy, units of measurement
  2. Direct Current & Alternating current
  3. Electrical Circuits & demand
  4. Energy management systems

Required Textbooks and Materials:
  1. Elementary Structures for Architects and Builders, by R.E. Schaffer.

Testing:
  1. Emphasis in testing will be on the problem solving abilities of the student.