MEC 104

Practical Science

Fall 2011

**Catalog Data:** MEC 104: Practical Science. Credit 3. A practical introduction to the science and engineering of objects and phenomena in everyday life. The basic principles that underlie the operation common to modern devices such as roller coasters, balloons, vacuum cleaners, airplanes, bicycles, thermostats, air conditioners, and automobiles are developed by investigating how they work. Issues of design, safety, and environmental impact are also discussed.


**Instructor:** Professor Juldeh Sesay, Department of Mechanical Engineering
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Room 226 Heavy Engineering, 2-8493
office hours: Tuesdays and Thursdays 1:00-2:00 PM or by appointment

**Goals:**

1. acquire an understanding of basic science and engineering as they are manifest in the operation of every day technologies;

2. learn to think logically in order to solve problems;

3. develop and expand physical intuitions;

4. learn how things work.

**Topics:**

1. The Laws of Motion, I
   1.1 Skating
   1.2 Falling Balls
   1.3 Ramps

2. The Laws of Motion, II
   2.1 Seesaws
   2.2 Wheels
   2.3 Bumper Cars

3. Mechanical Objects
3.1 Spring Scales
3.2 Bouncing Balls
3.3 Carousels and Roller Coasters
3.4 Bicycles
3.5 Earth, Sun, and Moon

4. Fluids
4.1 Balloons
4.2 Water Distribution
4.4 Elevators

5. Fluids and Motion
5.1 Garden Watering
5.2 Balls and Frisbees
5.3 Airplanes and Rockets
5.4 Vacuum Cleaners

6. Heat and Thermodynamics
6.1 Woodstoves
6.2 Incandescent Light Bulbs
6.3 Air Conditioners
6.4 Automobiles
6.7 The Atmosphere

7. Resonance and Mechanical Waves
7.1 Clocks
7.2 Violins and Pipe Organs

Computer Usage: minimal
Laboratory Projects: None
Grades: Best 3 (out of 4) exams (25% each)
8 Class quizzes (of 25 % each)
PLUS extra credit work (10%)

Revised 8/30/11