

**Homework for 16.00**  
**Introduction to Aerospace Engineering and Design**

**Problem Set #1**

**Problems 1 and 2. Answer any two questions from Problems 1.1, 1.2, 1.3, or 1.4 with a one paragraph or less answer. (10 points each)**

1.1 In a few sentences describe the Montgolfiers' contribution to flight.

1.2 In a few sentences discuss the advent of dirigibles and the responsible inventors. Speculate on why we don't see blimps that carry hundreds of people flying today?

1.3 What was the critical aerodynamic contribution that the Wright Brothers implemented in order to achieve the first heavier-than-air flight?

1.4 List two women pioneers of aviation and their accomplishments.

**Problem 2.4 (16 points)** From the employer's desired attributes checklist, select and explain two categories for which you feel your education will best prepare you. Also select and explain two categories for which you feel your education will least prepare you and which might require some self-study.

**Problem 2.6 (14 points)** Select your favorite aerospace-related cartoon and turn it in with this problem. In a few sentences, describe any technological validity of the cartoon and/or any technical misconceptions. Describe the social implications for the aerospace field as well as aerospace engineers briefly.

**Problem 12.1 (50 points, 10 points possible extra credit) Arthur Ganson's designs**

*We read objects in motion on both the objective and subjective levels. A machine may be about fabric or grease, but it may also be about thick liquid and sensuous movement. A bit deeper, it may be about meditation or the sense of release. And taken yet another step, it may be about pure invention and the joyfulness in the heart of its creator. (Arthur Ganson).*

Sculptor/inventor Arthur Ganson's whimsical mechanical sculptures can be seen in person at the MIT museum and embody the qualities least associated with machines. Self-described as "a cross between an engineer and a choreographer", Ganson creates contraptions composed of a range of materials from delicate wire to welded steel and concrete. Most are viewer-activated or driven by electric motors. All are driven by a wary sense of humor or a probing philosophical concept. "When making a sculpture," Ganson says, "it's always a challenge to say enough but not say too much, to coax with some kind of recognizable bait, then leave the viewer to draw his or her own conclusions and thereby find personal meaning."

Watch the video of Arthur Ganson's design and sculpture (Ganson.mov) on this textbook's accompanying CD-ROM. In no more than two pages, critique one of Ganson's sculptural engineering designs that fascinated you. Sketches are most welcome. Provide the following in your critique:

- (a) An introduction to the specific design you have chosen.
- (b) A discussion of how you think it works, mechanically or electrically.
- (c) A discussion of what you think of the aesthetics of the design.
- (d) Recommendations you have to change or enhance your chosen design.
- (e) A summary statement about how Arthur Ganson's designs will affect your own engineering designs.

**Extra Credit:** Walk to the MIT Museum and view Ganson's sculptures in person and answer the above questions for a design that is at the museum, but not included in the Ganson.mov file.