Lecture # 12
- Descriptive Geometry problems
- The Semester Project
Announcement

• Go to your *preferred* Lab Sections this week
• Formation of Project Teams
HW #6

• Submit project sketches, one set per team
  – make sure everyone’s name is on it

• Some basic descriptive geometry problems.
  – Solve using AutoCAD and graphical techniques.
More descriptive geometry...

- Check out the step-by-step examples on the Graphics Interactive tutorials.
True Length of a Line
Other Neat Facts…

• Perpendicular lines appear perpendicular when one is shown in its true length
• A point view of a line is seen in a view that is created perpendicular to its true length
• The point view of any line in a plane shows that plane in an edge view
• A view created parallel to an edge view of the plane shows that plane in its true shape
• The dihedral angle between two planes is shown when their intersection is in point view
Auxiliary Views

(True shape)
Typical Problem...

What is the true shape of the plane?
Intersection of a Line and a Plane

• What is the true angle of intersection? What view is required?
• Ans: Edge view of the plane and true length of the line
The Dihedral Angle

- This is the true angle between two intersecting planes
- The intersection of two planes is a line
- The dihedral angle can be observed by creating the point view of this intersection line
The Dihedral Angle

• The dihedral angle solved the problem of pre-cutting of materials which intersect at odd angles, i.e. timber or metal support structures, frames
Find the angle between planes ABC and ABD
Semester Project

- Design “Deploy It” device
- Project #4 in Chapter 5
- Build it
- Demonstrate it
- Document it
- Work in teams
Semester Project

• Demonstrations in Lab, last week of class
• Drawings due Monday, 11 May, 5 PM
• Worth 20% of course points
Project Highlights

• Self-deploying boom
• Extends horizontally without touching the ground
• Performance measured by distance travelled horizontally
• Standard material list
• Rules
• Drawings, no written report
Teams

- 4-5 persons per team
- TA’s will form teams
- Teams organized within Lab
- Expect to meet mostly outside class
- 80% of project grade is common
- Score your teammates for the remaining 20% of the project grade.  *Contribute!*
Written Reports

• Initial Proposal Sketches (2 pages max.)
  – Due next week with HW

• Project Drawings (as many as necessary)
  – Due at the end of the semester

• Peer Evaluations
  – Submitted with final drawings
Written Reports

• Initial Proposal
  – Assigned now as HW, due next week
  – Set of conceptual sketches, 2 pages max.
    • Pictorials, no multi-view drawings
    • Use surface shading, texturing
    • Use cartooning
  – One proposal per team
Materials

- Standard material list
- Plus 100 cc of ABS plastic, geometry created on the Dimension FD printer
More Contest Rules

• Spare parts are recommended, and do not count in the material inventory of the final assembly

• No explosive devices
Required Drawings

• Conceptual Sketches
• Outline Assembly Drawings for all assemblies and sub-assemblies
• Exploded Assembly Drawings for all assemblies and sub-assemblies
• Detail Drawings for all parts
• Bill-of-Material
Scoring

- 20 points: Function, performance, and reliability of the machine.
- 20 points: Creativity and presentation
- 20 points: Perceived contribution to the group effort (Peer evaluations)
- 40 points: Accuracy and completeness of working drawings
End

• Questions?