

## Homework # 1

### CIVE311 – STRUCTURES I

Spring 2010-11

**Topics:** Review of Equilibrium/Statics  
Trusses  
Shear and Bending Moment Diagrams in Beams  
Application on SAP2000

**Textbook:** Structural Analysis, by R.C. Hibbeler  
Prentice-Hall, 5<sup>th</sup> Edition (5<sup>th</sup> Edition problems provided)

**Problems:**

- Chapter 3: 7 (Truss)  
Solve for reactions and all member forces (Note symmetry)
- Chapter 4: 12, 1, 2, 21, 16, 36, 39, 40 (Beams)  
All Problems: Compute reactions and draw V and M diagrams and sketch deflected shape  
Problem 12: Use  $P=20$  kN;  $L=3$  m  
Problem 16: Use  $P=20$  kN;  $L=2$  m  
Note: Ordering of problems is by increasing level of difficulty with SAP2000 (below).
- Solve all problems using SAP2000
  - Plot Undeformed Shape + Supports + Loads
  - Plot Deformed Shape
  - Plot Reactions
  - Plot Member Forces (Axial for Trusses, Shear and Bending for Beams)
  - **File Labeling should be consistent with your problem numbers**

**Given:** Monday February 21, 2011

**Due:** Manual Solution – Wednesday March 2, 2011  
SAP2000 Solution – Wednesday March 9, 2011

**IMPORTANT NOTES**

- Homework should be submitted on time.
- Use FE paper, staple, and submit in FEA folder.
- Homework should be clean, organized, and professional.
- Think of yourself as a professional engineer who is submitting a project (your homework) to a client (your teacher), who, if not satisfied, will not give you another job.

**If you do not satisfy the above, your homework may be returned to you without grading.**