

53:134 Structural Design II (Steel Structures)
Spring 2006 (Lecture Summary)
Week 6 (2/20 - 2/24/06)

2-20-06

- ◆ **Midterm Exam:** force method, slope-deflection method. Closed book, one handwritten formula sheet is allowed.

2/22/06

- ◆ **Discuss midterm exam.**

2/24/06

- ◆ **Matrix Methods of Structural Analysis:** Review of matrix algebra - notation.
- ◆ **Basic Idea of Displacement Method or Direct Stiffness Method:**
 - The method is a precursor to the more general method, the finite element method of analysis.
 - Write equilibrium equation for the structure in terms of generalized displacements.
 - All the loads applied to the members must be transferred to the nodes (joints).
 - Method is applicable to both determinate and indeterminate structures.
- ◆ **Overview of the Direct Stiffness Method:**
 - Equilibrium equation for a spring element.

- Two-spring example to illustrate the basic steps of the procedure.
- Equilibrium equation in terms of displacements.
- Boundary conditions.
- Solution of displacements.
- Recovery of element forces.
- ◆ **HW#11:** 6.2.1.
- ◆ **Read:** Sections 6.1 and 6.2.1.