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Lecture Outline

I. Introduction
   A. Introduction
   B. Properties and Behavior of Structural Steel, Structural Shapes (1-5 to 1-7)
   C. Loads and Structures (S-A4)
   D. Specifications and Codes
   E. LRFD Design Philosophy: First-Order Second-Moment Reliability Methods (2-5 to 2-11)

II. Tension Members
   A. Preliminary Strength Analysis (C-D1)
   B. Net Area (S-B2)
   C. Staggered Holes (S-B2)
   D. Angles
   E. Effective Net Area
   F. Design of Tension Members (S-D1)
      1. Criteria
      2. Design Procedure
   G. Summary

III. Columns
   A. Euler Buckling
      1. Strong/Weak-Axis Buckling
      2. Weak-Axis Bracing
      3. Columns in Frames
   B. Experimental Results
   C. Design Equations (S-E2)
   D. Use of Column Tables (M-3)
   E. Design Procedure
   F. Columns in Frames
      1. Design Procedure for Frames

IV. Laterally Supported Beams
   A. Yield and Plastic Moments (Virtual Work Methods)
   B. Residual Stresses
   C. Modes of Failure
   D. Local Buckling
   E. Design Equations (S-F, A-F)
   F. Check for Deflections
   G. Check for Shear (S-F2)
   H. Design Tables (M-4)
   I. Design Procedure

V. Lateral-Torsional Buckling of Beams
   A. Lateral-Torsional Buckling Shape
   B. Lateral Support
   C. Moment Gradient Factor
   D. Strength of Unbraced Beams
   E. Design Equations (S-F)
   F. Design Procedure (M-4)

VI. Combined Axial Loading and Bending
   A. Failure Modes
   B. Members Subjected to Bending and Axial Tension
   C. Primary and Secondary Moments
   D. Ultimate Strength (Yielding)
   E. Design Equations (S-H1)
      1. Summary of Compression Members
         a) Columns with Pinned Supports
         b) Columns in Frames
         c) Calculation of G_A and G_B
      2. Summary of Beams
         a) Basic Design Procedure
         b) Moment Gradient Factor, C_b
         c) Deflection Limits
         d) Web Shear Capability
         e) Moment Capacity for Local Buckling
         f) Partially Compact Sections
         g) Non-Compact Sections
         h) Moment Capacity for Lateral Torsional Buckling

VII. Design Connections
   A. Preliminaries
   B. Failure Modes
   C. Design Specifications
   D. Bolted Angles for Tension Loads
   E. Beam-to-Column Connections
   F. Beam-to-Girder Connections

VIII. Welds
   A. Preliminaries
   B. Weld Size Limitations
   C. Design Strength

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M-  = AISC Manual
S-  = Specification
C-  = Commentary
A-  = Appendix
Ex. = Example
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