- 4. Contents
- 5. Preface
- 6. MindTap Online Course
- 7. Chapter 1: Introduction
- 8. 1.1 Structural Design
- 9. 1.2 Loads
- 10. 1.3 Building Codes
- 11. 1.4 Design Specifications
- 12. 1.5 Structural Steel
- 13. 1.6 Standard Cross -Sectional Shapes
- 14. Problems
- 15. Chapter 2: Concepts in Structural Steel Design
- 16. 2.1 Design Philosophies
- 17. 2.2 American Institute of Steel Construction Specification
- 18. 2.3 Load Factors, Resistance Factors, and Load Combinations for LRFD
- 19. 2.4 Safety Factors and Load Combinations for ASD
- 20. 2.5 Probabilistic Basis of Load and Resistance Factors
- 21. 2.6 Steel Construction Manual
- 22. 2.7 Design Computations and Precision
- 23. Problems
- 24. Chapter 3: Tension Members
- 25. 3.1 Introduction
- 26. 3.2 Tensile Strength
- 27. 3.3 Effective Area
- 28. 3.4 Staggered Fasteners
- 29. 3.5 Block Shear
- 30. 3.6 Design of Tension Members
- 31. 3.7 Hreaded Rods and Cables
- 32. 3.8 Tension Members in Roof Trusses
- 33. 3.9 Pin-Connected Members
- 34. Problems
- 35. Chapter 4: Compression Members
- 36. 4.1 Introduction
- 37. 4.2 Column Theory
- 38. 4.3 Aisc Requirements
- 39. 4.4 Local Stability
- 40. 4.5 Tables for Compression Members
- 41. 4.6 Design
- 42. 4.7 More on Effective Length
- 43. 4.8 Torsional and Flexural-Torsional Buckling
- 44. 4.9 Built-Up Members
- 45. Problems
- 46. Chapter 5: Beams
- 47. 5.1 Introduction
- 48. 5.2 Bending Stress and the Plastic Moment
- 49. 5.3 Stability

- 50. 5.4 Classification of Shapes
- 51. 5.5 Bending Strength of Compact Shapes
- 52. 5.6 Bending Strength of Noncompact Shapes
- 53. 5.7 Summary of Moment Strength
- 54. 5.8 Shear Strength
- 55. 5.9 Deflection
- 56. 5.10 Design
- 57. 5.11 Floor and Roof Framing Systems
- 58. 5.12 Holes in Beams
- 59. 5.13 Open-Web Steel Joists
- 60. 5.14 Beam Bearing Plates and Column Base Plates
- 61. 5.15 Biaxial Bending
- 62. 5.16 Bending Strength of Various Shapes
- 63. Problems
- 64. Chapter 6: Beam-Columns
- 65. 6.1 Definition
- 66. 6.2 Interaction Formulas
- 67. 6.3 Methods of Analysis for Required Strength
- 68. 6.4 The Moment Amplification Method
- 69. 6.5 Braced versus Unbraced Frames
- 70. 6.6 Members in Braced Frames
- 71. 6.7 Members in Unbraced Frames
- 72. 6.8 Design of Beam-Columns
- 73. 6.9 Trusses with Top-Chord Loads Between Joints
- 74. Problems
- 75. Chapter 7: Simple Connections
- 76. 7.1 Introduction
- 77. 7.2 Bolted Shear Connections: Failure Modes
- 78. 7.3 Bearing Strength, Spacing, and Edge-Dis tance Requirements
- 79. 7.4 Shear Strength
- 80. 7.5 Installation of High-Strength Bolts
- 81. 7.6 Slip-Critical and Bearing-Type Connections
- 82. 7.7 Design Examples
- 83. 7.8 High-Strength Bolts in Tension
- 84. 7.9 Combined Shear and Tension in Fasteners
- 85. 7.10 Welded Connections
- 86. 7.11 Fillet Welds
- 87. Problems
- 88. Chapter 8: Eccentric Connections
- 89. 8.1 Examples of Eccentric Connections
- 90. 8.2 Eccentric Bolted Connections: Shear Only
- 91. 8.3 Eccentric Bolted Connections: Shear Plus Tension
- 92. 8.4 Eccentric Welded Connections: Shear Only
- 93. 8.5 Eccentric Welded Connections: Shear Plus Te nsion
- 94. 8.6 Moment-Resisting Connections
- 95. 8.7 Column Stiffeners and Other Reinforcement

- 96. 8.8 End Plate Connections
- 97. 8.9 Concluding Remarks
- 98. Problems
- 99. Chapter 9: Composite Construction
- 100. 9.1 Introduction
- 101. 9.2 Shored versus Unshored Construction
- 102. 9.3 Effective Flange Width
- 103. 9.4 Steel Headed Stud Anchors
- 104. 9.5 Design
- 105. 9.6 Deflections
- 106. 9.7 Composite Beams with Formed Steel Deck
- 107. 9.8 Tables for Composite Beam Analysis and Design
- 108. 9.9 Continuous Beams
- 109. 9.10 Composite Columns
- 110. Problems
- 111. Chapter 10: Plate Girders
- 112. 10.1 Introduction
- 113. 10.2 General Considerations
- 114. 10.3 AISC Requirements for Proportions of Plate Girders
- 115. 10.4 Flexural Strength
- 116. 10.5 Shear Strength
- 117. 10.6 Bearing Stiffeners
- 118. 10.7 Design
- 119. Problems
- 120. Appendix: Plastic Analysis and Design
- 121. A.1 Introduction
- 122. A.2 AISC Requirements
- 123. A.3 Analysis
- 124. A.4 Design
- 125. References
- 126. Answers to Selected Problems
- 127. Index