Unified Design of Steel Structures, 2nd edition, presents a fresh look at steel design that is based, from its inception, on the concepts used by the Specification Committee to develop the unified provisions.

The text is designed primarily for use in a single course in basic steel design, but may also be used in a second, building oriented course in steel design, depending on the coverage in the first course.

This text is based on the 2010 AISC Specification for Structural Steel Buildings. It addresses in a consistent way both LRFD and ASD design philosophies. It is designed to be used with the 14th edition of the Steel Construction Manual and is directly linked to it with discussions of numerous Manual Tables after the Specification equations have been addressed. This approach gives the student the advantage of knowing what primary resources are available in the Manual and how to use them. Each Chapter starts with a table indicating which sections of the Specification and which Parts of the Manual are to be discussed to assist the student with an understanding of the breadth of topics covered in that chapter.

All examples that rely on LRFD and ASD provisions are fully presented, even if it means some duplication, so that regardless of approach being taught, there will be no need to refer to the other approach example. All homework problems that could be LRFD or ASD are presented both ways so that the instructor may choose the approach they want the student to follow.

Salient Features

Example Problems for ANSI/AISC 360-10: All examples have been updated to the new specification and the new table of member properties, as well as being revised to improve clarity of intent.

New Homework Problems: 60% more homework problems have been added, including problems that carry over from one chapter to another so that an opportunity exists to link concepts of design to one or two specific structures.

Integrated Design Project: A building is presented in Chapter 1 that is used as an Integrated Design Project throughout the book. This project is different from typical homework problems in that it is a relatively open-ended design project. The Integrated Design Project is available in Chapters 2, 4, 5, 6, 8, 9, 11, 12, and 13. It is presented at the end of the Homework Problems.

AISC Resources: Chapter 1 has been expanded to include discussion of the three main resources published by AISC that are used throughout this book, the Specification, the Manual, and the AISC web site. It also expands the discussion of reliability and shows that reliability for ASD and LRFD each vary with live-to-dead load ratio although LRFD varies a bit less than ASD.

Other changes: All Problems use ASCE 7-10, including new load combinations and approach for determination of wind loads. Chapter 3 addresses changes in ASTM requirements for A992 steel and a new grade of steel for HSS. Chapter 4 uses the new minimum shear lag factor. Chapter 5 addresses torsional restraint at beam supports, new provisions for negative moment redistribution and the new provisions for stem local buckling of tees. New Tables for Small Compression Members are provided for use with chapter 6. Chapter 7 adds coverage of concentrated loads on beam webs and stiffeners. Chapter 11 now addresses beam bearing plates.

Second-order Effects and Direct Analysis Discussion Expanded: Chapter 8 has seen the greatest revision as new discussion has been included to address the requirements for inclusion of second-order effects and these second-order effects are better integrated into the examples. The revised requirements for use of an amplified first-order analysis are presented. Discussion is expanded on the direct analysis method, the effective length method and the first-order analysis method and an example has been included to address the direct analysis method. A section on combined tension and bending has also been added.

New Column and Shear Anchor Provisions: Chapter 9 reflects the changes made in the corresponding Chapter I of the Specification.

New Bolt Strength Used Throughout: Chapters 10, 11, and 12 have been updated to reflect the changes in bolt shear strength and strength of slip critical connections.

New organization of Seismic Provisions for Structural Steel Buildings: Chapter 13 has been revised to reflect the new organization of ANSI/AISC
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