Preface

Digital Electronics: Principles and Applications, eighth edition, is an easy-to-read introductory text for students new to the field of digital electronics. Providing entry-level knowledge and skills for a wide range of occupations is the goal of this textbook and its ancillary materials. Prerequisites are general math and introductory electricity/electronics. Binary math, Boolean concepts, simple programming, and various codes are introduced and explained as needed. Concepts are connected to practical applications, and a systems approach is followed that reflects current practice in industry. Earlier editions of the text have been used successfully in a wide range of programs: electronic technology, electrical trades and apprenticeship training, computer repair, communications electronics, and computer science, to name a few. This concise and practical text can be used in any program needing a quick and readable overview of digital principles.

New to this Edition

Chapter 1

- Digital applications, including automotive fuel indicators, vehicle speed sensors, and engine control module.
- A new section on where digital circuit applications are used.
- Information on logic probe use in troubleshooting.
- A revised instruments section.

Chapter 2
- Subsection on applications of encoders and decoders.

Chapter 3

- Updated information on practical chips including lower voltage ICs.
- Expanded most self-test sections.

Chapter 4

- Expanded several self-test sections.
- Revised material on data selectors.

Chapter 5

- Information on low-voltage ICs.
- Added many application assignments on interfacing.

Chapter 6

- Updated applications of the Gray code, including the shaft encoder, and new information on the quadrature encoder.
- Updated information on display technologies.

Chapter 7

- Application of an R-S latch.
- A new detailed application of a latched encoder-decoder system.

Chapter 8
- Expanded self-test questions.

Chapter 10

- Expanded several self-tests.
- Updated binary subtraction section.

Chapter 11

- Updated overview of memory section.
- Updated nonvolatile read/write memory section
- Updated memory packaging section.
- Expanded bulk storage section, including more information on USB flash drives.
- Internet research topics.

Chapter 12

- Expanded self-test and critical thinking questions.
- Information on distance sensing with coverage of several sensor technologies.
- A DIY application demonstrating a distance sensor triggering the timed operation of a stepper motor.

Chapter 13

- Updated microcomputer section.
- Updated data transmission section.

- A revised microcontrollers section.
- Application of a microcontroller with photo input and servo motor output.

Chapter 14

- Expanded self-test questions.

Additional Resources

An *Experiments Manual* for *Digital Electronics* contains a comprehensive test, a variety of hands-on lab exercises and experiments, and additional problems for each chapter in the textbook.

The **Online Learning Center** (OLC) at **www.mhhe. com/tokheim8e** includes comprehensive Multisim files, keyed to circuits found in the eighth edition, and a Multisim primer (written by Patrick Hoppe of Gateway Technical College), which provides a tutorial on the software for new users. The Multisim program itself is not included on the website, but the latest version, version 12, can be purchased through McGraw-Hill at a discount when you adopt this textbook. Visit **www.mhhe.com/tokheim8e** or contact your McGraw-Hill sales representative for more information.

The OLC also features chapter study resources, links to industry and association sites, and assignments and tests for students. Instructors can access the instructor side of the OLC to find a wide selection of information including:

- An Instructor's Manual that includes a list of the parts and equipment needed to perform lab experiments, learning outcomes for each chapter, answers to chapter review questions and problems, and more.
- PowerPoint presentations that correlate to all chapters and special PowerPoint presentations on breadboarding, soldering, circuit interrupters (GFCI and AFCI), and instrumentation.
- A test generator, EZ Test, which includes a test bank with questions for each chapter.