

# Preface

*Electronic Principles*, seventh edition, continues its tradition as a clearly explained, in-depth introduction to electronic semiconductor devices and circuits. This textbook is intended for students who are taking their first course in electronic circuits. The prerequisites are a DC/AC Circuits course, algebra, and some trigonometry.

*Electronic Principles* provides essential understanding of semiconductor device characteristics, testing, and the practical circuits in which they are found. The text provides clearly explained concepts—written in an easy-to-read conversational style—establishing the foundation needed for understanding the operation and troubleshooting of electronic systems. Practical circuit examples are found throughout the chapters.

## New to This Edition

Based on the feedback from extensive reviewing and course research, the seventh edition of *Electronic Principles* contains enhanced material on a variety of electronic devices and circuits, including:

- additional PNP transistor coverage,
- basic Bipolar Junction Transistor (BJT) voltage-divider circuit design
- increased ac load line analysis of BJT power amplifiers
- power E-MOSFET and D-MOSFET biasing
- Insulated Gate Bipolar Transistors (IGBTs)
- R/2R ladder D/A converters
- Function generator integrated circuits
- Class-D amplifiers

Starting in Chapter 1, “Introduction,” the **T-shooter** troubleshooting exercise feature has been simplified for easier student use and understanding. This practical feature is integrated throughout the remaining chapters. In Chapter 2, “Semiconductors,” one of many “**Summary Tables**” has been added to provide concept reinforcement and a convenient information resource. Starting in Chapter 3, “Diode Theory,” **data sheets** for specific semiconductor devices will be found within the chapter as they are discussed. Chapters 4 through 6 have additional content regarding the testing of diodes and transistors using DMMs, VOMs, and semiconductor curve tracers. While Chapter 10, “Voltage Amplifiers,” retains its coverage of the common-emitter (CE) amplifier, Chapter 11, “CC and CB Amplifiers,” focuses on common-collector (CC) or emitter follower, common-base (CB), and Darlington amplifier configurations. Chapter 12, “Power Amplifiers,” has been modified to include class A, B, AB and C power amplifiers, along with additional ac load line analysis. In Chapter 13, “JFETs,” modifications have been made to the order of JFET biasing and biasing techniques. In Chapter 14, “MOSFETs,” depletion-mode and power enhancement-mode MOSFET amplifiers have been added along with MOSFET testing. Chapter 15, “Thyristors,” includes more detail in RC phase-shift control, SCR testing, and introduces IGBTs. Frequency analysis of FET stages has been added to Chapter 16, “Frequency Effects.” In Chapter 20, “Linear Op-Amp Circuits,” the circuit operation of the R/2R ladder D/A converter has been included. Chapter 22, “Nonlinear Op-Amp Circuits,” now includes the basic operation of a class-D amplifier. Also, Chapter 23, “Oscillators,” has an additional section on function generator ICs, including the XR-2206.