

*This page intentionally left blank.*

[For more information about this title, click here.](#)

---

# CONTENTS

---

**Preface**    *xiii*  
**Acknowledgments**    *xix*

## **PART 1 Digital Fundamentals**

### **Chapter 1 Digital Logic** ..... **3**

- 1.1 Boolean Logic / 3
- 1.2 Boolean Manipulation / 7
- 1.3 The Karnaugh map / 8
- 1.4 Binary and Hexadecimal Numbering / 10
- 1.5 Binary Addition / 14
- 1.6 Subtraction and Negative Numbers / 15
- 1.7 Multiplication and Division / 17
- 1.8 Flip-Flops and Latches / 18
- 1.9 Synchronous Logic / 21
- 1.10 Synchronous Timing Analysis / 23
- 1.11 Clock Skew / 25
- 1.12 Clock Jitter / 27
- 1.13 Derived Logical Building Blocks / 28

### **Chapter 2 Integrated Circuits and the 7400 Logic Families** ..... **33**

- 2.1 The Integrated Circuit / 33
- 2.2 IC Packaging / 38
- 2.3 The 7400-Series Discrete Logic Family / 41
- 2.4 Applying the 7400 Family to Logic Design / 43
- 2.5 Synchronous Logic Design with the 7400 Family / 45
- 2.6 Common Variants of the 7400 Family / 50
- 2.7 Interpreting a Digital IC Data Sheet / 51

### **Chapter 3 Basic Computer Architecture** ..... **55**

- 3.1 The Digital Computer / 56
- 3.2 Microprocessor Internals / 58
- 3.3 Subroutines and the Stack / 60
- 3.4 Reset and Interrupts / 62
- 3.5 Implementation of an Eight-Bit Computer / 63
- 3.6 Address Banking / 67
- 3.7 Direct Memory Access / 68
- 3.8 Extending the Microprocessor Bus / 70
- 3.9 Assembly Language and Addressing Modes / 72