

Contents :

Part I — Digital Integrated Circuits

1. **Introduction to Integrated Circuits**
 - Semiconductor fundamentals
 - Integrated-circuit technologies
 - Digital IC characteristics
2. **Logic Families**
 - RTL and DTL logic
 - TTL circuits
 - MOS logic
 - Logic compatibility
3. **Combinational Logic Circuits**
 - Logic gates
 - Boolean algebra
 - Encoders and decoders
 - Multiplexers
4. **Sequential Logic Circuits**
 - Flip-flops
 - Registers
 - Counters
 - Timing and control circuits
5. **Memory and Storage Circuits**
 - Semiconductor memory
 - Read-only memory
 - Data storage techniques
6. **Pulse and Switching Circuits**
 - Multivibrators
 - Pulse shaping
 - Switching applications

Part II — Operational Amplifier Circuit Design

7. **Operational Amplifier Fundamentals**
 - Differential amplifiers
 - Feedback principles
 - Ideal and practical op-amps
8. **Linear Amplifier Applications**
 - Inverting and noninverting amplifiers
 - Summing amplifiers
 - Integrators and differentiators
9. **Active Filters and Oscillators**
 - Frequency-selective circuits
 - RC active filters
 - Waveform generators
10. **Comparator and Regulator Circuits**
 - Voltage comparators
 - Reference circuits
 - Voltage regulators

11. Instrumentation and Signal Conditioning

- Measurement amplifiers
- Sensor interfaces
- Noise reduction techniques

Part III — Optoelectronic Circuit Design

12. Introduction to Optoelectronics

- Optical semiconductor devices
- Light emission and detection
- Photoelectric effects

13. Light-Emitting Devices

- LEDs
- Infrared emitters
- Display applications

14. Photodetectors and Photosensitive Devices

- Photodiodes
- Phototransistors
- Light sensors

15. Optical Couplers and Isolation Circuits

- Optocouplers
- Signal isolation
- Interface protection

16. Optoelectronic Applications

- Optical communication links
- Display systems
- Industrial sensing systems

Appendices

- Semiconductor data tables
- Integrated-circuit specifications
- Design equations
- Application notes
- Index