

# Computer Organization and Design Fundamentals

*Computer Organization and Design Fundamentals* takes the reader from the basic design principles of the modern digital computer through to a top-level examination of its architecture. This book can serve either as the textbook to an introductory course on computer hardware or as the basic text for the aspiring geek who wants to learn about digital design tools.

Topics covered include:

## Digital Fundamentals

- Digital Signals
- Sampling Theory
- Numbering Systems
- Binary Arithmetic
- Floating Point Binary
- Combinational Logic
- Boolean Algebra

## Design Tools

- Simplification
- Karnaugh Maps
- Error Detection/Correction
- Basic Memory Cells
- State Machines

## System Architecture

- Processor Bus
- Memory Hierarchy
- Hard Drives
- Cache RAM
- Serial Protocols
- Processor Architecture
- Memory Mapped I/O
- Interrupts
- DMA
- Assembly & Machine Language
- Intel 80x86 Basic Architecture
- Intel 80x86 Assembly Language



These topics are addressed using practical terms and examples as opposed to the purely theoretical or technical approaches favored by textbooks of the past. The aim of this book is to provide anyone who works with computer systems the ability to use the computer more effectively through a better understanding of its design.

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*Examining Computer Hardware  
from the Bottom to the Top*



David Tarnoff

Revised First Edition