

Short Summary of Key Features:

- Flexible and selectable level of coverage
- Rigor AND Intuition
- Complete solutions to exercises
- CD Includes PSPICE and over 100 simulation examples, Including SPICE, Matlab, Mathematica, and Excel
- Comprehensive introductory coverage of solid-state device operation
- Equal treatment of FET and bipolar transistors

Key Features:

- **Flexibility** - You can cover either FET or Bipolar transistors first. You can cover analog or digital material first. You can cover op-amps, CAD tools, devices physics, and device fabrication if and when you choose.
- **Selectable level of coverage** - The material on major topics is broken into sections that build on each other so the instructor can choose the level of coverage; a brief introduction or an advanced treatment.
- **Rigor AND Intuition** - The text combines a rigorous approach to circuit design with the intuition needed to fully understand and use the concepts.
- **Complete solutions** to the exercises are provided at the end of each chapter, not just the answers.
- **Feedback** is treated in a rigorous, yet intuitively reasonable way. Starting from ideal block-diagram analysis, the assumptions are removed one at a time in a way that has proven successful in the classroom.
- Comprehensive introductory coverage of **solid-state device operation** - a treatment suitable for use as an introductory device physics course. Can be used as a part of a transistor-level circuits course or separately.

- The important topic of **small-signal analysis** is covered in a separate short chapter. The treatment preempts many of the problems and questions that students have when this topic is covered implicitly in the introduction to amplifiers.
- **The material is arranged topically**, rather than by device. Instead of covering the biasing and small-signal analysis of bipolar and MOSFET amplifiers in separate chapters, the material is arranged to emphasize the models and types of analysis used. FET and Bipolar transistors receive equal depth of coverage. The chapters on DC biasing, low-frequency small-signal analysis, frequency response, large-signal analysis, and transistor-level digital circuits all begin with a detailed discussion of the models appropriate for the type of analyses being considered.
- **SPICE examples** are incorporated throughout the text (along with some Matlab, Mathematica, and Excel examples), but can be easily omitted if desired. In addition, a separate chapter covers the philosophy and practical use of CAD tools in general and SPICE in particular.
- Over 100 simulation files (mostly SPICE, but also Matlab, Mathematica, and Excel) are included on the accompanying **student CD**. The CD also includes the evaluation version of MicroSim DesignLab 8, which includes PSPICE, schematic capture, and the PROBE post processor). Additional CD's are available for instructors who adopt the book; one is the solutions manual and the other is the same as the student CD except that it also contains the simulation files for all end-of-chapter simulation problems.
- A separate chapter covers the **large-signal analysis** of circuits. Models are again discussed and the students are shown how to find the swing limits of an amplifier and how to approach circuit analysis when small-signal models are not appropriate. This material is increasingly important as supply voltages continue to drop.
- **Just in time presentation** of key concepts and analysis techniques in short, self-contained asides.

- Many of the asides present **practical information** (e.g., the expected variation of device parameters with temperature or process) or discussions of important ancillary topics (e.g., ground loops, distortion).
- A separate listing of the asides is provided so that, combined with their self-contained structure, they are suitable for use or review at any point in time.
- Encourages a modern device-independent understanding of circuits - circuit basics are described using a generic transistor where appropriate. Not a completely fictional or overly vague device, but a device that embodies the properties common to bipolar and field-effect transistors.
- Appendixes provide a summary of SPICE commands and syntax, and device models. Two more appendixes (on the CD) provide succinct reviews of LTI systems and two-port networks.