Electronics Lab Manual

Martin Feldman
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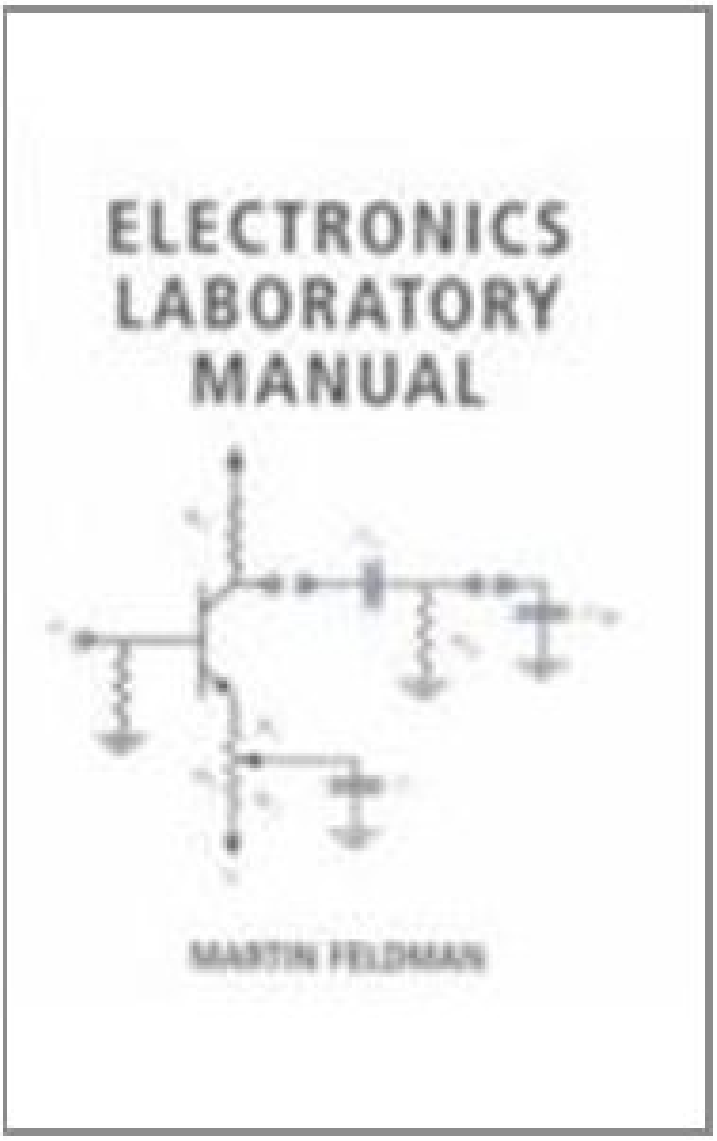

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Martin Feldman : Electronics Lab Manual before purchasing it in order to gage whether or not it would be worth my time, and all praised Electronics Lab Manual:

The emphasis is first on understanding the characteristics of basic circuits including resistors, capacitors, diodes, and

bipolar and field effect transistors. The readers then use this understanding to construct more complex circuits such as power supplies, differential amplifiers, tuned circuit amplifiers, a transistor curve tracer, and a digital voltmeter. In addition, readers are exposed to special topics of current interest, such as the propagation and detection of signals through fiber optics, the use of Van der Pauw patterns for precise linewidth measurements, and high gain amplifiers based on active loads. Chapter topics include Thevenin's Theorem; Resistive Voltage Division; Silicon Diodes; Resistor Capacitor Circuits; Half Wave Rectifiers; DC Power Supplies; Diode Applications; Bipolar Transistors; Field Effect Transistors; Characterization of Op-Amp Circuits; Transistor Curve Tracer; Introduction to PSPICE and AC Voltage Dividers; Characterization and Design of Emitter and Source Followers; Characterization and Design of an AC Variable Gain Amplifier; Design of Test Circuits for BJT's and FET's and Design of FET Ring Oscillators; Design and Characterization of Emitter Coupled Transistor Pairs; Tuned Amplifier and Oscillator; Design of Am Radio Frequency Transmitter and Receiver; Design of Oscillators Using Op-Amps; Current Mirrors and Active Loads; Sheet Resistance; Design of Analog Fiber Optic Transmission System; Digital Voltmeter.

From the Back CoverThe emphasis is first on understanding the characteristics of basic circuits including resistors, capacitors, diodes, and bipolar and field effect transistors. The readers then use this understanding to construct more complex circuits such as power supplies, differential amplifiers, tuned circuit amplifiers, a transistor curve tracer, and a digital voltmeter. In addition, readers are exposed to special topics of current interest, such as the propagation and detection of signals through fiber optics, the use of Van der Pauw patterns for precise linewidth measurements, and high gain amplifiers based on active loads. Chapter topics include Thevenin's Theorem; Resistive Voltage Division; Silicon Diodes; Resistor Capacitor Circuits; Half Wave Rectifiers; DC Power Supplies; Diode Applications; Bipolar Transistors; Field Effect Transistors; Characterization of Op-Amp Circuits; Transistor Curve Tracer; Introduction to PSPICE and AC Voltage Dividers; Characterization and Design of Emitter and Source Followers; Characterization and Design of an AC Variable Gain Amplifier; Design of Test Circuits for BJT's and FET's and Design of FET Ring Oscillators; Design and Characterization of Emitter Coupled Transistor Pairs; Tuned Amplifier and Oscillator; Design of Am Radio Frequency Transmitter and Receiver; Design of Oscillators Using Op-Amps; Current Mirrors and Active Loads; Sheet Resistance; Design of Analog Fiber Optic Transmission System; Digital Voltmeter.Excerpt. Reprinted by permission. All rights reserved. As students have told me, understanding a circuit in a textbook is one thing, making it work in the lab is another. The primary purpose of this manual is to serve as a guide through experiments that cover the major topics in electronics. It was developed for a two-semester lab course, taught in parallel with lecture courses in electronic circuits, for electrical and computer engineering majors at Louisiana State University. A second purpose is to present a compact description of electronic circuits to supplement the more complete and mathematical description found in traditional textbooks. This is intended not only as an introduction for the first time student, but also as a refresher for the professional who's been away from electronics for a while or who wishes to update his knowledge. The third, and perhaps the most important purpose, is to demystify electronics. Experiments 11 and 23, the last experiments during the first and second semesters, play a special role. In them the student constructs first a transistor curve tracer and then a digital voltmeter, both instruments with which students are familiar without knowing their inner workings. Building these instruments, using only circuitry they've already studied, they not only gain a feeling of satisfaction but grasp the lesson that they've learned enough to understand almost anything. Each experiment has descriptive introductory material, a detailed procedure, a "take home" assignment to be turned in with the completed lab report, and a page of circuit diagrams. For many students the appendix is an important first experiment, introducing them to much of the equipment and instrumentation. There are frequent questions, and many of the experiments, especially those in the second semester, have a high design content. The second-semester experiments also use PSPICE both to supplement and to check the results. The experiments are readily performed during a two-hour lab period; however, they should not be attempted "cold," and a one-hour lecture preceding the lab is recommended. Most of the experiments use an oscilloscope, digital voltmeter, power supplied (112 V adjustable, +5 V, 12.6 V ac, center tapped), and a terminal array board for rapid circuit assembly. Some experiments also use special components, e.g., light-emitting and photo diodes, conducting foam, and 7-segment displays. Several colleagues made important contributions to this manual: Pratul Ajmera, Alan Marshak, Robert Harbour, and John Scalzo. But most important were the comments from countless students, who let me know when things were wrong and encouraged me when they were right. Excerpt. Reprinted by permission. All rights reserved. As students have told me, understanding a circuit in a textbook is one thing, making it work in the lab is another. 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