PREFACE

Just as the transistor has revolutionized electronics by offering more flexibility, convenience, and reliability than the vacuum tube, the integrated circuit (IC) has enabled new applications for electronics not possible with discrete devices. Integration allows complex circuits consisting of millions of transistors, diodes, resistors, and capacitors to be included in a chip of semiconductor. This means that sophisticated circuitry can be miniaturized for use in space vehicles, computers, and other applications where large collections of discrete devices are impractical. In addition, the simultaneous fabrication of hundreds of IC chips on a single silicon wafer greatly reduces the cost and enhances the reliability of the devices.

In this course, the techniques employed in semiconductor processing will be described, and most of the lecture notes have been prepared based on the materials in the following four books:

(1) **Semiconductor Devices: Physics and Technology (2nd Edition)**, S. M. Sze, *Wiley*, 2002
(2) **VLSI Technology (2nd Editor)**, S. M. Sze (Editor), *McGraw Hill*, 1988
(3) **Solid State Electronic Devices (5th Edition)**, B. G. Streetman and Sanjay Banerjee, *Prentice Hall*, 2000
(4) **ULSI Technology**, C. Y. Chang & S. M. Sze (Editors), *McGraw Hill*, 1996

The semiconductor field is evolving quickly and new processing technologies emerge constantly. The only way to keep up with the expanding field is to read current scientific journals, periodicals, trade magazines, and news releases. The objective of the course is to provide students with sufficient background knowledge to peruse the current literature and keep abreast of the present trends in this information and technology era. **The lecture notes provided for this course are by no means sufficient, and students should refer to the text books, reference books, as well as websites for more detailed and updated materials**.

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