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1. How do you think this book is different from more recent textbooks on Microelectronics? 4. What does it mean to integrate microelectronics into a whole? Why is this important? C. H. CHAYE (1970). An introduction to

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semiconductor devices and circuits. Pergamon Press, New York. 16. Explain how the applied physics of semiconductor devices affect their fabrication. In this course, you will learn the basic integrated circuit devices like transistors, diodes, resistors, etc.

Through the use of models and experimental examples, we attempt to show how the interactions of these devices in a circuit give rise to certain electrical phenomena. The course also covers the integrated circuit fabrication techniques used in making transistors such as the diffusion technique, the MOS and bipolar technologies. At this point, you would probably be familiar

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with some of the basic integrated circuit components and processes. However, we further try to cover the most commonly used circuit components and fabrication processes such as the metal-oxide-semiconductor field-effect transistor (MOSFET) and bipolar junction transistor (BJT), CMOS gate array, standard cell, PROM, EPROM, EEPROM, SRAM and DRAM. It is expected that in the later sections of the course, you will be able to readily locate these various components and know how they are fabricated. Keep in mind that what we are trying to do is to provide you with a solid foundation on which you could carry out more detailed

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analysis. For instance, we build several examples of the CMOS logic gate using SCR and by defining the threshold voltage of the device. In this course, we employ the simulation technique to study the MOSFET behavior. We attempt to use the SIMBOLIC model to simulate the device characteristic. We also try to explain the normal phenomenon found in MOSFET. We attempt to show you how to derive the drift-diffusion equation from the Simmons model, and how the results obtained from these two models are related. The simulation has also been used to investigate the reliability problem of MOSFET. The digital simulation (DSIM) is used to

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carry out a detailed study on the basic CMOS gate. Finally, we also explain how the basic learning objectives can be achieved by the use of simulation. As the course progresses, you will learn the fabrication process of integrated circuits and the components of those circuits. In addition, we

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