

# 10020ENE 636000 Semiconductor Measurement and Characterizations

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## **COURSE DESCRIPTION:**

In this course, lessons consisting of VLSI device measurement and characterization by lectures and assigned projects, which developing students' CMOS device knowledge acquired in the previous device physics class. Students learn to know the characterization and design method of CMOS devices. They also learn to take accurate current, capacitance properties, bench measurement and test details. Extended device TCAD simulation is also performed and practiced. CMOS design rule and integration will be taught in class. New device design for layout and tape-out will be drafted for students and aspects of the new device characterization will be discussed.

## **COURSE OUTCOMES:**

Upon completing this course, students will be able to:

- Understand CMOS Integration and Design Rule
- Understand CMOS Technology, Device Layout, and Process
- Execute the TCAD Process/Device Simulation for Achieving Device Performance
- Measure and Characterize Devices Accurately
- Compare and Discuss Simulation and Measurement Results from Process and Device Physics Viewpoints
- Stress Devices to Understand the Limitation and Reliability of CMOS Devices
- Design New CMOS Device and Layout to Obtain Required Performance and Application

## **GRADING CRITERIA:**

20% - Participation

60% - Homework/Project Assignments

20% - LAB Performance