E3225 January 3:0

Art of Compact Modeling

Instructor

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Email:

Department: Electronic System Engineering

Course Time:

Lecture venue:

Detailed Course Page:

Announcements

Brief description of the course

Compact modeling, also known as SPICE modeling, acts as a bridge between device/technology community and circuit community in semiconductor industry. In this course we teach some fundamental techniques to develop compact models for metal-oxide-semiconductor based transistors.

Prerequisites

Basics of semiconductor device physics, numerical methods

Syllabus

Band theory of solids, carrier transport mechanism, P-N junction diode, MOS Capacitor Theory, C-V characteristics, MOSFET operation, Types of compact models, Input Voltage Equation, Charge Linearization, Charge Modeling, Concept of Core Model, Quasi-static and Non-quasi-static Model, Introduction to Verilog-A, Brief overview of EKV and PSP

Course outcomes

Compact modeling techniques, Verilog-A, Implementation of compact model in circuit simulator

Grading policy

equal weights for assignments, exams, projects

Assignments

Resources