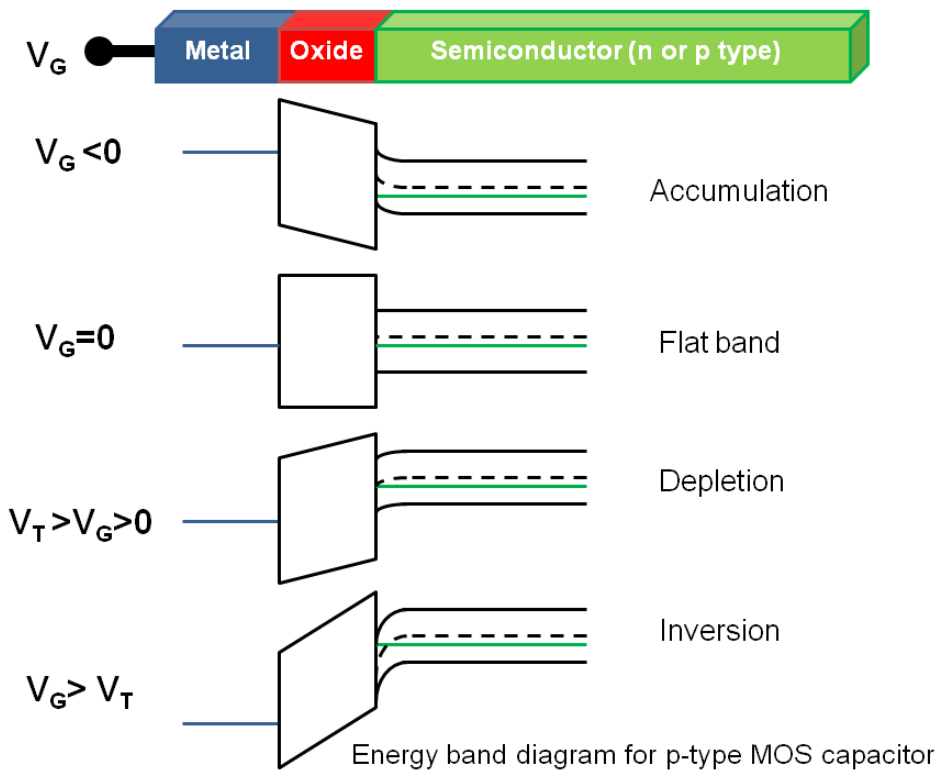
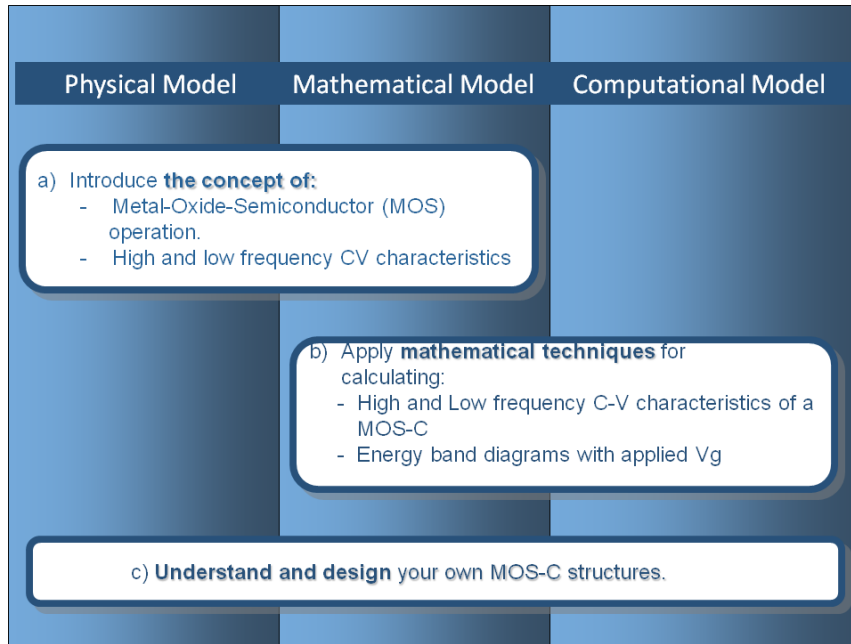


MOSCap Learning Materials



By completing the MOSCap Lab in [ABACUS - Assembly of Basic Applications for Coordinated Understanding of Semiconductors](#), users will be able to a) understand the operation of a Metal-Oxide-Semiconductor using energy band diagrams, b) study the effects of interface traps, work function, oxide thickness, etc. on capacitance-voltage output, and c) understand MOS-C C-V characteristics in low and high frequency limits.

The specific objectives of the MOSCap Lab are:



Recommended Reading

Users who are new to the operation of MOS-Caps should consult the following resources:

1. Rober F. Pierret. (1996). *Semiconductor Device Fundamentals*. Reading, MA: Addison-Wesley. (See especially chapter 16)

Demo

- * [MOSCap: First-Time User Guide](#)
- * [MOSCap Demonstration: MOS Capacitor Simulation](#)

Theoretical Descriptions

- * [Tutorial PADRE Simulation Tools.pdf](#) (tutorial)
- * [Illinois ECE 440 Solid State Electronic Devices, Lecture 31: MOS Capacitor](#)
- * [Illinois ECE 440 Solid State Electronic Devices, Lecture 32: MOS Threshold Voltage](#)
- * [Illinois ECE 440 Solid State Electronic Devices, Lecture 33: MOS Capacitance](#)
- * [ECE 606 Lecture 32: MOS Electrostatics I](#)
- * [ECE 606 Lecture 33: MOS Electrostatics II](#)

* [ECE 606 Lecture 34: MOSCAP Frequency Response](#)

* [MOS Capacitors: Theory and Modeling](#)

Tool Verification

* [Verification of the Validity of the MOSCap Tool](#)

Examples

* [MOSCAP Worked out problems \(Basic\)](#)

Exercises and Homework Assignments

1. [Exercise for MOS Capacitors: CV curves and interface and Oxide Charges](#)

2. [Exercise: CV curves for MOS capacitors](#)

Solutions to Exercises

Solutions are provided only to instructors!

Evaluation

* [ABACUS: Test for MOSCAP Tool](#)

Challenge

* [MOSCAP CV profiling](#)