**Summary**

This course aims to give a solid introduction to semiconductors, from Silicon to compound semiconductors, making the connection between the physics and their application in real life. We will explore several experimental techniques related to current semiconductor research and development.

**Content**

1. Introduction to Semiconductor Physics
2. Carrier Generation and Recombination
   - link to LEDs and Solar cells
3. Charge Transport
   - **Lab session**
   - Hall measurements
4. Non-uniformly doped semiconductors
   - Schokley equations.
5. p-n junctions
6. Metal semiconductor junctions
   - Schottky and Ohmic junctions
7. Metal Oxide Semiconductor MOSFETs
8. Semiconductor junctions (Compound semiconductors)
   - Band structure simulations
9. Semiconductor devices of today
   - High electron mobility transistors (HEMTs)
   - Power transistors

**Keywords**

Semiconductors, compound, Silicon, GaAs, GaN, transistors, LEDs, solar cells, HEMTs

**Learning Prerequisites**

**Recommended courses**
Physique général III et IV, Electronique I et II

Teaching methods
Lectures
Assignments
Lab sessions
Simulations

Assessment methods
homeworks, mid-term and final exams

 Supervision
Office hours  Yes
Assistants  Yes

Resources
Ressources en bibliothèque
• Integrated microelectronic devices : physics and modeling /del Alamo

Notes/Handbook
Notes and slides will be published on moodle after each lecture