

EE-557

**Semiconductor devices I**

Matioli Elison

Cursus	Sem.	Type
Electrical and Electronical Engineering	MA1, MA3	Obl.
Electrical and electronic engineering minor	H	Opt.
Energy Science and Technology	MA1, MA3	Opt.
MNIS	MA3	Opt.
Minor in Quantum Science and Engineering	H	Opt.
Quantum Science and Engineering	MA1, MA3	Opt.

Language of teaching	English
Credits	4
Session	Winter
Semester	Fall
Exam	During the semester
Workload	120h
Weeks	14
<b>Hours</b>	<b>4 weekly</b>
Courses	3 weekly
Exercises	1 weekly
<b>Number of positions</b>	

**Content**

1. Introduction to Semiconductor Physics
2. Carrier Generation and Recombination
  - link to LEDs and Solar cells
3. Charge Transport
  - 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

**Resources****Moodle Link**

- <https://go.epfl.ch/EE-557>