

EE-567

Semiconductor devices II

Ionescu Mihai Adrian, Kis Andras

Cursus	Sem.	Type
Electrical and Electrotechnical Engineering	MA2, MA4	Opt.
Minor in Quantum Science and Engineering	E	Opt.
Quantum Science and Engineering	MA2, MA4	Opt.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	During the semester
Workload	120h
Weeks	14
Hours	4 weekly
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Summary

Students will learn about understanding the fundamentals and applications of emerging nanoscale devices, materials and concepts. Remark: at least 5 students should be enrolled for the course to be given

Content

1. Advanced nm-channel CMOS devices (FinFET, UTB SOI, 2D materials, 3D integration, LiM)
2. Steep slope devices, energy efficiency (Tunnel FETs, negative-capacitance devices)
3. Neuromorphic devices and circuit architectures
4. 2D materials introduction and materials aspects
5. FETs with 2D materials switching, contact resistance, trap states
6. Optoelectronics with 2D materials
7. Emerging, post-CMOS concepts: valleytronics, spintronics, excitonic devices

Keywords

Nanoelectronics, nanodevices, 2D materials, CMOS and post-CMOS concepts

Learning Prerequisites**Required courses**

Semiconductor devices I
General Physics 4

Resources**Virtual desktop infrastructure (VDI)**

No

Moodle Link

- <https://go.epfl.ch/EE-567>