EE-567

Semiconductor devices II

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Cursus	Sem.	Type
Electrical and Electronical Engineering	MA2, MA4	Opt.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	Written
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