

SUBJECT DETAILS AND SYLLABUS

2019/2020. II. SEMESTER

<i>Subject Name</i>	<i>Microelectronics</i>
<i>Subject code</i>	<i>IVB273ANVM</i>
<i>Classes per week (L/P/Lab)</i>	<i>2,0,0</i>
<i>Number of Credits</i>	<i>3</i>
<i>Division/type</i>	<i>Electrical Engineering (BSc)/Embedded sys spec.</i>
<i>Program</i>	<i>full-time</i>
<i>Requirement</i>	<i>midterm grade</i>
<i>Semester</i>	<i>6th / 2019-2020. spring</i>
<i>Preliminary requirements</i>	<i>-</i>
<i>Organization name</i>	<i>Department of Automation</i>
<i>Responsible Lecturer(s)</i>	<i>Zsolt Kisander, Kálmán Máthé</i>

GOAL OF INSTRUCTION

This subject gives an introduction to semi-conductor physics and manufacturing technologies of semi-conductor devices.

SUBJECT CONTENT

The following topics will be discussed during the lectures:

- classification of materials according to their conductive properties
- crystalline structure of metals and semi-conductors
- carrier transport phenomena, generation and recombination processes
- p-n junction, depletion, current-voltage characteristics, transient behavior, junction breakdown
- bipolar transistor and related devices, transistor action, static characteristics, non-ideal effects
- MOS capacitor and MOSFET, carrier transport in MOS capacitors, charge-coupled devices
- MOSFET, CMOS, BiCMOS, MOS memory structures, power MOSFET
- Light Emitting Diodes, Photodetectors, Solar Cells
- Crystal growth and epitaxy, film formation, chemical vapor deposition
- Lithography and Etching, Impurity Doping, diffusion processes
- Integrated Devices

EXAMINATION AND EVALUATION SYSTEM

The final grade is the average of the homeworks. The homeworks will be short papers about selected topics.

LITERATURE

- Semiconductor Devices: Physics and Technology, Sze and Lee, 2012., ISBN-10: 0470537949
- The Art of Electronics 3rd Edition, Horowitz and Hill, 2015., ISBN-13: 9780521809269

SCHEDULE

		STUDY PERIOD, STUDY WEEKS															EXAM PERIOD				
2019/2020. II. SEMESTER		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	1.	2.	3.	4.	5.
Lecture number																					
Practice/Labs number																					
Midterm test																					
Homework	publishing						X			X											
	submitting											X			X						
Signature/Semester rating																					
Exam																					

2020.

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responsible lecturer