

Advanced Integrated Circuit Technology

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Content

1. Introduction to Microelectronics Technologies

- 1.1 *Definitions*
- 1.2 *Processes / Basic Technologies*
- 1.3 *Devices*
- 1.4 *Development Trends*

2. Specific Processes for Advanced Micro- and Nanoelectronics

- 2.1 *Specific CVD Processes*
- 2.2 *Epitaxy*
- 2.3 *Advanced PVD Processes*
- 2.4 *Atomic Layer Deposition*
- 2.5 *Ion Implantation / Special Annealing Processes*
- 2.6 *Advanced Lithography*
- 2.7 *Advanced Dry/Plasma Etching Processes*
- 2.8 *Chemical Mechanical Polishing/Planarization*
- 2.9 *Electrochemical Deposition and Electroless Deposition*

3. Semiconductor Process and Equipment Simulation and Modeling

- 3.1 *Numerical methods for semiconductor process and equipment simulation*
- 3.2 *Models and programming for advanced deposition techniques*
- 3.3 *Parameter optimization methods*

4. Integrated Circuit Technology

- 4.1 *CMOS Manufacturing Process / CMOS Process Modules*
- 4.2 *Specific Aspects of sub 100 nm CMOS Technology*
- 4.3 *New Transistor Concepts*
- 4.4 *Beyond CMOS Approaches*

5. 3D Technology for Increased Integration Density

- 5.1 *Background and Motivation*
- 5.2 *3D Technology*
- 5.3 *Single Processes for 3D*

Where to find the lecture transparencies:

Updated Versions for SS2022

Will be provided in OPAL:

- *As pdf for viewing and download*
- *After each lecture*
- *Only for internal use at TU Chemnitz for study purposes.*
- *Unauthorized copying and distribution is prohibited.*

Seminar Material:

Will be provided in OPAL few days before the seminar:

- *Please check OPAL for questions/tasks in preparation of the seminar*

Seminar

Each Wednesday of even week, starting April, 20th

Hybrid format

- Preferred: will be in presence in 2/W020 (new: C25.020) – capacity 30 people
- Check today or on April 6th if we need digital format (any students not at TU Chemnitz?)