

**EC 536 VLSI Fabrication and Testing of Integrated Circuits**

**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
EC 535 -	5	9	2	0	2	3

**COURSE AIM**

To familiarize students with the state of the art technology and processes of VLSI fabrication, and testing of VLSI integrated circuits..

**COURSE WEEKLY CONTENTS**

- 1 Choice of Technology and Process Technologies BJT, CMOS, and BiCMOS integrated circuits, silicon technology vs. GaAs.
- 2 Material Properties.
- 3 Phase Diagrams and Solid Solubility.
- 4 Crystal Growth.
- 5 Thermal Oxidation.
- 6 Diffusion (1).
- 7 Diffusion (2). + 7<sup>th</sup> week assessment + midterm Exam.
- 8 Ion Implantation.
- 9 Etching and Cleaning.
- 10 Modern Lithographic Techniques.
- 11 Epitaxy and Chemical-Vapor Deposition (CVD).
- 12 Metallization. + 12th week exam
- 13 Process Integration (CMOS and BJT).
- 14 Test Program and Test Pattern, Test Flowchart, Plan and Strategy.
- 15 Fault Diagnosis and Simulation, Testing Equipment.

**STUDENT GRADING & ASSESSMENT**

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	20 Midterm	←	10	MARKS		→	30
		To be freely distributed among possible assessments					
8 to 12	←		20	MARKS		→	20
13 to 15	←		10	MARKS		→	10
16 or 17	40 Final						40
<b>Total</b>	<b>Exams</b>	<b>Assign.</b>	<b>Quizzes</b>	<b>Reports</b>	<b>Present.</b>	<b>Lab.</b>	<b>100</b>

## REFERENCES

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- Textbook** • S. A. Campbell, "The Science and Engineering of Microelectronic Fabrication." 2nd. Ed. , Oxford University Press, 2001.
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- Other** • S.M. Sze, "VLSI Technology", 2<sup>nd</sup> ed., McGraw-Hill, 1988.  
• Ghandi, "VLSI Fabrication Principles", 2<sup>nd</sup> ed., JW, 1993.