Physical and Chemical Basis of Integrated Circuit Fabrication (MTSE 5520) (Syllabus)

• Instructor: Dr. Sundeep Mukherjee
• Time/Room: Wednesday 2:30 PM – 5:20 PM (DP – D202)
• Phone: 940-565-4170
• E-mail: sundeep.mukherjee@unt.edu
• Office: E-103, Discovery Park

Suggested Textbook
   Microchip Manufacturing by Stanley Wolf

Course Description
MTSE 5520 will cover the following topics – IC process flow, wafer fabrication, large scale integrated circuits, lithography, oxidation, ion implantation, wet & dry etching, multilevel metal interconnects, process integration

Course Schedule

<table>
<thead>
<tr>
<th>Tentative Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Jan 20</td>
<td>Introduction &amp; History of IC</td>
</tr>
<tr>
<td>Jan 27</td>
<td>Integrated Circuit Process Flow</td>
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<tr>
<td>Feb 03</td>
<td>Vacuum Technology &amp; Cleaning Technology</td>
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<tr>
<td>Feb 10</td>
<td>Thin-film and Sputter Deposition</td>
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<td>Feb 17</td>
<td>Silicon Single-Crystal Growth &amp; Wafer Production</td>
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<td>Feb 24</td>
<td>First Exam (in-class)</td>
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<td>Mar 02</td>
<td>Diffusion, Ion Implantation, &amp; Oxidation</td>
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<td>Mar 09</td>
<td>Lithography I</td>
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<td>Mar 16</td>
<td>Spring Break (No class)</td>
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<td>Mar 23</td>
<td>Lithography II</td>
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<td>Mar 30</td>
<td>Second Exam (in-class)</td>
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<td>Apr 06</td>
<td>Dry &amp; Wet Etching</td>
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<td>Apr 13</td>
<td>Chemical-Mechanical Polishing</td>
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<td>Apr 20</td>
<td>Multi-level Interconnects</td>
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<td>Apr 27</td>
<td>Assembly, Packaging &amp; Yield</td>
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<tr>
<td>May 04</td>
<td>Final Exam (in-class)</td>
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Points Distribution:
First exam/term project = 30%
Second exam/term project = 30%
Final exam/term project = 30%
Homework = 10%