CSCE 6731: Advanced Topics in VLSI Systems

Instructor: Prof. Saraju P. Mohanty  
Office: NTDP F247  
Office Hours: MW 3:00 -- 4:00 PM  
Phone: 940-565-3276  
Semester: Spring 2017  
Time: MW 4:00 -- 5:20 PM  
Place: NTDP D207A  
E-mail: saraju.mohanty@unt.edu

1. Credit Hours
3 credit hours. **May be repeated for credit with the consent of the instructor.**

2. Course objectives
To understand design, simulation, synthesis, and optimization of Nanoscale Digital and Analog/Mixed-Signal Circuits and Systems

3. Prerequisites
Some knowledge of computer logic design, semiconductor physics, architecture, or CMOS VLSI. The students who do not have the background can still take the course, but they should be prepared to spend additional time to learn them.

4. Level of the Course
The course is designed for graduate students.

5. Text Book

6. Selected Topics
1. Opportunities and Challenges of Nanoscale Technology and Systems
2. Nanoelectronics Issues for Design for Excellence
4. Mixed-Signal Circuit and System Simulation
5. Power, Parasitic, and Thermal Aware AMS-SoC Design Methodologies
6. Variability-Aware AMS-SoC Design Methodologies
7. Metamodel-Based Fast AMS-SoC Design Methodologies
8. Case study design examples

7. Course Requirements
   Attendance: Mandatory
   Assignments: There will be approximately 6 required assignments.
   Project: One mandatory individual project on current topic.
   Seminar: One mandatory individual seminar on current topic.
   Quizzes: There will be several surprise quizzes.
8. For More Information
   Website: https://learn.unt.edu/

9. Disability Accommodation
   The University of North Texas complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. The University of North Texas provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please see the instructor and/or contact the Office of Disability Accommodation at 940-565-4323 during the first week of class.

10. Course policy
    
    - **Attendance for this course is mandatory.** In the case of absence due to unavoidable reasons, substantial documented evidence must be provided.
    - Several assignments including exercise problems and design works will be given. The written or typed solutions for exercise problems and reports for design works must be submitted in the class at the beginning of lecture of announced deadline, else there will be late penalty of 20%. Under no circumstances late assignment will be accepted three days after deadline and score for such assignment will be zero.
    - The surprise quizzes will not have any makeup if a student fails to take them due to late entry to the class or absence in the class.
    - The course project is an individual project by a student. A student is expected work on his own and write the report using his/her own words and figures using proper references.
    - Discretionary points will be based on class performance and attendance.
    - Any questions regarding the grades should be clarified a week of returning the graded materials. If no complaint is formulated within one week then it will be considered that the student accepted the grade and the corresponding grades are considered definite.
    - Any email communications should be made using official email-ID. Emails from unofficial email-IDs will not be responded by the instructor.
    - No student shall be compelled to attend class or sit for a test on a day or time prohibited by his or her religious belief.
    - Dishonesty in this class will be handled as per the University of North Texas policy (http://www.unt.edu/csrr).
    - If a student needs any special accommodations according to the American Disability Act, he or she should let the instructor know.
    - **Student Perceptions of Teaching (SPOT) Completion:** The students should complete the SPOT, which is a short survey. The SPOT is a requirement for all organized classes at the UNT. SPOT will be made available for the students at the end of the semester to provide them a chance to comment on how this class is taught. The instructor is very much interested in the constructive feedbacks from the students to continually improve his teaching of this course.
### 11. Grade Distribution

<table>
<thead>
<tr>
<th>Items</th>
<th>% of Final Grade</th>
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</thead>
<tbody>
<tr>
<td>Homework</td>
<td>15</td>
</tr>
<tr>
<td>Quiz</td>
<td>10</td>
</tr>
<tr>
<td>Project</td>
<td>40 (abstract--5, midterm report--5, final report--15, demonstration--10, implementation--5)</td>
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<tr>
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<td><strong>Deadlines:</strong></td>
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<tr>
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<td>Abstract – 27th Feb 2017 (Mon)</td>
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<td>Midterm Report – 20th Mar 2017 (Mon)</td>
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<td>Final Report -- 19th Apr 2017 (Wed)</td>
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<td>Demonstration -- 26th Apr 2017 (Wed) 1st May 2017 (Mon), and 3rd May 2017 (Wed)</td>
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<tr>
<td>Seminar</td>
<td>30 (Presentation--10)</td>
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<td><strong>Deadlines:</strong></td>
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<td></td>
<td>Presentation -- 17th Apr 2017 (Mon), 19th Apr 2017 (Wed), and 24th Apr 2017 (Mon)</td>
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<tr>
<td>Discretionary</td>
<td>5</td>
</tr>
</tbody>
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### 12. Grading Policy

A $\geq$ 90; 90 $>$ B $\geq$ 80; 80 $>$ C $\geq$ 70; 70 $>$ D $\geq$ 60; F $< 60$

**Notice:** (1) Grading method may be changed if the CSE Department so decides. (2) NO border grade concession.