EE213A - EE298-2

EE298-2: VLSI Architectures and Design Methodologies

1. Prerequisites

Prerequisites: EE 113 (Digital Signal Processing), EE115C (Digital Integrated Circuits) or equivalent

To your benefit: EE216A, EE212A

2. Grades

• Homeworks: 20 %. There will be two traditional homeworks. These homeworks are made alone.
• Paper presentation or other class related presentation: 20%.
• Project: 35% There will be one CAD based project. Teams of two students will make one small project that requires the use of Computer Aided Design tools.
• Midterm - Final: 25% There will be one late midterm - early final, during the second half of the quarter (week 7 or 8).

3. Textbook

There is no textbook. Class related papers will either be distributed in class or posted on the class webpage.

4. Lecture & Office Hours

Lecture Hours: Mon - Wed: 12.00 - 1.50 pm, in Boelter 4283.
Office Hours: Mon - Wed: 3.00 - 5.00 pm, in 7440B Boelter Hall
5. Topics:

Table 1: Lecture topics

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<th>Week</th>
<th>Topics</th>
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| 1    | Lecture 1: General introduction, Practical stuff  
      | Lecture 2: ASIC’s, Bit parallel architectures |
| 2    | Lecture 3, 4: ASIC bit serial architectures |
| 3    | Lecture 5, 6: ASIC design for low power  
      | (including guest lecture by Angeles Design Systems) |
| 4    | Lecture 7, 8: ASIC/Special purpose processor design  
      | (including guest lecture by Art Designer) |
| 5    | Lecture 9, 10: Programmable fixed-point DSP processors, basics  
      | (including guest lecture by Mr. Ueda, Matsushita/Panasonic) |
| 6    | Lecture 11, 12: Programmable fixed-point DSP processors: advanced topics |
| 7    | Lecture 13, 14: Signal processing extensions to general purpose microprocessors. (including guest lecture Tensilica) |
| 8    | Lecture 15: Midterm  
      | Lecture 16: Programmable processors (cont.) |
| 9    | Project presentation |
| 10   | Guest lecture - presentation by: F. Catthoor  
      | Project presentation |

Lectures subject to change depending on the schedule of guest lectures.

Computer Aided Design Tools: Tools that help the designer translate his/her specifications at a high level of abstraction to some implementation platform. The following tools will be reviewed during the course.

- Angeles Design Systems (www.angeles.com): DSP Canvas™
- Art Designer: DSP Design tool from Frontier Design (www.frontierd.com)
- Easics: www.easics.be - integration of ASIC components with software components
- Ocapi: (www.imec.be/ocapi/)
- Tensilica: www.tensilica.com