High-Frequency Integrated Circuit Design

COURSE SYLLABUS

Course Description

This class focuses on radio-frequency integrated circuit (RFIC) design for wireless transceivers. Firstly, various system architectures will be explored and compared. Secondly, circuit design considerations for building blocks will be addressed. Finally, issues with system integration will be discussed.

Throughout the course, both CMOS and bipolar implementation will be discussed in parallel, and, when possible, emphasis will be placed on low-power and low-voltage design.

Prerequisites

Students must have taken ECE 304, 343, and 344, or equivalent and must have basic skills in designing and analyzing analog integrated circuits. Although review will be done whenever possible, it will be assumed that students are familiar with advanced analog IC design, microwave engineering, and basic communication theory.

References


Lecture Notes and Review Notes

Lecture notes and review notes will be made available for downloading from the class web page, http://course.ee.ust.hk/elec528.

Projects

There will be two class projects. For the first project, students are asked to design and simulate a receiver or transmitter of their choice at behavioral level. For the second one, students are to design one of the building blocks at the transistor level and to verify its function with the rest of the system using mixed-mode simulation. Students should work in groups of two.

Project description will be given in full detail later. Tentatively, the first project is due sometime around March 13, and the final project is due on the last day of the semester, May 18. There will also be a presentation for the final project, which is scheduled on May 11.
Homework

Homework is assigned approximately once every two or three weeks and is due in class. Late homework will not be accepted. Tentatively, one homework assignment with the lowest scores will be discarded at the end.

Miscellaneous

A WWW home page for the class has been set up at http://course.ee.ust.hk/elec528/. Important announcement and information will be posted there for access and reference.

Grading

Tentatively, the grade weighting for the class will be distributed as follows:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework</td>
<td>30 %</td>
<td></td>
</tr>
<tr>
<td>Midterm Project</td>
<td>30 %</td>
<td></td>
</tr>
<tr>
<td>Final Project Presentation</td>
<td>15 %</td>
<td></td>
</tr>
<tr>
<td>Final Project Report</td>
<td>25 %</td>
<td></td>
</tr>
</tbody>
</table>

Staff Information

<table>
<thead>
<tr>
<th>Name</th>
<th>Duty</th>
<th>Email</th>
<th>Phone</th>
<th>Office</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patrick Yue</td>
<td>Lecturer</td>
<td>eepatrick</td>
<td>7047</td>
<td>2518</td>
<td>Wed 10 am – 12 PM, or by appointment</td>
</tr>
<tr>
<td>Alex Quan Pan</td>
<td>TA</td>
<td>panquan</td>
<td>8841</td>
<td>3111a</td>
<td>Tue 7-9 PM</td>
</tr>
</tbody>
</table>