EE2015: Electric Circuits and Networks

Introduction

Nagendra Krishnapura
Dept. of EE, IIT Madras

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nagendra@iitm.ac.in
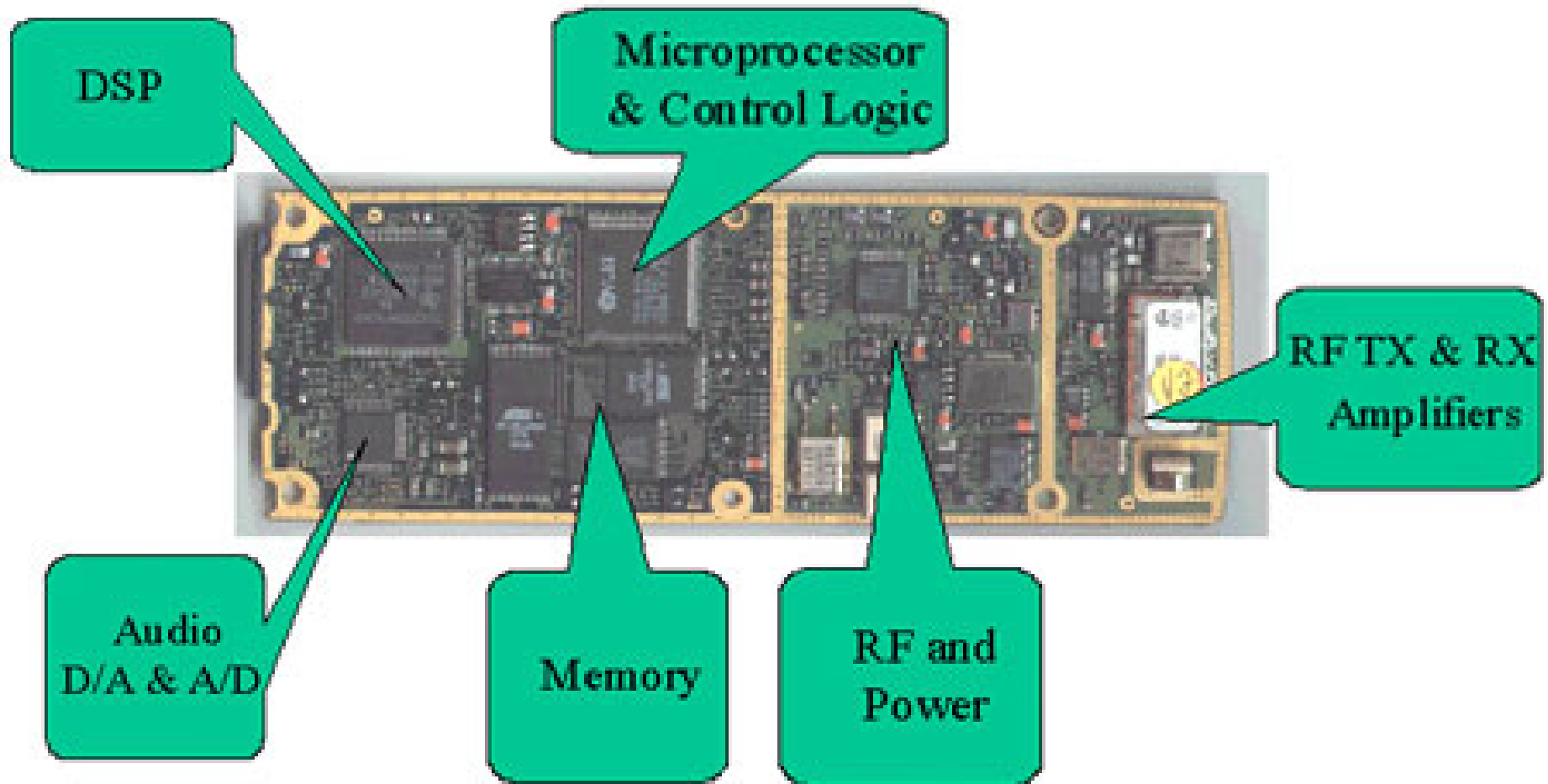EE2015: Moodle page
www.ee.iitm.ac.in/courses/ee2015_2017/start

What are Electric Circuits?

- Interconnection of Electrical Components
- All electronic and electrical gadgetry
- Absolutely **everywhere** around us!

Mobiles, Laptops, Music players, ...

[http://static.ddmcdn.com/gif/cell-phone-inside.jpg]

Mobiles, Laptops, Music players, ...

[http://smartech.blogetery.com/files/2008/04/asus-eee-pc-900-inside.jpg]

Transformers, Generators, ...

What is EE2015 all about?

- Analysis techniques applicable to **all circuits**
- Not about any particular circuit
- One of the two most important EE courses (the other being Signals and Systems)
- Pre-requisite for understanding of:
    - Analog circuits, Digital circuits
    - Electrical machines, Power systems
    - Placements in core EE companies!

Course topics

- Electrical quantities and elements

- Electrical circuit analysis; Theorems

- One and two port networks; Transformations

- Negative feedback and ideal opamp

- RL, RC, RLC circuits

  - Solving differential equations

  - Forced and natural response

  - Sinusoidal steady state; Phasors

- Polyphase circuits

- Laplace transforms

Course goals

- Learn circuit analysis and learn it well!

  - **<u>Practice, practice, and practice</u>** problem solving
  - Understand **<u>every step</u>** of problem solving

- Learn about linearity and its implications

- Learn rudiments of nonlinear circuit analysis

Logistics

- Time table:
  - C slot(Mo 10am, Tu 9am, We 8am, Fr 1pm)
  - Extended tutorial in T slot(2pm-440pm)
  - Classroom: ESB128
- Evaluation
  - 4 quizzes (total of 50%; 23 Aug., 13th Sep., 11th Oct., 1st Nov.)
  - End sem (40%)
  - Tutorials (10%)

Tutorials

- ~ 12 tutorials over the semester
- Problem sets will be posted in advance
- Must solve problems <u>before</u> the tutorial session
- Use extended tutorial sessions for clarifications and understanding difficult concepts

Classroom etiquette and expectations

- Mobile phones off

- 85% attendance

- Don't enter the class if more than 5 minutes late

- TAs take attendance in the first 5 minutes

- **Must solve problems** given in class

  - Bring your pen, notebook, calculator and **use them**

- **Participate** in classroom Q&A

Classroom participation

- Get your doubts cleared

- Improve your understanding

- Develop (technical) communication skills

    - Poor communication skills-a constant complaint from prospective employers

"Learning" or "Knowing" something

- What does it mean?

"Learning" or "Knowing" something

- Make quantitative predictions about similar or slightly different situations

- Practice solving a variety of problems...

- ...while understanding every step

- Will not happen without your active participation both inside and outside the classroom

Some inspiration

- http://teachingexcellence.mit.edu/inspiring-teachers/amar-bose-6-312-lecture-01-introduction

- http://teachingexcellence.mit.edu/inspiring-teachers/amar-bose-6-312-lecture-27-personal-reflections

Resources

- Class homepage
    - EE2015 page on moodle-Use the forum!
    - http://www.ee.iitm.ac.in/vlsi/courses/ee2015_2017/start
- Lectures recorded in the classroom:
    - http://www.ee.iitm.ac.in/~nagendra/videolectures/
- Reference books
    - Hayt, Kemmerly, and Durbin, *Engineering Circuit Analysis*, 7th Edition, McGraw Hill 2006.
- Extras: NPTEL(http://nptel.iitm.ac.in)
    - SC Dutta Roy, *Circuit Theory*, http://nptel.iitm.ac.in/video.php?subjectId=108102042

Resources: TAs

- Visiting hours, venue: TBA
- Use moodle forum to reach the TAs

Videolectures page

- http://www.ee.iitm.ac.in/videolectures/
- http://10.21.17.5/videolectures/

Course page on VLSI group site

- http://www.ee.iitm.ac.in/vlsi/teaching/start
- http://10.21.17.5/vlsi/teaching/start

Course page on Moodle

- https://courses.iitm.ac.in/

My homepage

- http://www.ee.iitm.ac.in/~nagendra/

Announcement

- No class tomorrow, 2nd August
- No extended tutorial this week(2-440pm, Friday)