

EC1010: Electrical and Magnetic Circuits

Introduction

Nagendra Krishnapura
Dept. of EE, IIT Madras

17th January 2013

nagendra@iitm.ac.in

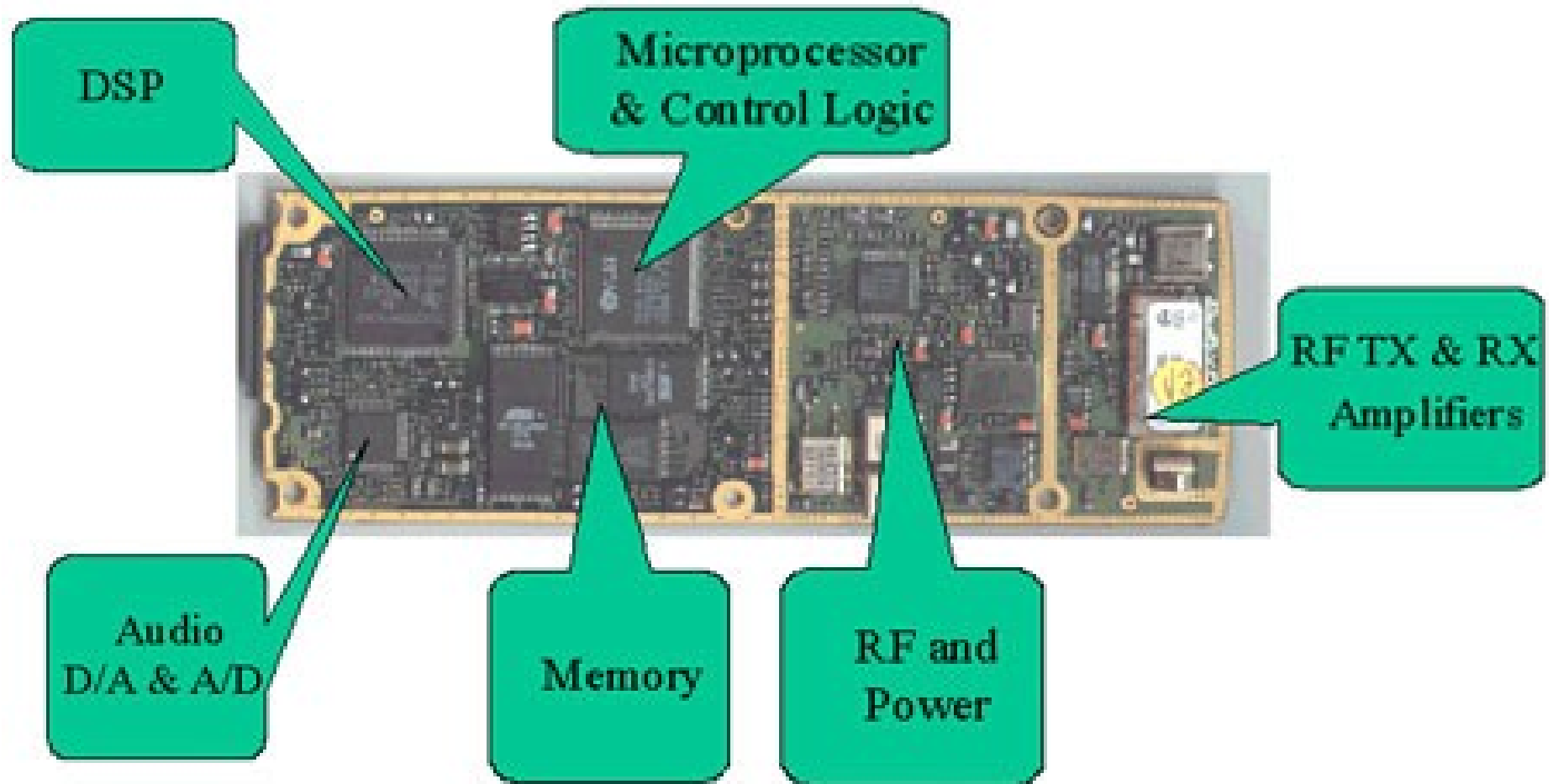
EC1010: Moodle page

www.ee.iitm.ac.in/courses/ec1010_2013/start

What are E & M Circuits?

- Electrical Circuits:
 - Interconnection of Electrical Components
 - All electronic and electrical gadgetry
- Magnetic Circuits:
 - Interconnection of Magnetic Components
 - Generators, Motors, Transformers
- 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, ...



[http://i01.i.aliimg.com/photo/v0/110482299/Power_Transformer.jpg]

[<http://media.digikey.com/Renders/Johanson%20Tech%20Renders/2.45GHz%20Balun6.jpg>]

What is EC1010 all about?

- Analysis techniques applicable to **all circuits**
- Not about any particular circuit
- One of the two most important EE courses (the other being Networks and Systems)
- Pre-requisite for:
 - Networks and Systems
 - Electrical Machines
 - Analog Circuits
 - 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
- Magnetic circuits

Course goals

- Learn circuit analysis and learn it well!
 - Practice, practice, and practice problem solving
 - Understand every step of problem solving
- Learn about linearity and its implications

Logistics

- Time table:
 - A slot(Mo 8am, Tu 1pm, Th 11am, Fr 8am)
 - Classroom: CRC101
- Evaluation
 - 4 quizzes (total of 50-60%; Feb. 4, Feb. 25, Mar. 18, Apr 15)
 - End sem (40%)
 - Problem sets (up to 10%)

Tutorials

- ~ 10 tutorials over the semester
- Problem sets will be posted in advance
- Must solve problems before the tutorial session and bring the solution to class
- Use 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
- Don't sit in the back rows
- **Must solve problems** given in class
 - Bring your pen, notebook, calculator and **use them**
- **Participate** in classroom Q&A

Resources

- Class homepage
 - EC1010 page on moodle-Use the forum!
 - http://www.ee.iitm.ac.in/vlsi/courses/ec1010_2012/start
- Lectures recorded in the classroom:
 - <http://www.ee.iitm.ac.in/~nagendra/videolectures/>
- Textbook
 - 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

ABHISHEK KUMAR

YADAV SHON BALKRISHNA

GAURAV AGRAWAL

CHAVVA ANUSHA

VIJAYAKUMAR M MADIWALAR

GARIMA GUPTA

GOPAL KRISHNA KAMATH M

ROMITA CHAUDHURI

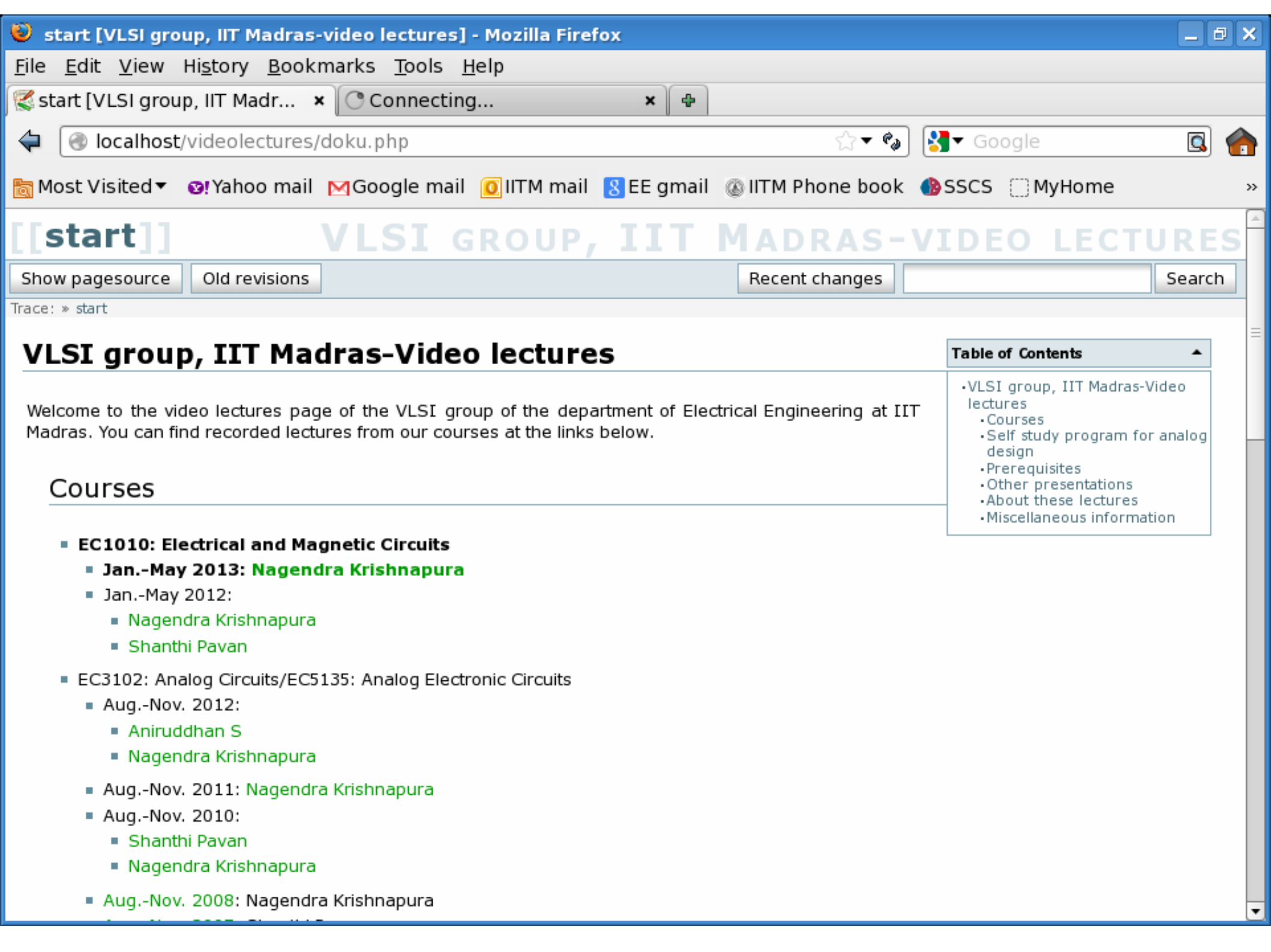
SREERAG S N

WANSAGAR ROHIT MAROTIRAO

MADHUP SHUKLA

NAVNEETH K

- Visiting hours: TBA, venue: EE Dept. library
- Use moodle forum to reach the TAs



start VLSI GROUP, IIT MADRAS-VIDEO LECTURES

Show pagesource Old revisions Recent changes Search

Trace: * start

VLSI group, IIT Madras-Video lectures

Welcome to the video lectures page of the VLSI group of the department of Electrical Engineering at IIT Madras. You can find recorded lectures from our courses at the links below.

Courses

- EC1010: Electrical and Magnetic Circuits
 - Jan.-May 2013: Nagendra Krishnapura
 - Jan.-May 2012:
 - Nagendra Krishnapura
 - Shanthi Pavan
- EC3102: Analog Circuits/EC5135: Analog Electronic Circuits
 - Aug.-Nov. 2012:
 - Aniruddhan S
 - Nagendra Krishnapura
 - Aug.-Nov. 2011: Nagendra Krishnapura
 - Aug.-Nov. 2010:
 - Shanthi Pavan
 - Nagendra Krishnapura
 - Aug.-Nov. 2008: Nagendra Krishnapura

Table of Contents
- VLSI group, IIT Madras-Video lectures - Courses - Self study program for analog design - Prerequisites - Other presentations - About these lectures - Miscellaneous information

VLSI group, IIT Madras

Home People Research Publications Teaching Prospective Students SMDP TI RAships

EC1010: Electrical and Magnetic Circuits(Jan.-May 2013)

Instructor

- Nagendra Krishnapura

Classrooms

- CS15

Schedule

A slot(Mo 8am, Tu 1pm, Th 11am, Fr 10am)

Teaching Assistants

Evaluation

There will be four quizzes(Feb 4, Feb 25, Mar 18, Apr 15) and an end semester exam. The quizzes will count for 50-60% of the grade and the end semester exam for the remaining 40%. Tutorials held periodically will count for up to 10% of the grade.

Recorded lectures

The recorded lectures are available [here](#). You can also find lectures from previous years at the same link. The  introductory lecture has information on prerequisites and references.

– Table of Contents

- EC1010: Electrical and Magnetic Circuits(Jan.-May 2013)
 - Instructor
 - Classrooms
 - Schedule
 - Teaching Assistants
 - Evaluation
 - Recorded lectures
 - Tutorials
 - Text book
 - References
 - Attendance

Course: EC1010: Electrical and Magnetic Circuits - Mozilla Firefox

File Edit View History Bookmarks Tools Help

start [VLSI group, IIT Madr... x] courses:ec1010_2013:sta... x Course: EC1010: Electrica... x +

https://courses.iitm.ac.in/course/view.php?id=2288

Google

Most Visited Yahoo mail Google mail IITM mail EE gmail IITM Phone book SSCS MyHome

You are logged in as **NAGENDRA KRISHNAPURA (EE)** (Logout)

EC1010: Electrical and Magnetic Circuits

Home ▶ My courses ▶ EC1010: JAN-MAY 2013 Turn editing on

Navigation

Home

- My home
- Site pages
- My profile
- My courses
 - EL3203: JAN-MAY 2013
 - EC1010: JAN-MAY 2013**
 - Participants
 - Reports
 - General
 - Topic 1
 - Topic 2
 - Topic 3
 - Topic 4

Recorded lectures at VLSI group video lectures site

VLSI group course homepage

EC1010 forum

Quiz I

Quiz II

Quiz III

Quiz IV

Topic 1

Topic 2

Topic 3

Topic 4