EE6307 ANALOG INTEGRATED CIRCUIT DESIGN

Acad Unit: 3 AU
Prerequisite: Nil
Effective: AY2014-15
Last update: October 2013

OBJECTIVE

The course offers a broad range of topics for analog integrated circuits or mixed-signal integrated circuit systems, with the objective to emphasis on the topics:

1. Overview of analog IC fundamentals on components, noise and layouts
2. Theory on frequency compensation, band-gap reference and switched network fundamentals
3. Analysis of analog circuits including transfer functions and feedback mechanisms
4. Circuit design for current mirror circuits, amplifiers, continuous-time filters, switched-capacitor filters, current mode circuits and ADCs
5. Implementation of circuits and systems, with design considerations relating advantages, disadvantages and performance tradeoffs.

LEARNING OUTCOME

The learning outcomes of this subject are:

1. Understand the limitations of analog and mixed-signal integrated circuits.
2. Able to analyze analog building blocks.
3. Understand various circuit techniques for tackling different design requirements.
4. Able to design analog signal-processing blocks.
5. Understand circuit perspectives that are needed to synthesize integrated systems.

OTHER RELEVANT INFORMATION

The course serves an advanced conversion course for those who wish to gain in-depth knowledge in the integrated circuit design area or prepare for advanced research studies in a particular specialized topic.

CONTENT

Review of Fundamentals. Analog Building Blocks. Switched Capacitor Circuits. Current Mode Circuits. Continuous-Time Filters. Data Converters.

ASSESSMENT SCHEME

Continuous Assessment	20%
Final Examination	80%

TEXTBOOKS

1. Tony Chan Carusone, David Johns and Ken Martin, “Analog Integrated Circuit Design”, 2nd Edition, John Wiley & Sons, Inc., 2013.
2. Circuits and Systems Tutorials: ISCAS '94, edited by Chris Toumazou, et al., IEEE Press, November 1995.
3. P. V. Ananda Mohan, V. Ramachandran, M. N Swamy, Switched Capacitor Filter Theory, Analysis and Design Prentice-Hall, June 1995.