ECE 584
Analog CMOS Integrated Circuit Design
Spring 2019

Instructor: Dr. George L. Engel (EB-3043)
Time: M, W (1:30 PM - 2:45 PM)
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Course Description
Course material includes the study of the operating principles of CMOS analog integrated
circuits, physics of MOS devices, linearized models of MOSFETs, and circuit design tech-
niques for realizing CMOS operational amplifiers, current references, voltage references, etc.

Grading Policy
Midterm Exam  20 %
Final Exam    20 %
Midterm Project 25 %
Final Project  25 %
Homework Assignments 10 %

Administrative Issues
Based on University Class Attendance Policy 119: It is the responsibility of students to
ascertain the policies of instructors with regard to absence from class, and to make arrange-
ments satisfactory to instructors with regard to missed course work. Failure to attend the
first session of a course may result in the students place in class being assigned to another
student.
If you have a documented disability that requires academic accommodations, please go to Disability Support Services (DSS) for coordination of your academic accommodations. DSS is located in the Student Success Center, Room 1270; you may contact them to make an appointment by calling (618) 650-3726 or sending an email to disabilitysupport@siue.edu. Please visit the DSS website located online at www.siue.edu/dss for more information.

Students are expected to be familiar with and follow the Student Academic Code. It is included in the SIUE Policies and Procedures under Section 3C2.2.

Required Texts

Analog Integrated Circuit Design
John Wiley & Sons
Tony Carusone, David A. Johns, Kenneth W. Martin
ISBN Number: 978-0-470-77010-8

Course Outline

M Jan 14    MOS Transistors (Sec. 1.2)
W Jan 16    Advanced MOS Modelling (Sec. 1.4)
M Jan 21    *** Martin Luther King Day (NO CLASS) ***
W Jan 23    Passive Devices (Sec. 1.6)
M Jan 28    Variability and Mismatch (Sec. 2.3)
W Jan 30    Analog Layout Considerations (Sec. 2.4)
M Feb 04    Simple CMOS Current Mirror (Sec. 3.1)
W Feb 06    Common Source Amplifier (Sec.3.2)
M Feb 11    Source Follower (Sec. 3.3)
W Feb 13    Common Gate Amplifier (Sec. 3.4)
M Feb 18    Cascode Current Mirrors (Sec. 3.6)
W Feb 20    Cascode Gain Stage (Sec. 3.7)
M Feb 25    MOS Differential Pair (Sec. 3.8)
W Feb 27    Frequency Response of Linear Systems (Sec. 4.1)
M Mar 04    Frequency Response of Elementary Transistor Circuits (Sec. 4.2)
W Mar 06    Midterm Exam (Chapters 1, 2, 3)
M Mar 11   ***** SPRING BREAK *****
W Mar 13   ***** SPRING BREAK *****
M Mar 18  Cascode Gain Stage (Sec. 4.3)
W Mar 20  Source Follower Amplifier (Sec. 4.4)
M Mar 25  Feedback Amplifiers Review (Chapter 5)
W Mar 27  Two-Stage CMOS Opamp (Sec. 6.1)
M Apr 01  Two-Stage CMOS Opamp (Sec. 6.1)
W Apr 03  Op-Amp Compensation (Sec. 6.2)
M Apr 08  Folded Cascode Opamp (Sec 6.4)
W Apr 10  Folded Cascode Opamp (Sec 6.4)
M Apr 15  Analog Integrated Circuit Biasing (Sec. 7.1)
W Apr 17  Establishing ConstantVoltages and Currents (Sec. 7.3)
M Apr 22  Establishing Constant Voltages and Currents (Sec. 7.3)
W Apr 24  Noise Analysis and Modeling (Chapter 9)
M Apr 29  Noise Analysis and Modeling (Chapter 9)
W May 01  Noise Analysis and Modeling (Chapter 9)