



Course Syllabus: Monolithic Amplifier Circuits - EE 202

Division	Computer, Electrical and Mathematical Sciences & Engineering
Course Number	EE 202
Course Title	Monolithic Amplifier Circuits
Academic Semester	Fall
Academic Year	2018/2019
Semester Start Date	08/26/2018
Semester End Date	12/11/2018
Class Schedule (Days & Time)	09:00 AM - 10:30 AM Mon Wed

Instructor(s)				
Name	Email	Phone	Office Location	Office Hours
Hossein Fariborzi	hossein.fariborzi@kaust.edu.sa	+966128087302	3275, 3, Ibn Sina (bldg. 3)	Monday-Wednesday 10:30-11:30AM

Teaching Assistant(s)	
Name	Email
TBA	

Course Information	
Comprehensive Course Description	This course covers principles of designing and optimizing analog and mixed-signal circuits in CMOS technologies, including an overview of Device physics of the MOS transistor, small and large signal models, Analysis and design of CMOS multi-transistor amplifiers, passive and active current mirrors, feedback theory and application to feedback amplifiers, Stability considerations, Miller compensation noise analysis.
Course Description from Program Guide	This course covers principles of designing and optimizing analog and mixed-signal circuits in CMOS technologies, including an overview of device physics of the MOS transistor, small and large signal models, Analysis and design of CMOS multi-transistor amplifiers, feedback theory and application to feedback amplifiers, Stability considerations, pole- zero cancellation, root locus techniques in feedback amplifiers, and noise analysis.
Goals and Objectives	1- Gain a deep understanding of the operation and application of MOSFETs in microelectronics 2- Gain a solid understanding of the world of analog circuit design and a solid design experience with major circuit design CAD tools. 3- Learn about different types of amplifiers and major trade-offs in design and optimization of analog circuits.
Required Knowledge	- Circuit theory - Transistor operation
Reference Texts	Analysis and Design of Analog Integrated Circuits, 5th Edition, Paul Grey et al. Design of Analog CMOS Integrated Circuits, Behzad Razavi

Method of evaluation	10.00% - Quiz(zes) 20.00% - Midterm exam 20.00% - Homework /Assignments 30.00% - Final exam 20.00% - Course Project(s)
Nature of the assignments	Problem sets Individual Projects
Course Policies	No late HWs, no late project
Additional Information	

Tentative Course Schedule

(Time, topic/emphasis & resources)

Week	Lectures	Topic
1	Mon 08/27/2018 Wed 08/29/2018	Class Introduction Transistor ideal operation
2	Mon 09/03/2018 Wed 09/05/2018	DC and AC analysis Single stage amplifiers (1)
3	Mon 09/10/2018 Wed 09/12/2018	Single Stage Amplifiers (2)
4	Mon 09/17/2018 Wed 09/19/2018	Tools tutorial
5	Mon 09/24/2018 Wed 09/26/2018	Multi stage amplifiers
6	Mon 10/01/2018 Wed 10/03/2018	Mid Term 1 Multi Stage Amplifiers (2)
7	Mon 10/08/2018 Wed 10/10/2018	Current Mirrors Bias Sources
8	Mon 10/15/2018 Wed 10/17/2018	Differential Amplifiers
9	Mon 10/22/2018 Wed 10/24/2018	Feedback and Stability
10	Mon 10/29/2018 Wed 10/31/2018	Bandgap references Offset and Noise analysis
11	Mon 11/05/2018 Wed 11/07/2018	Advanced current mirrors Project introduction and class discussion
12	Mon 11/12/2018 Wed 11/14/2018	The art of analog layout design The future of analog and mixed signal circuit design
13	Mon 11/19/2018 Wed 11/21/2018	Project progress discussion Course review
14	Mon 11/26/2018 Wed 11/28/2018	Class presentations Individual project Q&A
15	Mon 12/03/2018 Wed 12/05/2018	Final exam Mon Dec 3
16	Mon 12/10/2018	
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Note

The instructor reserves the right to make changes to this syllabus as necessary.