1. *Course number and name*

**ENGR 445: Analog Integrated Circuit Design**

1. *Credits and contact hours*

4 credit hours

1. *Instructor’s or course coordinator’s name*

Instructor: Hao Jiang,

Course coordinator: Hao Jiang, Professor

1. *Text book, title, author, and year*

Tony Chan Carusone, David A. Johns, and Kenneth W. Martin, “Analog Integrated Circuit Design” 2nd Edition. Wiley, 2012 (ISBN: 0470-77010-4)

*a. other supplemental materials*

1. Philip Allen and Douglas Holberg, “CMOS Analog Circuit Design”3rd, Oxford Press, 2011
2. Behzad Razavi “Design of Analog CMOS Integrated Circuits**”** McGraw-Hill, 2000
3. *Specific course information*
4. *brief description of the content of the course (catalog description)*

Integrated circuit technology, transistor characteristics and models. Analysis and design of monolithic op amps. Frequency response, negative feedback, stability, circuit simulation.

1. *prerequisites or co-requisites*

Grades of C- or better in Engr 353 and Engr301

1. *indicate whether a required, elective, or selected elective course in the program*

Elective for Electrical Engineering.

1. *Specific goals for the course*
2. *Specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

* To study basic semiconductor principles and analog IC technology.
* To study analog IC building blocks up to the complete op amp.
* To investigate the frequency response of analog ICs.
* To study negative feedback, stability, and frequency compensation.
* To design and simulate the performance of analog ICs in the laboratory.

1. *Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

Course addresses ABET Student Outcome(s): 1, 2, 3, 5, 6, 7

1. *Brief list of topics to be covered*

* Models for integrated-circuit active devices
* CMOS integrated circuits technology
* Single-transistor and two-transistor amplifiers
* Current sources, active loads, and output stages
* Large-signal and small-signal analysis of an op amp
* Frequency and time responses of integrated circuits
* Negative feedback
* Frequency response, stability, and frequency compensation of negative-feedback amplifiers