

Course Code	Course Name	L-T-P-C	Year of Introduction
06EC6016	Analog Integrated Circuit Design -2	4-0-0-4	2015
<p>Course Objectives</p> <ol style="list-style-type: none"> To give the Student an idea about:- The state-of-the-art review of the principles, concepts and techniques required to produce successful designs of analog integrated circuits using CMOS technologies. Analysis of various circuits such as current mirrors, differential amplifiers and op amps. Analysis of switched capacitor circuits, basics of Data converters. 			
<p>Syllabus</p> <p>Analysis of various current mirror structures, differential mpliers and Operational Amplifiers; Comparator design and data converter types, switched capacitor types.</p>			
<p>Course Outcome</p> <p>Students who successfully complete this course will be able to design and simulate analog circuits using spice, and analyze problems related to fabrication of analog ICs; an ability to design a CMOS based system, component, or process within realistic constraints; an ability to use the techniques, skills, and modern tools necessary for CMOS based circuit design.</p>			
<p>Text Books</p> <ol style="list-style-type: none"> R. Jacob Baker, Harry W Li, David E Boyce, “ CMOS – Circuit Design, Layout, and Simulation”,3rd Edition, 1998. BehzadRazavi , “Design of Analog CMOS Integrated Circuits”, Tata McGraw Hill 2008. Philip E Allen, Douglas R Holberg, "CMOS Analog Circuit Design" International Student(Second) Edition, First Indian Edition 2010 			
Course Plan			
Module	Content	Hours	Sem. Exam Marks
I	Current Mirrors- Simple MOS Current Mirror: Sensitivity Analysis, Temperature Analysis, Transient Response. Cascode Current Mirror -Band Gap References, Supply Independent Biasing, Temperature Independent References, PTAT Current Generation, Constant Gm Biasing	14	25
II	CMOS Differential Amplifiers Introduction, Basic Differential Pair – Analysis, Common Mode Response, Differential Pair with MOS Loads, Frequency Response, Noise Analysis.	14	25

	INTERNAL TEST 1		
	CMOS Operational Amplifiers: Operational Transconductance Amplifiers (OTA), One stage and two stage operational amplifiers, Gain Boosting , Common Mode Feedback, Cascode and Folded Cascode Structures, Stability Analysis, Introduction to compensation techniques.		
III	<p>CMOS Comparators- Characterization of a comparator ,Two stage open loop comparators, Other Open loop Comparatos - Push-pull output comparator, comparators capable of driving very large capacitive loads</p> <p>CMOS Data Converters - Basics of CMOS Data Converters-Medium and High speed CMOS Data converters Over sampling Converters.</p>	12	25
	INTERNAL TEST 2		
IV	Switched Capacitor Circuits-Switched capacitor amplifiers, Switched capacitor integrators, First and Second Order Switched Capacitor , Switched Capacitor Filters.	12	25
END SEMESTER EXAM			