

Analog IC Design

Course Code	23EC4601A	Year	III	Semester	II
Course Category	PE-II	Offering Branch	ECE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Electronic Devices & Circuits
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		BL
CO1	Understand the concepts of MOS Devices and Modeling.	L2
CO2	Design and analyze basic Analog Circuits	L4
CO3	Design and analyze Amplifiers	L4
CO4	Analyze Open-Loop Comparators and Different Types of Oscillators	L4

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (H: High (3), M: Medium (2), L:Low (1))													
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO1	2				3						1	2	
CO2	3	3	3		3						1	3	
CO3	3	3	3		3						1	3	
CO4	3	3	3		3						1	3	
Average	3	3	3		3						1	3	

Syllabus		
Unit No.	Content	Mapped CO
1	MOS Devices and Modelling: The MOS Transistor, Passive Components- Capacitor & Resistor, Integrated circuit Layout, CMOS Device Modelling- Simple MOS Large-Signal Model, Other Model Parameters, Small-Signal Model for the MOS Transistor.	CO1
2	Analog CMOS Sub-Circuits: MOS Switch, MOS Diode, MOS Active Resistor, Current Sinks and Sources, Current Mirrors, Cascode current Mirror and Wilson Current Mirror	CO2
3	CMOS Amplifiers: Inverters, Differential Amplifiers, Cascode Amplifiers, Current Amplifiers, Output Amplifiers, High Gain Amplifiers	CO3
4	Comparators: Characterization of Comparator, Two-Stage Op_Amp, Open-Loop Comparators, Other Open-Loop Comparators.	CO4
5	Oscillators & Phase-Locked Loops: General Considerations, Ring Oscillators, LC Oscillators, Voltage Controlled Oscillators. Simple PLL, Applications of PLL: simple frequency synthesizer.	CO4

Learning Recourse(s)
Text Books
1. Behzad Razavi , Design of Analog CMOS Integrated Circuits-, TMH Edition, 2 nd Ed.,

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| 2. Philip E. Allen and Douglas R. Holberg, CMOS Analog Circuit Design Oxford University Press, International Second Ed.,/Indian Ed., |
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Reference Books

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| 1. Paul R. Gray, Paul J. Hurst, S. Lewis and R. G. Meyer, Analysis and Design of Analog Integrated Circuits- Wiley India, 5 th Ed., |
| 2. David A.Johns, Ken Martin, Analog Integrated Circuit Design- Wiley Student Ed., |

e- Resources & other digital material
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| 1. https://archive.nptel.ac.in/courses/117/106/117106030 |
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