

Course Number and Name	
BEC405 - LINEAR INTEGRATED CIRCUITS	
Credits and Contact Hours	
3 & 45	
Course Coordinator's Name	
Ms .M.Jasmin	
Text Books and References	
<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. D.Roy Choudhry,Shail Jain,“Linear Integrated Circuits”, New Age International Pvt.Ltd.,2000. 2. Sergio Franco, “Design with Operational Amplifiers and Analog Integrated Circuits”, 3rdEdition, Tata Mc Graw-Hill, 2007. <p>REFERENCES</p> <ol style="list-style-type: none"> 1. Ramakant A.Gayakwad, “OP-AMP and LinearICs”,4thEdition, Prentice Hall Pearson Education , 2001. 2. Robert F.Coughlin,FrederickF.Driscoll,“Operational Amplifiers and Linear Integrated Circuits”, Sixth Edition,PHI,2001 3. B.S.Sonde, “System design using Integrated Circuits” ,2ndEdition, New Age Pub, 2001 4. Gray and Meyer, “Analysis and Design of Analog Integrated Circuits”,Wiley International,2005 5. Michael Jacob,“Applications and Design withAnalog Integrated Circuits”,Prentice Hall of India, 1996. 6. William D.Stanley,“Operational Amplifiers with Linear Integrated Circuits”, Pearson Education,2004. 7. S.Salivahanan &V.S.Kanchana Bhaskaran, “Linear IntegratedCircuits”,TMH,20 	
Course Description	
<ul style="list-style-type: none"> • To understand the basic concepts of operational amplifier and its various applications. • To understand the basics of PLL and its practical applications. • To know about analog multipliers. • To know about various analog switches and different A/D and D/A convertors. • To understand the concepts of switched capacitor filters,Voltage regulator and various amplifiers 	
Prerequisites	Co-requisites
BEC302-Principles of Digital electronics	BEC402-Electronic Circuits
required, elective, or selected elective (as per Table 5-1)	
required	
Course Outcomes (COs)	
<p>CO1: Learn about the basic concepts for the circuit configuration for the design of linear integrated circuits and develops skill to solve engineering problems</p> <p>CO2 : Develop skills to design simple circuits using OP-AMP.</p> <p>CO3 : Gain knowledge about various multiplier circuits, modulators and demodulators.</p> <p>CO4 : Gain knowledge about PLL.</p> <p>CO5: Learn about various techniques to develop A/D and D/A convertors.</p> <p>CO6 : Develop skills to develop simple filter circuits and various amplifiers and can solve problems related to it.</p>	

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	A	b	c	d	E	F	g	h	i	J	K	
CO1		H				M						
CO2	M			H	M				M			
CO3	M	M	M		M							
CO4	M						M					
CO5		L		M	L		M		M	M		
CO6	M		M			H						

List of Topics Covered

UNIT I CIRCUIT CONFIGURATION FOR LINEAR ICs

9

Current mirror and current sources, Current sources as active loads, Voltage sources, Voltage References, BJT Differential amplifier with active loads, Operational Amplifier-- DC Characteristics-- Frequency response characteristics - Stability – Limitations--Frequency compensation-Slew rate.

UNIT II APPLICATION OF OPERATIONAL AMPLIFIERS

9

Integrator Voltage to Current convertor, Instrumentation amplifier, Sine wave Oscillators, Low pass and band pass filters, comparator, Multivibrator and Schmitt trigger, Triangle wave generator, Precision rectifier, Log and Antilog amplifiers, Non-linear Linear and Nonlinear Circuits using operational amplifiers and their analysis, Inverting and Non inverting Amplifiers, Differentiator function generator.

UNIT III ANALOG MULTIPLIER AND PLL

9

Analog Multiplier using Emitter Coupled Transistor Pair - Gilbert Multiplier cell – Variable transconductance technique, analog multiplier ICs and their applications ,Voltage controlled Oscillator, Closed loop analysis of PLL, AM, PM and FSK modulators and demodulators. Frequency synthesizers, Compander ICs.

UNIT IV ANALOG TO DIGITAL AND DIGITAL TO ANALOG CONVERTOR

9

Analog switches, High speed sample and hold circuits and sample and hold IC's, Types of D/A converter Current driven DAC, Switches for DAC, A/D converter, Flash, Single slope, Dual slope, Successive approximation, DM and ADM, Voltage to Time and Voltage to frequency converters.

UNIT V SPECIAL FUNCTION IC

9

Timers, Voltage regulators - linear and switched mode types, Switched capacitor filter, Frequency to Voltage converters, Tuned amplifiers, Power amplifiers and Isolation Amplifiers, Video amplifiers, Fiber optics ICs and Opto couplers, Sources of Noises, Op Amp noise analysis and Low noise OP-Amps.