

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT-3	Sheet No. 1/5
Branch	Electronics & Instrumentation		Semester	IV	
Course Code	402	Course Name	Linear Integrated Circuit		
Course Outcome 1	Explain the Pin, Symbols & block diagram of OP AMP, and state the definition of OP AMP parameters.		Teach Hrs	Marks	
Learning Outcome 1	Compare common mode and differential mode operation in differential amplifier and Explain the block diagram & internal characteristics of OP AMP circuit. (Cognitive)		10	10	
Contents	Introduction to Operational Amplifier : Differential amplifier: - Principle - differential and common mode of operation , concept of inverting and non- inverting input The Op-Amp: - Block Diagram, IC Packages ,Ideal characteristics				
Method of Assessment	External				
Learning Outcome 2	Interpret the following Electrical characteristics- Input offset voltage, Output offset voltage, CMRR, slew rate Gain & Bandwidth (Cognitive)		8	10	
Contents	OPAMP Electrical parameters : - Input offset voltage , Input resistance , CMRR ,Slew rate ,Gain , Bandwidth 741 OP- Amp characteristics, pin out and power supply requirements				
Method of Assessment	Internal				
Learning Outcome 3	Measurement of Different characteristics of an Op-Amp in open loop configuration. (Psychomotor)		6	10	
Contents	Measure Input Resistance, Output Resistance, Gain and Bandwidth of an Op-Amp in open loop configuration.				
Method of Assessment	External				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 2/5
Branch	Electronics & Instrumentation		Semester	IV	
Course Code	402	Course Name	Linear Integrated Circuit		
Course Outcome 2	Examine Various Linear Applications Of an OPAMP.			Teach Hrs	Marks
Learning Outcome 4	Use various configuration of OPAMP for Linear Application. (Cognitive)			8	10
Contents	Linear application of OPAMP Inverting amplifier , non-inverting amplifier ,Voltage follower , Adder and Subtractor , Differentiator ,integrator, Scaling Amplifier - AC and DC Amplifier - Instrumentation amplifier				
Method of Assessment	External				
Learning Outcome 5	Construct Basic Filters and Converters using Op Amp. (Cognitive)			8	10
Contents	Active filters: low pass, high pass and band pass ,Voltage to Current converter - Current to Voltage converter				
Method of Assessment	External				
Learning Outcome 6	Setup and Demonstrate different linear applications of OPAMP on kits / simulation software. (Psychomotor)			6	10
Contents	Construct Inverting and Non Inverting Amplifier. Construct Adder, Subtractor, Differentiator and Integrator using OPAMP. Construct Basic Filters using OPAMP.				
Method of Assessment	External				

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 3/5
----------------------------	--	--------------------------------------	--	------------------	---------------

Branch	Electronics & Instrumentation		Semester	IV
Course Code	402	Course Name	Linear Integrated Circuit	
Course Outcome 3	Examine Various Non Linear Applications Of an OPAMP		Teach Hrs	Marks
Learning Outcome 7	Use various configuration of OPAMP for Non Linear Application. (Cognitive)		8	10
Contents	Non Linear application of OPAMP Comparators: functions of a comparator, modes of operation of comparator, Open loop- zero crossing detector Schmitt trigger: Threshold levels, Inverting and non-inverting, Hysteresis curve Converters: Voltage to Frequency Conversion, Frequency to Voltage Conversion			
Method of Assessment	External			
Learning Outcome 8	Describe the concept of feedback and compare different types of oscillator circuits using OP Amp (Cognitive)		8	10
Contents	Sample / Hold circuit, Precision Rectifier, Oscillators: Wein Bridge Oscillator, Phase shift Oscillator, Relaxation Oscillator Logarithmic amplifier and antilogarithmic amplifier, Basics of analog multiplier and dividers			
Method of Assessment	Internal			
Learning Outcome 9	Setup and Demonstrate different Non linear applications of OPAMP on kits / simulation software. (Psychomotor)		6	10
Contents	Demonstrate the Operation Of Sample & Hold Circuit using OPAMP. Examine different Oscillator circuit.			
Method of Assessment	Internal			

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 4/5
Branch	Electronics & Instrumentation		Semester	IV	

Course Code	402	Course Name	Linear Integrated Circuit	
Course Outcome 4	Distinguish the working of OP AMP as series and shunt voltage regulator		Teach Hrs	Marks
Learning Outcome 10	Illustrate the working of Regulator using Transistor.(Cognitive)		8	10
Contents	Transistor Voltage Regulators Power supply characteristics, Need of Regulators, Series Regulator Shunt Regulator, Pass Transistor Regulator, Switching Regulator.			
Method of Assessment	External			
Learning Outcome 11	Illustrate the working of Regulator using OPAMP.(Cognitive)		8	10
Contents	Op-Amp Voltage Regulators Op-Amp Series voltage Regulator IC voltage regulator. Basics of Regulator ICs like 723, LM317,78XX , 79XX and SMPS TEA1507, TEA152X series			
Method of Assessment	Internal			
Learning Outcome 12	Construct and Observe various Regulator Circuit using OPAMP. (Psychomotor)		6	10
Contents	Construct and Observe Series Regulator using OPAMP. Construct and Observe Shunt Regulator using OPAMP. Construct and Observe Switching Regulator using OPAMP			
Method of Assessment	Internal			

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- 3	Sheet No. 5/5
Branch	Electronics & Instrumentation			Semester	IV
Course Code	402	Course Name	Linear Integrated Circuit		
Course Outcome 5	Describe the working and applications of IC 555 Timer and PLL.			Teach Hrs	Marks
Learning Outcome 13	Explain working and applications of 555 Timer. (Cognitive)			7	10
Contents	Timers Introduction, functional block diagram of a timer, 555 timer: operation modes of 555: Monostable and Astable, Pin configuration of 555 ,555 as wave generators: square wave, Saw tooth wave and Tri-angular Wave				
Method of Assessment	External				
Learning Outcome 14	Illustrate the Application Of PLL. (Cognitive)			7	10
Contents	Phase Lock Loop (PLL) functional block diagram, Lock & Capture range, transfer characteristics, Basic Applications of PLL 567, PLL 565, Applications of PLL				
Method of Assessment	External				
Learning Outcome 15	Use 555 Timeras Multivibrator. (Psychomotor)			6	10
Contents	Construct and test 555 Timer as Astable multivibrator. Construct and test 555 Timer as Monostable multivibrator. Generate Triangular Wave using 555 timer IC				
Method of Assessment	External				

Suggested List of Experiments*:

S.no	Experiments	CO
------	-------------	----

1.	Measure Input Resistance and Output Resistance of an OPAMP.	CO 401.1
2.	Measure Gain and Bandwidth of an OPAMP.	CO 401.1
3.	Construct Inverting and Non Inverting Amplifier using OPAMP.	CO 401.2
4.	Construct Adder , Subtractor, Differentiator and Integrator using OPAMP.	CO 401.2
5.	Construct Basic Filters using OPAMP.	CO 401.2
6.	Demonstrate the Operation Of Sample & Hold Circuit using OPAMP.	CO 401.3
7.	Examine different Oscillator circuit.	CO 401.3
8.	Construct and Observe Series Regulator using OPAMP.	CO 401.4
9.	Construct and Observe Shunt Regulator using OPAMP.	CO 401.4
10.	Construct and Observe Switching Regulator using OPAMP.	CO 401.4
11.	Construct and test 555 Timer as Astable multivibrator.	CO 401.5
12.	Construct and test 555 Timer as Monostable multivibrator.	CO 401.5
13.	Generate Triangular Wave using 555 timer IC.	CO 401.5

Ten experiments in a semester as per the discretion of the subject teacher.

Major Equipment/Materials:

1.	Cathode Ray Oscilloscope(CRO)/Digital Storage Oscilloscope(DSO)
2.	Dual Power Supply
3.	Function generator
4.	Digital/Analog Multimeter
5.	Breadboard, discrete components, wires
6.	Linear IC Trainer
7.	PLC Trainer
8.	SMPS Trainer

Suggestions for Practicals:

Experiments are expected to be performed

1. Using breadboard/trainer kits.
2. on simulation software (vizPSpice, TINA, Multisim, KiCAD, LTSpice, LabView, Simulink, Proteus, CircuitMaker etc.)
3. on virtual lab platforms available online (like: vlab.co.in, falstad.com/circuit etc.)

Reference Books/Web Portals:

S.NO.	Title	Author
1.	Op-Amps and Linear Integrated Circuits	R.A. Gayakwad
2.	Electronic Devices & Circuits	Robert Boylestad
3.	Principals of Electronics	V.K.Mehta
4.	Electronic Devices and Circuits	Millman&Halkias
5.	Operational Amplifiers and Integrated Circuits	Denton Daily
6.	Electronic Devices & CKTs	Mottershead
7.	Electronics Principles	Malvino
8.	nptel.ac.in	
9.	swayam.gov.in	