COURSE MATERIAL FOR B. TECH. 4TH SEMESTER ECE/ELE

ANALOG ELECTRONICS/ELECTRONICS-II

COURSE CODE: ECE-401 LTP: 310 CREDITS: 04

SYLLABUS

UNIT	CHAPTER	DESCRIPTION
I	Feedback Amplifiers	Negative feedback, effect of negative feedback on performance of amplifiers, e.g., bandwidth etc., types of feedback amplifiers,current-shunt, current-series, voltage-shunt, voltage-series feedback, analysis of feedback amplifier circuits.
II	Sinusoidal Oscillators	Basic operation, analysis of general oscillator circuit, Barkhausen criterion, various types of oscillator circuits and their analysis, design of practical oscillator circuits.
III	Power Amplifiers and Power Supplies	Classification of power amplifiers, class A, class B, class AB, and class C power amplifiers, analysis and design, power supplies and IC regulators.
IV	Operational Amplifiers	Operational amplifier stages, differential amplifier, CMRR, cascade amplifier, ideal and practical OPAMP, characteristics and properties, OPAMP applications, invrting and non-inverting OPAMP, difference amp., summer,diffrentiator and integrator, rectifiers etc., OPAMP in analog computation, frequency response, gain-bandwidth product, signal to noise ratio.
V	Multivibrators and Waveform Generators	Bistable, monostable and astable multivibrator circuits and their analysis, waveform generators, triangular and square wave generator.
VI	Logic Families	Introduction to DTL, TTL, ECL, RTL and CMOS logic families, pseudo-nMOS, pass transistor, CMOS inverter, static and dynamic operation, common CMOS logic gate circuits.

REFERENCES

Ref. No	TITLE	AUTHOR/S	PUBLISHER
R1	Integrated Electronics: Analog and Digital Circuits and Systems	J. Millman & C. Halkias	McGRAW-Hill

R2	Microelectronics Circuits	A.S. Sedra and K. C. Smith	Oxford University Press

COURSE MODULE/PLAN

UNIT	UNIT NAME	TOPICS	REFERENCES	NEPTEL VIDEO LINK
I	Feedback amplifiers	-Amp. Classification: voltage, current, trans-conductance and trans-resistance amplifiers; -Feedback concept; -Transfer gain with feedback; -Characteristics of negative feedback; -Effect of feedback on input resistance and output resistance; -Method of analysis of F/B amplifier; -Analysis of voltage-series F/B, example; -Current-series F/B, example; -Current-shunt F/B, example; -Voltage-shunt F/B, example;	Sec 13-1 [R1] Sec 13-2 [R1] Sec 13-3 [R1] Sec 13-4 [R1] Sec 13-4 &13-6 [R1] Sec 13-7 [R1] Sec 13-8/9 [R1] Sec 13-10[R1] Sec 13-11[R1] Sec 13-12[R1]	https://nptel.ac.in/courses/117101106/ Lecture 17 and 18 Feedback Amplifiers By Dr. A. N. Chandorkar ELE Deptt. IIT Bombay See also nptel lectures of Prof. D. C. Dube IIT Delhi and Prof. Radhakishna Rao IIT Madras
II	Sinusoidal Oscillators	-Introduction, Barkhausen criterion; -Phase shift oscillator[FET as well as transistor], variable operation; -Resonant-circuit oscillators, Tuned-collector oscillator; -General form of oscillator circuit, Colpits and Hartley oscillators; -Wein Bridge oscillator; -Crystal oscillators;	Sec 14-15[R1] Sec 14-16[R1] Sec 14-17[R1] Sec 14-18[R1] Sec 14-19[R1] Sec 14-20[R1]	https://nptel.ac.in/courses/117101106/ Lecture 23 and 24 Feedback Amplifiers By Dr. A. N. Chandorkar ELE Deptt. IIT Bombay
III	Power Amplifiers and Power Supplies	-Class A large signal amplifiers; -Second-harmonic distortion, higher harmonics; -Transformer-coupled audio power amp., impedance matching, max. Power output, efficiency; -Push-pull amplifiers, class B amplifiers;	Sec 18-1[R1] Sec 18-2/3[R1] Sec 18-4/5[R1] -Sec 18-6/7[R1]	https://nptel.ac.in/courses/117103063/ Module 5 Lecture 1 to 5 Operational Amplifier By Dr. Chitralekha Mahanta ECE Deptt. IIT Guwhati

		-Class AB operation; -Regulated power supplies; -Series regulators; -Monolithic[IC] regulators;	Sec 18-8[R1] Sec 18-9[R1] Sec 18-10[R1] Sec 18-11[R1]	
IV	Operational Amplifiers			https://nptel.ac.in/courses/117103063/ Module 4 Lecture 1 to 8 Operational Amplifier By Dr. Chitralekha Mahanta ECE Deptt. IIT Guwhati

REFERENCE LINKS

https://idoc.pub/download/millman-halkias-integrated-electronicspdf-pnxkgrdqox4v
https://slideplayer.com/slide/13022705/
https://www.slideshare.net/Tony_01/14-feedback-amp-oscillator-circuits
https://www.cs.tut.fi/kurssit/TLT-8016/Chapter9.pdf
https://rmd.ac.in/dept/eee/sp/3/EDC/unit5.pdf
https://web.stanford.edu/class/archive/engr/engr40m.1178/slides/opamps.pdf
https://www.scribd.com/presentation/128210073/operational-amplifier-Ppt