

S.E. (ELECTRONICS) SEMESTER IV

ELECTRONIC CIRCUITS ANALYSIS AND DESIGN

Period per week	Lecture	4	
	Practical	2	
	Tutorial	---	
		Hours	Marks
Evaluation System	Theory Examination	3	100
	Practical	3	50
	Oral Examination	----	25
	Term Work	---	25
	Total	---	200

Detailed Syllabus		Lectures/Week
1	Frequency Response of Amplifiers High frequency parameters of BJT. Amplifier Frequency Response, System Transfer Functions, S – Domain Analysis, First – Order Functions, Bode Plots, Short–Circuit and Open–Circuit Time Constants, high Frequency Response of BJT, FET and MOSFET amplifier analysis.	09
2	OSCILLATORS- Analysis and Design of phase shift, Quadrature, Wien bridge, Hartley, Colpitt and Crystal Oscillator.	09
3	Power Amplifiers Power Amplifiers, Power Transistors – Power BJTs, Power MOSFETs, , Design of Class- A, Class- AB Push Pull Class- B Transformer Coupled Push Pull Amplifier, Complementary Class B Power Amplifier. Heat Sinks, Design of heat sinks, for power Amplifier Devices	09
4	Differential Amplifiers BJT, FET & MOSFET Differential Amplifier Analysis and Design, Design of CMOS, Differential Amplifier with Active Load (Ref:- Donald Neamen).	09
5.	Multistage Amplifiers Design Two Stage BJT, JFET and MOSFET Amplifiers and Design of CASCODE Amplifiers. Design of BJT-JFET hybrid amplifier.	12

6.	<p>Feedback and Stability Introduction to Basic Feedback Concepts, Ideal Close–Loop Gain, Gain Sensitivity Bandwidth Extension, Noise Sensitivity, Reduction of NonlinearDistortion, Ideal Feedback Topologies. Analysis of Series –Shunt, Series–Series, Shunt–Shunt Shunt – Series Amplifiers, Loop Gain, Stability of the Feedback Circuit, The Stability Problem, Bode Plots Of One – Pole, Two – Pole, and Three – Pole Amplifiers,Nyquist Stability Criterion, Phase and Gain Margins, Frequency Compensation Basic Theory, Closed Loop Frequency Response, Miller Compensation.</p>	08
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Text Books:

1. Microelectronics Circuits (Analysis and Design) By Mohammad Rashid, Cengage Learning
2. Donald A. Neamen, Electronic Circuit Analysis and Design, Second edition, McGraw Hill International edition 2001
3. Martin Roden , Gordon Carpenter, William Wieserman, Electronic Design, Fourth edition, Shroff Publishers,2002

Reference Books:

1. Donald Schilling & Charles Belove, Electronic Circuits Discrete and Integrated, Third edition, McGraw Hill International edition, 1989
2. Adel Sedra & Kenneth Smith, Microelectronic Circuits, Fourth edition, Oxford University Press, 1998

Termwork:

The term work shall consist of atleast six laboratory experiments covering the whole of syllabus, duly recorded and graded as well as at-least four computer simulations using EDA tools like PSPICE duly recorded and graded. This will carry a weightage of fifteen marks. A test shall be conducted and will carry a weightage of ten marks.

SUGGESTED LIST OF EXPERIMENTS

Laboratory / Simulations

1. To Study frequency Response of Cascode Amplifier
2. To study RC phase shift Oscillator and Calculate threshold & practical frequency.
3. To Study Current Series negative feedback amplifier and plot gain with

feedback & without feedback.

4. To study Wein Bridge Oscillator
5. To study Class AB and B Pushpull Amplifier.
6. To study Hartley Oscillator. Calculate theoretical & practical frequency.
7. To study Colpitts Oscillator. Calculate theoretical & practical frequency.
8. To study frequency response of two stage RC coupled Amplifier.

