

4160-S CIRCUIT DESIGN										
Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)					
Lectures	Practical	Credit			Theory		Practical Ex.		Total	
3	2	5	25	25	3 Hrs	100	-		150	
Pre-requisite		Source	Semester		Theory	Test	Total	TW	PR	Gr Total
4132		EXN			-	-	-	50	100	150

Rationale: This course is intended to create capabilities to analyse circuits encountered in Basic Electronics and Devices. This also helps in acquiring experience in the design of the basic circuits in Electronics Course.

COURSE CONTENTS		Hrs	Mks
1. INTRODUCTION TO COMPONENT SELECTION		10	20
Resistors: Resistors types, variable resistors, colour coding, power ratings, choosing the resistors for a circuit, resistor faults.			
Inductors: Self-inductance, mutual inductance, and calculation of turns and core area for a given inductance. Inductive reactance, Q of a core, applications with examples.			
Capacitors: Typical capacitors colour coding, charging and discharging of a capacitor. Capacitive reactance, Time constant, applications with examples, capacitor faults.			
Transformer: Single-phase step up, step down transformer. Types of cores core losses, calculations of primary and secondary turns and core area for 50Hz-power supply. Typical applications with examples.			

2. POWER SUPPLY

14 30

Designing half wave rectifier, Full wave rectifier for specified voltage and power. Use of simple filters in rectifiers. Applications with examples. Designing a zener regulator for specified output values. Study of IC 723 regulator, designing of Series regulators for giving o/p voltages and power. ~~Concept in discrete and integrated modes. Calculations and design considerations.~~ Switching regulator ~~concepts.~~ Design of HW and FW controlled rectifier (RC phase shift NW) using SCR for a given voltage and firing angles. ~~Design of controlled Power supply using Triac for light dimmer and motor speed control.~~

3. AMPLIFIERS

12 25

Design of biasing circuits for a single stage typical amplifier. Stability factor. Design of discrete ~~and integrated~~ power amplifier. Design of typical multistage RC amplifier for specified voltage and currents.

4. OSCILLATORS

12 25

Designing of RC phase shift Oscillators for a specified frequency and voltage. Designing a stable multi-vibrator using transistors and IC 555, for a specified frequency and voltage. Designing a relaxation oscillator using UJT ~~and BJT~~ for a specified saw-tooth voltage and frequency. Designing, integrating and differentiating circuit using RC components. ~~and key.~~

Total

48 100

PRACTICALS: (Any 6)

(No. Of turns)

1. Designing a zener regulator for specified I, V, P ratings. (2)
2. Designing of 723 regulator for specified ratings. (2)
3. Designing of a single stage amplifier circuit for specified ratings. (2)
4. Designing of a multistage RC amplifier circuit for specified (3)
5. Performance / ratings (3)
6. Designing of RC phase shift oscillator for a specified frequency and voltage. (2)
7. Designing of Astable Multivibrator using transistor and IC 555 for a specified frequency and voltage. (2)
8. Designing of UJT relaxation oscillator for a specified sawtooth voltage and frequency (2)
9. Designing Integrator / Differentiator circuits for specified performance (3)
10. Parameters. (3)

REFERENCE BOOKS:

1. Transistor Approximations by Malvino.
2. Electronic Devices and Circuits by Louis Neshelkey

