BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani
Pilani Campus
AUGS/ AGSR Division

SECOND SEMESTER 2020-21
COURSE HANDOUT

Date: 16.01.2021

In addition to part I (General Handout for all courses appended to the Time Table) this portion gives further specific details regarding the course.

Course No : **EEE/INSTR F341**
Course Title : **Analog Electronics**
Instructor-in-Charge : **V K CHAUBEY**
Instructor(s) : **Arnab Hazra**
Tutorial/Practical Instructors: Pankaj Arora, Satyendra K Mourya , Sharda Tripathi, Devesh Samaiya, Ritish Kumar, Ankita Dixit ,Ashish Kumar Verma, Teena Gakhar , Sabhavi Shukla, Prem Sai Regalla, Pavitra Sharma

1. Course Description: Introduction to operational amplifiers: The difference amplifier and the ideal operational amplifier models, concept of negative feedback and virtual short; Analysis of simple operational amplifier circuits; Effects of real operational amplifier parameters on circuit performance. Linear applications of operational amplifiers: Instrumentation and Isolation amplifiers; Current and voltage sources; Active filters. Non-linear applications of operational amplifiers: Comparators; Linearization amplifiers; Logarithmic amplifiers, multifunction modules & circuits, true rms convertors, Precision and signal conditioning circuits, Waveform Generation: sinusoidal and non-sinusoidal signal generation; Wave shape converters. Timer 555 based circuits, Phase lock loop circuits & applications, IC regulators, Output stage and large signal amplifiers, Power amplifiers, Tuned amplifiers, Analog and Digital interface circuits: A/D, D/A Converters.

2. Scope and Objective of the Course: The aim of the course is to deal with various electronic techniques and building blocks used in analog signal processing and conditioning. Various discrete and integrated electronic circuits used in analog system design will be studied. Experiments and projects using discrete IC modules will be carried out in the laboratory.

3. Text Books:TB1 L.K. Maheshwari, Analog Electronics, PHI,2005
TB2 L.K. Maheshwari and M.M.S. Anand, Laboratory Experiments & PSPICE Simulation in Analog Electronics Experiments, PHI, 2005.

4. Reference Books:A.S. Sedra, K.C. Smith, Microelectronic Circuits, 6th Ed., Oxford International Student Edition, 2013

5. Course Plan:

Module No.	Lecture Session	Reference	Learning outcomes
1 (L1-L2)	Introduction & Review of Concepts	TB1 Ch 1	Basics of analog circuits
2(L3-L5)	Op-amp basics	TB1 Ch circuits	2Ideal and real model opamp based

3 (L6-L9)	**Special purpose opamp circuits**	**TB1 Ch 3**	**Opamp based circuits and inductor simulation**
4 (L10-L14)	**Filters**	**TB1 Ch 4, R1Ch.11**	**Active filter design and realization**
5 (L15-L18)	**Non-linear Op-amp circuits**	**R1,TB1 Ch 5**	**Multiplier application ,Precision circuits**
6(L19-L26)	**Signal Sources & Phase lock loop**	**TB1 Ch 6**	**Timer based circuits, Oscillators, PLL**
7(L27-L32)	**Voltage Regulators**	**TB1 Ch 7**	**Linear and switched regulators, ICs concepts**
8(L33-L35)	**IC Power Amplifiers**	**TB1 Ch 8**	**Class A,B,C and AB stages and LM 380 concepts**
9(L36-L37)	**Tuned Amplifiers**	**TB1Ch 9, R1. 11.11**	**Tuned amplifier design**
10(L38-L40)	**Data Converters**	**TB1Ch10, R1Ch10.9-10.11**	**Concepts of D/A and A/D converters**

6. Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of component (Close Book/ Open Book)
Tutorials	10 Min	13.3 (40)	Regular	OB
Mid-Semester Test	90 Min.	25 (75)		OB
Lab Day/day (50) Lab Compre (20) Lab Quiz (15)		28.3 (85)		
Comprehensive Examination	2 hrs	33.3 (100)		OB/CB

7. Chamber Consultation Hour: Will be notified through notice.

8. Notices: Nalanda

9. Make-up Policy: Make-up will be given on extremely genuine grounds only. Prior application should be made for seeking the make-up examination.

10. Note (if any): Will be announced from time to time.

Instructor-in-charge
Course No. EEE/INSTR F341