Semester Plan
(Theory)

TCET/FRM/IP-02/09 **Revision: A**

Semester: V **Course: ETRX**

Subject: EXC- 502: Design With Linear Integrated Circuits **Class: TE ETRX**

S.No.	Prerequisite/ Bridge course:	Duration (Week /Hrs)	Modes of Learning	Recommended Sources
1	Basic Electrical & Electronics Engineering ,Electronic Devices, Digital Circuits and Design , Discrete Electronic Circuits	6 hours	Self Learning/ Revision	**Textbooks:** 1. EDC by R.Boylestad2. DCD by R.P.Jain 3.EDC by Donald Neamen

Class Room Teaching

Sr. No	Module No.	Lesson No	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
1	Module 1	L1.1	Introduction to IC technology	Power point presentation, Chalk & Board	07-12-2017	1.1	
2	Module 1	L1.2	OBE	Chalk & Board, Power point presentation,	07-12-2017	_	
3	Module 1	L1.3	Ideal Op Amp, characteristics of op-amp, op-amp parameters,	Chalk & Board, Power point presentation,	13/7/2017	1.7	
4	Module 1	L2,1	high frequency effects on op-amp gain and phase, slew rate limitation	Chalk & Board, Power point presentation,	18/7/2017	1.8	
5	Module 1	L2.2	Practical determination of op-amp parameters,single supply versus dual supply op-amp	Chalk & Board, Power point presentation,	19/07/2017	1.8	
6	Module 1	L2.3	loop and closed loop configurations, Inverting and non-inverting amplifier	Chalk & Board, Power point presentation,	19/07/2017	1.9-1.10	
7	Module 2	L2.4	Adder, subtractor	Chalk & Board, Power point presentation,	20/07/17	2.7	
8	Module 2	L3.1	Integrator, differentiator, current amplifier, difference amplifier	Chalk & Board	24/07/17	2.8-2.9	
9	Module 2	L3.2	Numericals based on above topics	Chalk & Board,	27/07/17	_	
10	Module 2	L3.3	Instrumentation amplifier and application of Op-Amp in transducer measurement system with detail design	Chalk & Board, Power point presentation,	28/7/2017	2.1	
11	Module 2	L3.2	Single supply DC biasing techniques for inverting, non-inverting and differential amplifiers.	Chalk & Board, Power point presentation,	28/7/2017	2.11	

12	Module 2	L4.1	Converters: Current to voltage and voltage to current converters, generalized impedance converter	Chalk & Board,Power point presentation,	31/7/2017	2.12-13	
13	Module 2	L4.2	Active Filters: First order filters, second order active finite and infinite gain	Power point presentation, Chalk & Board	08-03-2017	2.14	
14	Module 2	L4.3	low pass, high pass filter design	Chalk & Board, Power point presentation,	08-04-2017	2.14.1-2	
15	Module 2	L4.4	Band pass and band reject filters	Chalk & Board, Power point presentation,	08-04-2017	2.14.3-5	
16	Module 2	L5.1	Numericals based on above topics	Chalk & Board, Animation	08-07-2017	–	
17	Module 2	L5.2	Sine Wave Oscillators:Introduction , RC phase shift oscillator, Wien bridge oscillator, Quadrature oscillator	Chalk & Board, Power point presentation,	08-10-2017	2.15	
18	Module 3	L5.3	Comparators: Inverting comparator, non-inverting comparator, zero crossing detector	,Chalk & Board	08-11-2017	3.8	
19	Module 3	L5.4	window detector and level detector	Chalk & Board,	08-11-2017	3.8.1	
20	Module 3	L6.1	Schmitt Triggers: Inverting Schmitt trigger, non-inverting Schmitt trigger with adjustable threshold levels	Chalk & Board,	14/8/2017	3.9	
21	Module 3	L6.2	Waveform Generators: Square wave and triangular wave generator with duty cycle modulation	Chalk & Board,	18/8/2017	3.10 a-b	
22	Module 3	L6.3	Numericals based on above topics	Chalk & Board,	18/8/2017	–	
23	Module 3	L7.1	Half and full wave precision rectifiers and their applications	Chalk & Board, Power point presentation,	24/8/2017	3.9.1-4	
23	Module 3	L8.1	Half and full wave precision rectifiers and their applications	Power point presentation, Chalk & Board	31/8/2017	3.9.5	
24	Module 4	L8.2	Peak detectors, sample and hold circuits, voltage to frequency converter,	Chalk & Board, Power point presentation,	09-01-2017	3.10-11	
25	Module 3	L8.3	logarithmic converters and antilog converters	Chalk & Board, Animation	09-01-2017	3.12-3.13	
26	Module 3	L9.1	Revision and problem solving	Chalk & Board,	09-04-2017	–	
27	Module 4	L9.2	Performance parameters of ADC, single ramp ADC, ADC using DAC,	Chalk & Board, Power point presentation,	09-07-2017	4.7-4.8	

28	Module 4	L9.3	dual slope ADC, successive approximation ADC, flash ADC,	Chalk & Board, Power point presentation,	09-08-2017	4.9-4.10	
29	Module 4	L9.4	Performance parameters of DAC, binary weighted register DAC, R/2R ladder DAC	Chalk & Board, Power point presentation,	09-08-2017	4.11	
30	Module 4	L10.1	inverted R/2R ladder DAC, DAC0808 and its interfacing	Power point presentation, Chalk & Board	09-11-2017	4.11	
29	Module 5	L10.2	Functional block diagram, working of IC555	Chalk & Board, Power point presentation,	14/9/2017	5.9	

30	Module 5	L10.3	design and applications of Timer 555.Astable and monostable operation	Chalk & Board, Power point presentation,	15/9/2017	5.10-5.11	
31	Module 5	L10.4	Functional block diagram, working and applications of VCO 566,	Chalk & Board, Power point presentation,	15/9/2017	5.13	
32	Module 5	L11.1	PLL 565, multiplier 534,	Chalk & Board, Animation	18/9/2017	5.12	
33	Module 5	L11.2	waveform generator XR 2206, power amplifier LM380	Chalk & Board, Animation	21/9/2017	5.14-5.14	
35	Module 6	L11.3	Functional block diagram, working and design of three terminal fixed (78XX, 79XX series)	Chalk & Board, Power point presentation,	22/9/2017	6.9-6.10	
36	Module 6	L11.4	three terminal adjustable (LM 317, LM 337) voltage regulators	Chalk & Board, Animation	22/9/2017	6.11	
37	Module 6	L12.1	Functional block diagram, working and design of general purpose 723 regulator	Chalk & Board, Power point presentation,	25/9/2017	6.12	
38	Module 6	L13.1	(LVLC, LVHC, HVLC and HVHC) with current limit and current fold-back protection	Chalk & Board, Power point presentation,	10-05-2017	6.13	
39	Module 6	L13.2	Switching regulator topologies, functional block diagram and working of LT1070 monolithic switching regulator	Chalk & Board, Power point presentation,	10-06-2017	6.14	
40	Module 5	L13.3	Numericals based on IC 555	Power point presentation, Chalk & Board	10-06-2017	5.11	
41	Module 6	L14.1	Design problems on IC 723	Chalk & Board,	10-12-2017	6.11	
42	Module 6	L14.2	Design problems on IC 723	Chalk & Board,	13/10/2017	6.11	
43	Module3	L14.3	Design problems on Filters	Chalk & Board,	13/10/2017	2.14	
44	Module 3	L15.1	Deign Problems on Filters	Chalk & Board,	16/10/2017	2.14	
45	All Modules	L15.2	Revision and problem solving	Chalk & Board,	16/10/2017	_	
46	Selected Module	L15.3	Content beyond Syllabus-Video Lectures and discussion	Power point presentation, Chalk & Board	17/10/2017	_	
47	Selected Module	L15.4	Content beyond Syllabus-Video Lectures and discussion	Chalk & Board, Animation	17/10/2017	_	
48	All Modules	SAT	University paper Solving	Chalk and Board	29/7/2017	_	
49	All Modules	SAT	University paper Solving	Chalk & Board	08-05-2017	_	
50	All Modules	SAT	Practical exam orientation and Viva questions discussion	Chalk & Board,	08-05-2017	_	

Remark: Course:	Syllabus Coverage:	Practice Session: 3	**Content Beyond Syllabus:** Video Lectures based on IC technology**,** Small Projects based on Texas Kits

* Two working saturdays

No. of (lectures planned)/(lecture taken): 50

Advanced course: Analog Integrated Circuts	20 Hours	Online NPTEL videos with Hands on Training in Laboratory	**Web sources:** 1. NPTEL-https://onlinecourses.nptel.ac.in **Textbook reference:** 1. Design with operational amplifiers and analog integrated circuits

Text Books:

1. Sergio Franco, "Design with operational amplifiers and analog integrated circuits", Tata McGraw Hill, 3rd Edition.
2. William D. Stanley, "Operational Amplifiers with Linear Integrated Circuits ", Pearson, 4th Edition
3. D. Roy Choudhury and S. B. Jain, "Linear Integrated Circuits", New Age International Publishers, 4th Edition.
4. David A. Bell, "Operation Amplifiers and Linear Integrated Circuits", Oxford University Press, Indian Edition.
5. Ramakant A. Gayakwad, "Op-Amps and Linear Integrated Circuits", Pearson Prentice Hall, 4th Edition.
6. R. P. Jain, "Modern Digital Electronics," Tata McGraw Hill, 3rd Edition.
7. J. Millman and A. Grabel, "Microelectronics", Tata McGraw Hill, 2nd Edition.

Digital Reference:

www.nptel.ac.in

Name & Signature of Faculty Signature of HOD Signature of Principal /Dean (Academics)

Date: Date: Date:

Note:

1. Plan date and completion date should be in compliance
2. Courses are required to be taught with emphasis on resource book, course file, text books, reference books, digital references etc.
3. Planning is to be done for 15 weeks where 1st week will be AOP, 2nd -13th for effective teaching and 14th -15th week for effective university examination oriented teaching, mock practice session and semester consolidation.
4. According to university syllabus where lecture of 4 hrs/per week is mentioned minimum 55 hrs and in case of 3 lectures per week minimum 45 lectures are to be engaged are required to be engaged during the semester and therefore accordingly semester planning for delivery of theory lectures shall be planned.
5. In order to improve score in NBA, faculty members are also required to focus course teaching beyond university prescribed syllabus and measuring the outcomes w.r.t learning course and programme objectives.
6. Text books and reference books are available in syllabus. Here only additional references w.r.t. non –digital/ digital sources can be written (if applicable)
7. Technology to be used in class room during lecture shall be written below the topic planned within the bracket.