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

Semester Plan
(Theory)

Semester: V Course: EXTC

Subject: Integrated Circuits Class: TE- A

Sr. No.	Bridge courses/Technology	Duration (Week/hrs)	Modes of Learning	Recommended Sources
1.	**Prerequisite course:** Basics of diode, differential amplifier Fundamentals of Op-amp	6 hrs	Self learning and classroom revision	1. D. A. Neamen, "Electronic Circuit Analysis and Design," Tata McGraw Hill, 2ndEdition. 2. Ramakant Gayawad, Operational Amplifier designing & Applications

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			**SOP** IC (Th)	LCD Projector	10/07/17		
2			**SOP** IC(OBE)	LCD Projector	11/07/17		
3			**SOP** CEL- I (Lab)	LCD Projector	12/07/17		
4	1		Fundamentals of Op-amp	LCD Projector	13/07/17	M1.1	
5	1	1.1	Review of Operational Amplifier Operational amplifier overview: parameters	LCD Projector	14/07/17	M1.2	
6	1	1.1	Open loop configurations Closed loop configurations	LCD Projector	17/07/17	M1.3	
7	2	2.1	**Applications of Op-Amp Amplifiers:** Current amplifier, difference amplifier amplifier	LCD Projector	18/07/17	M2.1	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
8	2	2.1	Instrumentation amplifier	LCD Projector & Black Board	19/07/17	M2.2	
9	2	2.1	Programmable gain amplifier	LCD Projector & Black Board	21/07/17	M2.3	
10	2	2.2	**Converters:** Current to voltage converters, voltage to current converters,	LCD Projector & Black Board	24/07/17	M2.4	
11	2	2.2	Generalized impedance converter	LCD Projector & Black Board	25/07/17	M2.5	
12	2	2.2	Voltage to frequency converter, Frequency to voltage converter	LCD Projector & Black Board	26/07/17	M2.6	
13	2	2.2	Logarithmic converters and antilog converters	LCD Projector & Black Board	28/07/17	M2.7	
14	2	2.3	**Active Filters:** Second order active finite and infinite gain low pass	LCD Projector & Black Board	31/07/17	M2.8	
15	2	2.3	Second order active finite and infinite gain high pass filters	LCD Projector & Black Board	1/08/17	M2.9	
16	2	2.3	Band pass and Band reject filters	LCD Projector & Black Board	2/08/17	M2.10	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
17	2	2.4	**Sine Wave Oscillators:** RC phase shift oscillator	LCD Projector & Black Board	4/08/17	M2.11	
18	2	2.4	Wien bridge oscillator, Quadrature oscillator	LCD Projector & Black Board	7/08/17	M2.12	
19	3	3.1	**Non-Linear Applications of Operational Amplifier 10 Comparators:** Inverting comparator, non-inverting comparator	LCD Projector & Black Board	8/08/17	M3.1	
20	3	3.1	Zero crossing detector, window detector and level detector	LCD Projector & Black Board	9/08/17	M3.2	
21	3	3.2	**Schmitt Triggers:** Inverting Schmitt trigger, non-inverting Schmitt trigger	LCD Projector & Black Board	11/08/17	M3.3	
22	3	3.2	Adjustable threshold levels	LCD Projector & Black Board	14/08/17	M3.4	
23	3	3.3	**Waveform Generators:** Square wave generator	LCD Projector & Black Board	16/08/17	M3.5	
24	3	3.3	Triangular wave generator, and Duty cycle modulation	LCD Projector & Black Board	18/08/17	M3.6	
25	3	3.4	**Precision Rectifiers:** Half wave Precision Rectifiers	LCD Projector & Black Board	30/08/17	M3.7	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
26	3	3.4	Full wave Precision Rectifiers, and applications	LCD Projector & Black Board	30/08/17	M3.8	
27	3	3.5	Peak detectors, sample and hold circuits	LCD Projector & Black Board	01/09/17	M3.7	
28	4	4.1	**Special Purpose Integrated Circuits** Functional block diagram &working of Timer 555	LCD Projector & Black Board	4/09/17	M4.1	
29	4	4.1	Design and applications of Timer 555	LCD Projector & Black Board	6/09/17	M4.2	
30	4	4.2	Functional block diagram, working and applications: VCO 566	LCD Projector & Black Board	8/09/17	M4.3	
31	4	4.2	Functional block diagram, working and applications: PLL 565	LCD Projector & Black Board	11/09/17	M4.4	
32	4	4.2	Functional block diagram, working and applications: Multiplier 534	LCD Projector & Black Board	12/09/17	M4.5	
33	4	4.2	Functional block diagram, working and applications: Waveform generator XR 2206,	LCD Projector & Black Board	13/09/17	M4.6	
34	4	4.2	Functional block diagram, working and applications: Power amplifier LM380	LCD Projector & Black Board	15/09/17	M4.7	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
35	5	5.1	**Voltage Regulators** Functional block diagram, working and design of three terminal fixed (78XX, 79XX series)	LCD Projector & Black Board	18/09/17	M5.1	
36	5	5.1	Three terminal adjustable voltage regulators (LM 317, LM 337)	LCD Projector & Black Board	19/09/17	M5.2	
37	5	5.2	Functional block diagram, working and design of general purpose 723 (LVLC,LVHC) with current limit and current fold-back protection	LCD Projector & Black Board	20/09/17	M5.3	
38	5	5.2	Functional block diagram, working and design of general purpose 723 (HVLC,HVHC) with current limit and current fold-back protection	LCD Projector & Black Board	22/09/17	M5.4	
39	5	5.2	Switching regulator topologies	LCD Projector & Black Board	25/09/17	M5.5	
40	5	5.2	Functional block diagram and working of LT1070 monolithic switching regulator	LCD Projector & Black Board	26/09/17	M5.6	
41	6	6.1	**Counters, Shift Registers and ALU** **MSI Counters:** Ripple counters (7490 decade, 7492 modulus-12, 7493 4-bitbinary)	LCD Projector & Black Board	3/10/17	M6.1	
42	6	6.1	synchronous counters (74162 decade, 74163 4-bit binary, 74169 4-bit up/down binary)	LCD Projector & Black Board	3/10/17	M6.1	
43	6	6.2	**MSI Shift Registers:** 74164 serial input parallel output, 74166 parallel input serial output	LCD Projector & Black Board	4/10/17	M6.2	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
44	6	6.2	Serial input serial output, 74194 universal shift register	LCD Projector & Black Board	4/10/17	M6.2	
45	6	6.2	**Arithmetic Logic Unit:** 74181 ALU	LCD Projector & Black Board	6/10/17	M6.3	
46.			University paper doubt solving	LCD Projector & Black Board	13/10/17		
Remark:: Course:		Syllabus Coverage:		Practice Session:		Beyond Syllabus:	
No. of (lectures planned)/(lecture taken): (45)							

Bridge courses Objective: Bridging of gaps with respect to prerequisites and industry skills or to carryout research in signal processing field**. (20 Hrs / Semester / student)**

Sr . No.	Bridge courses/Technology	Duration (Week/hrs)	Modes of Learning	Recommended Sources
1	Advanced course: Analog Circuits and Systems through SPICE Simulation (NPTEL Course)	12 week	Technology Based learning	https://onlinecourses.nptel.ac.in/noc17_ec15/ 2. Mircoelectronic Circuits, Sedra and Smith 2) Design of Analog CMOS Integrated Circuits, Behzad Razavi

Text Books:

1) Ramakant Gayawad, Operational Amplifier designing & Applications
2) Sergio Franco, “Design with Operational Amplifiers and Analog Integrated Circuits”,Tata McGraw Hill, 3rd Edition
3) John F. Wakerly, “Digital Design – Principles & Practices”, Pearson Education, 3rd Edition

Reference Books:

1) J. Millman and A. Grabel, “Microelectronics”, Tata McGraw Hill, 2nd Edition.
2) D. Roy Choudhury and S. B. Jain, “Linear Integrated Circuits”, New Age International Publishers, 4th Edition

Digital Reference:

- Wikipedia
- Google
- *http://www.mkp.com*
- *http://sensin.unLedu/idc/index.html*

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(Ms. Anvita Birje)	**(Dr. Vinitkumar Dongre)**	**(Dr. R. R. Sedamkar)**
Name & Signature of Faculty	Signature of HOD	Signature of Principal /Dean (Academics)
Date: 19/07/17	Date: 19/07/17	Date: 19/07/17

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.