THAKUR
TRUSTS

Zagdu Singh Charitable Trust's (Regd.)

THAKUR COLLEGE OF ENGINEERING & TECHNOLOGY

(Approved by AICTE, Govt. of Maharashtra & Affiliated to University of Mumbai*)

(Accredited Programmes by National Board of Accreditation, New Delhi**)

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Shyamnarayan Thakur Marg, Thakur Village,
Kandivali (East), Mumbai - 400 101.

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tcet
ISO 9001 : 2008 Certified

*Permanent Affiliated UG Programmes : • Computer Engineering • Electronics & Telecommunication Engineering • Information Technology (w.e.f.: A.Y. 2015-16 onwards)
**1st time Accredited UG Programmes : • Computer Engineering • Electronics & Telecommunication Engineering • Information Technology
**2nd time Accredited UG Programmes : • Computer Engineering • Electronics & Telecommunication Engineering • Information Technology • Electronics Engineering (3 years w.e.f.: 01-07-2016)

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

Semester Plan
(Theory)

Semester: V   Course: EXTC

Subject: Integrated Circuits   Class: TE- B

S.No.	Bridge courses/Technology	Duration (Week/hrs)	Modes of Learning	Recommended Sources
1.	**Prerequisite course:** 1)Analog circuits 2)Basic Electrical circuits	06 Hours	Self learning	1) Operational Amplifiers & Linear Integrated Circuits: Theory and Application by James M. Fiore chapter: 1 pg 15-59 , chapter-2 pg 63-82

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			IC (Th)	LCD Projector	11/07/17		
2			**SOP (LAB)** IC	LCD Projector	12/07/17		
3			**SOP** CEL- I (OBE)	LCD Projector	12/07/17		

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
4	1		Fundamentals of Op-amp	LCD Projector	13/07/17	Ramakant Gayawad	
5	1	1.1	Review of Operational Amplifier Operational amplifier overview: parameters	LCD Projector	14/07/17	Ramakant Gayawad	2-hrs will be completed in practical sessions
6	1	1.1	Open loop configurations Closed loop configurations	LCD Projector	17/07/17	Ramakant Gayawad	2-hrs will be completed in practical sessions
7	2	2.1	**Applications of Operational Amplifier Amplifiers:** Current amplifier, difference amplifier amplifier	LCD Projector	18/07/17	Ramakant Gayawad	
Sr. No	**Modul e No.**	**Lesson No.**	**Topics Planned (Technology to be used)**	**Teaching Aids Required**	**Planned /Complet ion Date**	**Resource Book Reference**	**Remarks**
8	2	2.1	Instrumentation amplifier	LCD Projector	19/07/17	Ramakant Gayawad	
9	2	2.1	Programmable gain amplifier	LCD Projector	21/07/17	Ramakant Gayawad	
10	2	2.2	**Converters:** Current to voltage converters, voltage to current converters,	LCD Projector	24/07/17	Ramakant Gayawad	
11	2	2.2	Generalized impedance converter	LCD Projector	25/07/17	Ramakant Gayawad	
12	2	2.2	Voltage to frequency converter, Frequency to voltage converter	LCD Projector	26/07/17	Ramakant Gayawad	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
13	2	2.2	Logarithmic converters and antilog converters	LCD Projector	28/07/17	Ramakant Gayawad	
14	2	2.3	**Active Filters:** Second order active finite and infinite gain low pass	LCD Projector	31/07/17	Ramakant Gayawad	
15	2	2.3	Second order active finite and infinite gain high pass filters	LCD Projector	1/08/17	Ramakant Gayawad	12/16 So 4 hrs less is given to complete the topics.
16	2	2.3	Band pass and Band reject filters	LCD Projector	2/08/17	Ramakant Gayawad	
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	4/08/17	Ramakant Gayawad	
18	2	2.4	Wien bridge oscillator, Quadrature oscillator	LCD Projector	7/08/17	Ramakant Gayawad	
19	3	3.1	**Non-Linear Applications of Operational Amplifier 10 Comparators:** Inverting comparator, non-inverting comparator	LCD Projector	8/08/17	Ramakant Gayawad	
20	3	3.1	Zero crossing detector, window detector and level detector	LCD Projector	9/08/17	Ramakant Gayawad	
21	3	3.2	**Schmitt Triggers:** Inverting Schmitt trigger, non-inverting Schmitt trigger	LCD Projector	11/08/17	Ramakant Gayawad	
22	3	3.2	Adjustable threshold levels	LCD Projector	14/08/17	Ramakant Gayawad	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
23	3	3.3	**Waveform Generators:** Square wave generator	LCD Projector	16/08/17	Ramakant Gayawad	
24	3	3.3	Triangular wave generator, and Duty cycle modulation	LCD Projector	18/08/17	Ramakant Gayawad	
25	3	3.4	**Precision Rectifiers:** Half wave Precision Rectifiers	LCD Projector	30/08/17	Ramakant Gayawad	
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	01/09/17	Sergio Franco	
27	3	3.5	Peak detectors, sample and hold circuits	LCD Projector	04/09/17	Ramakant Gayawad	
28	4	4.1	**Special Purpose Integrated Circuits** Functional block diagram &working of Timer 555	LCD Projector	5/09/17	Ramakant Gayawad	
29	4	4.1	Design and applications of Timer 555	LCD Projector	6/09/17	Ramakant Gayawad	
30	4	4.2	Functional block diagram, working and applications: VCO 566	LCD Projector	8/09/17	Ramakant Gayawad	
31	4	4.2	Functional block diagram, working and applications: PLL 565	LCD Projector	11/09/17	Ramakant Gayawad	

Sr. No	Module No.	Lesson No.	Topics Planned (Technology to be used)	Teaching Aids Required	Planned /Completion Date	Resource Book Reference	Remarks
32	4	4.2	Functional block diagram, working and applications: Multiplier 534	LCD Projector	12/09/17	Ramakant Gayawad	
33	4	4.2	Functional block diagram, working and applications: Waveform generator XR 2206,	LCD Projector	13/09/17	Ramakant Gayawad	
34	4	4.2	Functional block diagram, working and applications: Power amplifier LM380	LCD Projector	15/09/17	Ramakant Gayawad	
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	18/09/17	Sergio Franco	
36	5	5.1	Three terminal adjustable voltage regulators (LM 317, LM 337)	LCD Projector	19/09/17	Ramakant Gayawad	
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	20/09/17	Sergio Franco	
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	22/09/17	Sergio Franco	
39	5	5.2	Switching regulator topologies	LCD Projector	21/09/17	Sergio Franco	
40	5	5.2	Functional block diagram and working of LT1070 monolithic switching regulator	LCD Projector	25/09/17	Sergio Franco	

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41	6	6.1	**Counters, Shift Registers and ALU** **MSI Counters:** Ripple counters (7490 decade, 7492 modulus-12, 7493 4-bitbinary)	LCD Projector	26/09/17	John F. Wakerly	
42	6	6.1	synchronous counters (74162 decade, 74163 4-bit binary, 74169 4-bit up/down binary)	LCD Projector	3/10/17	John F. Wakerly	
43	6	6.2	**MSI Shift Registers:** 74164 serial input parallel output, 74166 parallel input serial output	LCD Projector	4/10/17	John F. Wakerly	

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	6/10/17	John F. Wakerly	
45	6	6.2	**Arithmetic Logic Unit:** 74181 ALU	LCD Projector	13/10/17	John F. Wakerly	
46.			University paper doubt solving	LCD Projector	16/10/17		

Remark:: Course:	Syllabus Coverage:		Practice Session:	Beyond Syllabus:

No. of (lectures planned)/(lecture taken):
(45)
Note: If required additional lectures will be planned on working days.

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

S.No.	Bridge courses/Technology	Duration (Week/hrs)	Modes of Learning	Recommended Sources

1	**Advanced course:** Analog Circuits and Systems through SPICE Simulation (NPTEL Course)	20 Hours	Technology Based learning	https://onlinecourses.nptel.ac.in/explorer/search?category=ELEC_ENGG

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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Shastri Shailendra
Name & Signature of Faculty   Signature of HOD   Signature of Principal/
                                                            Dean (Academics)
Date: 10/07/17   Date: 10/07/17   Date: 10/07/17

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.