

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE OUTLINE TEMPLATE			
Course Title	INTEGRATED CIRCUITS LABORATORY- Section B		
Course Code	EELR13	No. of Credits	2
Department	Electrical and Electronics Engineering	Faculty	MIDHUN E K
Pre-requisite Course	EEPC17		
Course Coordinator			
E-mail	midhun@nitt.edu	Telephone No.	9995104566
Course Type	Essential Laboratory Requirement (ELR)		
COURSE OVERVIEW			
<p>A course in Integrated Circuits is an essential part of a well-rounded electrical engineering technology curriculum. The Integrated Circuits course introduces the concept and application of operational amplifiers, 555 timers and digital circuits. Since it is a two-credit course, the allocation time of all lab experiments is extremely important for a successful teaching plan.</p> <p>Hence on completion of this course a B.Tech. Student upon graduating as Electrical Engineer would have a basic knowledge of designing analog and digital circuits.</p>			
COURSE OBJECTIVES			
To enrich the students' knowledge on practical circuit design using analog and digital ICs.			
COURSE OUTCOMES (CO)			
Course Outcomes	Aligned Programme Outcomes (PO)		
<p>On completion of the course the students will be able to</p> <ol style="list-style-type: none"> 1. Understand the non-ideal behaviour of Op-amp. 2. Analyze and prepare the technical report on the experiments carried out. 3. Design application-oriented circuits using Op-amp and 555 timer ICs. 4. Create and demonstrate live project using ICs. 	<p>PO₁, PO₂, PO₃ PO₁, PO₂, PO₃, PO₁₁ PO₁, PO₂, PO₃, PO₈ PO₁, PO₂, PO₃, PO₈ – PO₁₄</p>		

COURSE TEACHING AND LEARNING ACTIVITIES			
S. No.	Week	Topic	Mode of Delivery
1.	II week of July (10 th) 2 hr	Introduction to the course	Lecture <i>Chalk and talk using board</i>
2.	II week of July (12 th) 2 hr	Introduction to Op-amp circuits and familiarization of ICs (for 1 st batch)	Lecture <i>Chalk and talk using board</i>
3.	III week of July (17 th) 2 hrs	Introduction to Op-amp circuits and familiarization of ICs (for 2 nd batch)	Lecture <i>Chalk and talk using board</i>
4.	III week of July (19 th) 3 hrs	Experiment 1: Op-amp characteristics (for 1 st batch)	Practical Experimentation
5.	IV week of July (24 th) 3 hrs	Experiment 1: Op-amp characteristics (for 2 nd batch)	Practical Experimentation
6.	IV week of July (26 th) 3 hrs	Experiment 2: Inverting and Non inverting Amplifier (for 1 st batch)	Practical Experimentation
7.	V week of July (31 st) 3 hrs	Experiment 2: Inverting and Non inverting Amplifier (for 2 nd batch)	Practical Experimentation
8.	I week of August (2 nd) 3 hrs	Experiment 3: Differentiator and Integrator (for 1 st batch)	Practical Experimentation
9.	I week of August (7 th) 3 hrs	Experiment 3: Differentiator and Integrator (for 2 nd batch)	Practical Experimentation

10.	II week of August (9 th) 3 hrs	Experiment 4: Precision Rectifiers (for 1 st batch)	Practical Experimentation
11.	II week of August (14 th) 3 hrs	Experiment 4: Precision Rectifiers (for 2 nd batch)	Practical Experimentation
12.	III week of August (16 th -21 st) 3 hrs	Repeat Lab	Practical Experimentation
13.	IV week of August (23 rd) 3 hr	Experiment 5: Schmitt Trigger (for 1 st batch)	Practical Experimentation
14.	IV week of August (28 th) 3 hrs	Experiment 5: Schmitt Trigger (for 2 nd batch)	Practical Experimentation
15.	V week of August (30 th) 3 hrs	Experiment 6: Low pass and High pass filters(for 1 st batch)	Practical Experimentation
16.	I week of September (4 th) 3 hrs	Experiment 6: Low pass and High pass filters(for 2 nd batch)	Practical Experimentation
17.	I week of September (6 th) 3 hrs	Experiment 7: Counters (for 1 st batch)	Practical Experimentation
18.	II week of September (11 th) 3 hrs	Experiment 7: Counters (for 2 nd batch)	Practical Experimentation
19.	II week of September (13 th) 3 hrs	Experiment 8: Analog to Digital Conversion (for 1 st batch)	Practical Experimentation
20.	III week of September (18 th) 3 hrs	Experiment 8: Analog to Digital Conversion (for 2 nd batch)	Practical Experimentation
21.	III week of September (20 th) 3 hrs	Experiment 9: Digital to Analog Conversion(for 1 st batch)	Practical Experimentation

22.	IV week of September (25 th) 3 hrs	Experiment 9: Digital to Analog Conversion (for 2 nd batch)	Practical Experimentation
23.	IV week of September (27 th) 3 hrs	Experiment 10: Timing circuits using Timer IC 555 (for 1 st batch)	Practical Experimentation
24.	I week of October (2 nd) 3 hrs	Experiment 10: Timing circuits using Timer IC 555(for 2 nd batch)	Practical Experimentation
25.	I week of October (4 th to 9 th)	Repeat Lab	Practical Experimentation
26.	October (11 th to 30 th)	Assessment 2	Practical Experimentation
27.	I week of November (1 st)	Assessment 3	Written Test
28.	II week of November (6 th – 9 th) 3 hrs	Assessment 4	End semester Lab practical exam

COURSE ASSESSMENT METHODS

S. No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	Experimentation, Calculations, Viva, Graph and Results	During regular Lab sessions	During regular Lab sessions	40%
2.	Mini Project	October (11 th to 30 th)	During Lab sessions	20%
3.	Comprehensive written test	I week of November (1 st)	1 hr	10%
4.	End Semester Lab Exam	I week of November (6 th – 9 th)	3 hr	30%

ESSENTIAL READINGS : Textbooks, reference books Website addresses, journals, etc

1. D Roy Choudhary, 'Linear Integrated Circuits', 2nd Edition
2. Morris Mano, 'Digital Design', 4th Edition
3. Ramakanth Gayakwad, 'Operational Amplifiers and Linear Integrated Circuits', 4th Edition
4. George Clayton, Steve Winder, 'Operational Amplifiers', 5th Edition

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

1. Students' feedback through class committee meetings
2. Anonymous feedback from students using questionnaire
3. Feedback from students on Course Outcomes at the end of the semester

COURSE POLICY (Including plagiarism, academic honesty, attendance, etc.)


1. Minimum marks for passing this course and grading pattern will adhere to the regulations of the institute.
2. Every student should maintain 75% attendance, If not they have to redo the course.
3. Students who have missed the regular lab classes due to genuine/emergency reasons should get the prior permission for attending compensation lab class.
4. All the students are expected to be genuine during the course work. Taking information by copying another student's paper or using study material of any form during any assessments is considered dishonest.

5. Any evidence of such academic dishonesty will result in loss of marks in that assessment. Additionally names of such students will be reported to class committee chairperson and HOD for necessary actions. .

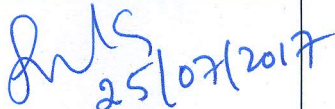
ADDITIONAL COURSE INFORMATION

1. The Course Coordinator is available for consultation during the time intimated to the students then and there.
2. All correspondence will be sent to the webmail id of the students alone. Hence all students are advised to check their webmail ids regularly.

FOR SENATE'S CONSIDERATION


[MIDHUN E K, TP/EEE]
Course Faculty


[Dr. Sishaj P Simon]
CC-Chairperson


HoD/Dept. of EEE
25/07/2017