

**DEPARTMENT OF ELETRONICS AND COMMUNICATION ENGINEERING**  
**NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

COURSE PLAN – PART I			
<b>Name of the Programme and specialization</b>	B.Tech (ECE)		
<b>Course Title</b>	ANALOG INTEGRATED CIRCUITS LAB (V <sup>th</sup> semester)		
<b>Course Code</b>	ECLR14	<b>No. of Credits</b>	2
<b>Course Code of Pre-requisite subject(s)</b>	-		
<b>Session</b>	July 2019	<b>Section (if, applicable)</b>	B
<b>Name of Faculty</b>	Mrs. P. Muthu Krishnammal	<b>Department</b>	ECE
<b>Email</b>	muthup@nitt.edu	<b>Telephone No.</b>	9884588247
<b>Course Coordinator(s) (if, applicable)</b>	-		
<b>E-mail</b>	-	<b>Telephone No.</b>	-
<b>Course Type</b>	<input checked="" type="checkbox"/> Core course <input type="checkbox"/> Elective course		
<b><u>Syllabus Approved in BOS</u></b>			
1.Study the characteristics of negative feedback amplifier 2.Design of an instrumentation amplifier 3.Study the characteristics of regenerative feedback system-Schmitt trigger 4.Study the characteristics of integrator circuit 5.Design of a second order Butterworth band-pass filter for the given higher and lower cut-off frequencies 6.Design of a high-Q Band pass self-tuned filter for a given center frequency 7.Design of a function generator-Square, Triangular 8.Design of a Voltage Controlled Oscillator 9.Design of a Phase Locked Loop(PLL) (Mini project)			
<b>COURSE OBJECTIVES</b>			
To measure the frequency response characteristics of Operational Amplifier. Analyze and design various applications of Operational Amplifiers. Design and construct waveform generation circuits Design Analog Circuits using 555 timer			
<b>COURSE OUTCOMES (CO)</b>			



Course Outcomes		Aligned Programme Outcomes (PO)	
1. Demonstrate theoretical device/circuit operation in properly constructed analog circuits.		PO1, PO2, PO4, PO6, PO10	
2. Able to correctly operate standard electronic test equipment digital multi-meters, power supplies to analyze, test, and implement digital circuits.		PO1, PO4, PO2, PO6, PO10	
3. Able to correctly analyze a circuit and compare its theoretical performance to actual performance.		PO6, PO2, PO4, PO10, PO1	
4. Able to apply troubleshooting techniques to test digital circuits.		PO1, PO10, PO4, PO6, PO2	
5. Able to map the Circuits implemented to that of real time application		PO5, PO6, PO10	
<b>COURSE PLAN – PART II</b>			
<b>COURSE OVERVIEW</b>			
<p>In Analog integrated circuit laboratory, students can understand the characteristics of Operational amplifier. The purpose of the course is to design the linear and non linear applications of an Op-Amp. To compare the working of multi vibrators using special application IC 555 and general purpose Op-Amp. Students can gain knowledge on working principle and the function of application specific ICs such as Voltage regulators, PLL and its application in communication.</p>			
<b>COURSE TEACHING AND LEARNING ACTIVITIES</b>			
S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	I WEEK	Inverting, Non Inverting and unity gain Amplifiers, and their time domain and frequency domain responses	Lab
2	II WEEK	Study the characteristics of integrator and differentiator circuit, , and their time domain and frequency domain responses	Lab
3	III Week	a. Design of an instrumentation amplifier b. Design of Precision Rectifiers	Lab
4	IV WEEK	a. Universal active Filter b. Quadrature oscillator	Lab



5	V WEEK	Applications of Analog multipliers	Lab
6	VI WEEK	Study the characteristics of Schmitt trigger and its applications such as Monostable and Astable multivibrators	Lab
7	VII WEEK	VCO as FM Generator	Lab
8	VIII WEEK	Design of a Phase Locked Loop(PLL)	Lab
9	IX WEEK	IC555 timer applications	Lab
10	X WEEK	Weinbridge and RC Phase Shift and Gyrator Oscillators	Lab

**COURSE ASSESSMENT METHODS (shall range from 4 to 6)**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1.	Record work	To be submitted every next week after completion of experiment		15
2.	Viva Exam	One week prior to end semester	1 hour	25
3.	Team Project	Two weeks prior to end semester		30
4.	End semester evaluation		90 mins	30

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

1. S.Franco, *Design with Operational Amplifiers and Analog Integrated Circuits (3/e)* TMH, 2003.
2. Sedra and Smith, *Microelectronics Circuits, Oxford Univ. Press, 2004*
3. Coughlin, Driscoll, *OP-AMPS and Linear Integrated Circuits, Prentice Hall, 2001.*

**COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)**

1. The students through class representative may give their feedback at any time which will be duly addressed.
2. Feedback from the students through MIS and class committee meetings

**COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)**

**MODE OF CORRESPONDENCE (email/ phone etc)**

All the students are advised to come to the lab classes regularly. All the correspondence (schedule of classes/ course material/ any other information regarding this course) will be intimated in the lab sessions only.

**Compensation Assessment Policy**

- **Not Applicable**

**ATTENDANCE POLICY** (A uniform attendance policy as specified below shall be followed)

- Attendance will be taken by the faculty. 100 % is a mandatory. However, the relaxation upto 20% will be given for leave on medical, and other essential requirements followed in the institute. Every student should maintain minimum 80% physical attendance in these contact hours along with assessment criteria to attend the end semester examination.
- Any student who fails to maintain 80% and misses any lab experiment needs to appear for the compensation classes with regular evaluation process. Students attendance is compulsory for Viva Exam and end semester.
- Students not having 80% minimum attendance with compensation at the end of the semester will have to REDO the course.

**ACADEMIC DISHONESTY & PLAGIARISM**

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.

**ADDITIONAL INFORMATION**



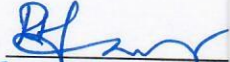
Queries may also be emailed to the Course faculty directly at [muthup@nitt.edu](mailto:muthup@nitt.edu).

**FOR APPROVAL**



Course Faculty \_\_\_\_\_

CC-Chairperson



HOD



(Dr. R. K. Jayachitra)

[Ms. P. MUTHU

KRISHNAMMAL]