

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

COURSE PLAN – PART I			
<b>Course Title</b>	ANALOG IC DESIGN LABORATORY		
<b>Course Code</b>	EC658	<b>No. of Credits</b>	2
<b>Course Code of Pre-requisite subject(s)</b>	EC651		
<b>Session</b>	Jan-2022	<b>Section (if, applicable)</b>	-
<b>Name of Faculty</b>	Dr. Archana S	<b>Department</b>	Electronics and communication engineering
<b>Email</b>	sarchana@nitt.edu	<b>Telephone No.</b>	9447449202
<b>Name of Course Coordinator(s) (if, applicable)</b>	-		
<b>E-mail</b>	-	<b>Telephone No.</b>	
<b>Course Type</b>	<input checked="" type="checkbox"/> <b>Lab course</b> <input type="checkbox"/> <b>Elective course</b>		
<b>Syllabus (approved in BoS)</b>			
<p><b>List of Experiments</b></p> <ol style="list-style-type: none"> <li>1. Characteristics of NMOS and PMOS Transistor</li> <li>2. Design of Common Source Amplifier with different Loads</li> <li>3. Design of Common Gate Amplifier</li> <li>4. Design of Common Drain Amplifier</li> <li>5. Design of Single stage Cascode Amplifiers</li> <li>6. Design of Current Mirrors</li> <li>7. Design of Differential Amplifiers with Different Loads</li> <li>8. Design of Two stage Opamp</li> <li>9. Design of Telescopic Cascode Opamp</li> <li>10. Design of Folded Cascode Opamp</li> </ol>			
<b>COURSE OBJECTIVES</b>			
<ol style="list-style-type: none"> <li>1. To understand the characteristics of MOS based analog VLSI circuits</li> <li>2. To draw the equivalent circuits of MOS based Analog VLSI and analyse their performance</li> <li>3. To design Analog VLSI circuits for given specification</li> <li>4. To analyse frequency response of different configurations of an amplifier</li> <li>5. To understand the feedback topologies involved in the amplifier design</li> <li>6. To appreciate the design features of the differential amplifier.</li> </ol>			
<b>COURSE OUTCOMES (CO)</b>			
<b>Course Outcomes</b>			<b>Aligned Programme Outcomes (PO)</b>
1. Introduce industry standard Analog IC design EDA tool			PO1,PO2,PO3

2. Practical learning and understanding of Analog amplifiers, current mirrors etc.	PO1,PO2,PO3,PO4
3. Solve analog design problems by changing the design parameter of the circuit with the help of Cadence Virtuoso.	PO4, PO5,PO6,PO7
4. Understand the working of circuits and enhance the analog design skills.	PO5,PO6,PO7, PO11
5. Learn the art of analog layout in IC design.	PO5,PO6,PO7, PO11

### COURSE PLAN – PART II

#### COURSE OVERVIEW

- To develop the ability to design and analyse MOS based Analog VLSI circuits, to draw the equivalent circuits and analyze their performance.
- To develop skills to design analog VLSI circuits for a given specification

#### COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week 1	Characteristics of NMOS and PMOS Transistor	Lab Exercise
2	Week 2	Design of Common Source Amplifier with different Loads	Lab Exercise
3	Week 3	Design of Common Gate Amplifier	Lab Exercise
4	Week 4	Design of Common Drain Amplifier	Lab Exercise
5	Week 5	Design of Single stage Cascode Amplifiers	Lab Exercise
6	Week 6	Design of Current Mirrors	Lab Exercise
7	Week 7	Design of Differential Amplifiers with Different Loads	Lab Exercise
8	Week 8	Design of Two stage Opamp	Lab Exercise
9	Week 9	Design of Telescopic Cascode Opamp	Lab Exercise
10	Week 10	Design of Folded Cascode Opamp	Lab Exercise

<b>COURSE ASSESSMENT METHODS (shall range from 4 to 6)</b>				
<b>S.No.</b>	<b>Mode of Assessment</b>	<b>Week/Date</b>	<b>Duration</b>	<b>% Weightage</b>
1	Record work	One experiment to be completed every week. The prepared record for each experiment to be submitted every week through online mode before the start of the next experiment.		30 marks
2	Assessment-1 (Lab Exercise)	2 <sup>nd</sup> Week of April	1 hour	20 marks
3	Viva-Voce (Descriptive)	3 <sup>rd</sup> Week April	1 hour	20 marks
4	Final Assessment	As per Academic Calender	2 hour	30 marks
<b>COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)</b>				
<ol style="list-style-type: none"> <li>1. Feedback from the students during class committee meeting.</li> <li>2. Queries through questionnaire.</li> </ol>				
<b>COURSE POLICY (preferred mode of correspondence with students, policy on attendance, compensation assessment, academic honesty and plagiarism etc.)</b>				
<b><u>MODE OF CORRESPONDENCE (email/ phone etc)</u></b>				
<ol style="list-style-type: none"> <li>1. All the students are advised to check their NITT WEBMAIL/group mail/suggested by the course faculty, class representative regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be done through them only.</li> <li>2. Queries (if required) to the course teacher shall only be emailed to the email id specified by the teacher.</li> </ol>				
<b><u>ATTENDANCE</u></b>				
<ol style="list-style-type: none"> <li>1. Attendance will be taken by the faculty in all the contact hours. Every student should try to be present in the class during these contact hours.</li> </ol>				
<b><u>COURSE ASSESSMENT:</u></b>				
<ol style="list-style-type: none"> <li>1. Attending all the assessments are mandatory for every student.</li> <li>2. No compensation assessment provided for Assessment 4 (Final Assessment).</li> <li>3. Finally, every student is expected to score minimum marks as per the regulations of the institute out of the total assessments 1, 2, 3 and 4. Otherwise student would be declared fail and 'F' grade will be awarded. Further he can take up only FORMATIVE ASSESSMENT.</li> </ol>				
<b><u>ACADEMIC HONESTY &amp; PLAGIARISM</u></b>				
<ol style="list-style-type: none"> <li>1. All the students are expected to be genuine during the course work. Taking of information by means of copying simulations, assignments, looking or attempting to look at another student's paper or bringing and using study material in any form for copying during any assessments is considered dishonest.</li> </ol>				

2. Tendering of information such as giving one's program, simulation work, assignments to another student to use or copy is also considered dishonest.
3. Preventing or hampering other students from pursuing their academic activities is also considered as academic dishonesty.
4. Any evidence of such academic dishonesty will result in the loss of marks on that assessment. Additionally, the names of those students so penalized will be reported to the class committee chairperson and HoD of the concerned department.
5. Students who honestly producing ORIGINAL and OUTSTANDING WORK will be REWARDED.

**ADDITIONAL INFORMATION**

Queries and feedback may also be emailed to the Course Faculty at [sarchana@nitt.edu](mailto:sarchana@nitt.edu)

**FOR APPROVAL**

Course Faculty  CC-Chairperson  HOD   
(Dr.V.Sudha)