NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF ECE

COURSE PLAN – PART I			
Name of the program and specialization	**B.Tech. Electronics and Communication Engineering**		
Course Title	**Electronic Circuits**		
Course Code	**ECPC17**	**No. of Credits**	03
Course Code of Pre-requisite subject(s)	**ECPC13**		
Session	**January, 2022**	**Semester/Section (if, applicable)**	**IV – Sec B**
Name of Faculty	**Dr. P. Maheswaran**	**Department**	**ECE**
Official Email	**mahes@nitt.edu**	**Telephone No.**	**9884111807**
Name of Course Coordinator(s) (if, applicable)			
Official E-mail		**Telephone No.**	
Course Type (please tick appropriately)	☑ **Core course**	☐ **Elective course**	

Syllabus (approved in BoS)

Load line, operating point, biasing methods for BJT and MOSFET. Low and high frequency models of BJT and MOSFET, Small signal Analysis of CE, CS, CD and Cascade amplifier

MOSFET amplifiers:
Current mirrors: Basic current mirror, Cascade current mirror,
Single-ended amplifiers: CS amplifier – with resistive load, diode connected load, current source load, triode load, source degeneration. CG and CD amplifiers, Cascade amplifier

Frequency response of amplifiers, Differential Amplifiers, CMRR, Differential amplifiers with active load, two stage amplifiers

Feedback concept, Properties, Feedback amplifiers, Stability analysis, Condition for oscillation, Sinusoidal oscillators.

Power amplifiers- class A, class B, class AB, Biasing circuits, class C and class D

Reference:

Text Books:

1. A.S.Sedra & K.C.Smith, “Microelectronic Circuits (5/e)”, Oxford, 2004.
2. D.L.Schilling & C.Belove, ”Electronic Circuits: Discrete and Integrated”, (3/e), McGraw Hill, 1989
3. Other relevant materials.

Reference Books:

1. Behzad Razavi, “Design of Analog CMOS Integrated Circuits”, (2/e), McGraw Hill, 2017.
2. J.Millman & Arvin Grabel, “Microelectronics”, McGraw Hill, 2007.
3. K.V.Ramanan, “Functional Electronics”, Tata McGraw Hill, 1984.

COURSE OBJECTIVES

To make the students understand the fundamentals of electronic circuits.

MAPPING OF COs with POs

Course Outcomes	**Programme Outcomes (PO) (**Enter Numbers only**)**
Illustrate about rectifiers, transistor and FET amplifiers and its biasing. Also compare the performances of its low frequency models.	1, 2, 3, 4, 6, 7
Discuss about the frequency response of MOSFET and BJT amplifiers.	1, 2, 3, 4, 6, 7
Illustrate about MOS and BJT differential amplifiers and its characteristics.	2, 5, 6, 8, 10
Discuss about the feedback concepts and construct feedback amplifiers and oscillators. Also summarizes its performance parameters.	2, 5, 6, 8, 10
Explain about power amplifiers and its types and also analyze its characteristics.	1, 2, 3, 6, 8, 10

COURSE PLAN – PART II

COURSE OVERVIEW

To make the student understand the fundamentals of electronics circuits.

COURSE TEACHING AND LEARNING ACTIVITIES (Add more rows)

S.No.	**Week/Contact Hours**	**Topic**	**Mode of Delivery**
1	**1st Week 2 contact hours**	Load line, operating point, Biasing methods for BJT	**PPT/Digital Writing pad/chalk-and-talk**
2	**2nd week 3 contact hours**	Biasing methods for BJT, and MOSFET	**PPT/Digital Writing pad/chalk-and-talk**

3	**3rd week 2 contact hours**	Low and high frequency models of BJT, and MOSFET	**PPT/Digital Writing pad/chalk-and-talk**
4	**4th week 3 contact hours**	Small signal Analysis of CE, CS, and Cascade amplifier, MOSFET amplifiers: Current mirrors: Basic current mirror	**PPT/Digital Writing pad/chalk-and-talk**
5	**5th week 2 contact hours**	Cascade current mirror, Single-ended amplifiers: CS amplifier – with resistive load, diode connected load	**PPT/Digital Writing pad/chalk-and-talk**
6	**6th week 3 contact hours**	Current source load, Triode load, Source degeneration	**PPT/Digital Writing pad/chalk-and-talk**
7	**7th week 3 contact hours**	CG and CD amplifiers, Cascade amplifier	**PPT/Digital Writing pad/chalk-and-talk**
		Assessment – 1 (Descriptive-written/Objective/both) – Institute Procedure	
8	**8th week 3 contact hours**	Frequency response of amplifiers, Differential Amplifiers	**PPT/Digital Writing pad/chalk-and-talk**
9	**9th week 1 contact hours**	Common mode rejection ratio	**PPT/Digital Writing pad/chalk-and-talk**
10	**10th week 3 contact hours**	Differential amplifiers with active load, two stage amplifiers	**PPT/Digital Writing pad/chalk-and-talk**
11	**11th week 3 contact hours**	Feedback concept, Properties, Feedback amplifiers	**PPT/Digital Writing pad/chalk-and-talk**
12	**12th week 2 contact hours**	Stability analysis, Condition for oscillation	**PPT/Digital Writing pad/chalk-and-talk**
13	**13th week 3 contact hours**	Sinusoidal oscillators	**PPT/Digital Writing pad/chalk-and-talk**
		Assessment – 2 (Descriptive-written/Objective/both) – Institute Procedure	

14	**14th week 3 contact hours**	Power amplifiers- class A, class B, class AB, Biasing circuits	**PPT/Digital Writing pad/chalk-and-talk**
15	**15th week 3 contact hours**	Class C and Class D amplifiers	**PPT/Digital Writing pad/chalk-and-talk**
16	**End Semester Assessment (Descriptive-written/Objective/both) –Institute Procedure**		**Written/Objective/Both**
	C&T – Chalk and Talk, PPT – Power point		

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

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment – 1 (Descriptive-written/Objective/both) – Institute Procedure	7th week	60 mins	20%
2	Assessment – 2 (Descriptive-written/Objective/both) – Institute Procedure	13th week	60 mins	20%
3	Assessment – 3 (Mini project or Assignment or Viva or Quiz (Oral/written))	Will be announced in the class		5%
4	Assessment – 4 (Mini project or Assignment or Viva or Quiz (Oral/written))	Will be announced in the class		5%
CPA	Compensation Assessment*	15th week	60 mins	Refer course policy
5	Final Assessment* (Descriptive-written/Objective/both) – Institute Procedure	17th week	180 mins	50%

***mandatory; refer to guidelines on pages 4, 5, and 6**

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

Feedback from the students through MIS and class committee meetings.

COURSE POLICY (including compensation assessment to be specified**)**

MODE OF CORRESPONDENCE (email/phone etc)

All the students are advised to check their NITT WEBMAIL/MS Teams regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be intimated in Class/MS Teams only.

ASSESSMENT POLICY

1. Attending all the assessments is MANDATORY for every student.
2. If any student is not able to attend any of the Continuous Assessments due to genuine reason, student is permitted to attend the **compensation assessment*** (CPA) with Corresponding weightage. (This is not valid for students who have attendance lag also.)
3. Please refer institute B.Tech Regulations/guidelines for grading policy.

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

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

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.
- The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

Queries may also be emailed to the course faculty directly at mahes@nitt.edu.

FOR APPROVAL

Course Faculty_____ **CC- Chairperson**_____ **HOD** _____

Guidelines

a) The number of assessments for any theory course shall range from 4 to 6.

b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.

c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.

d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.

f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.

g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.