III year

DEPARTMENT OF ECE

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the Programme and specialization	B.Tech Electronics and Communication Engineering		
Course Title	ANALOG COMMUNICATION		
Course Code	ECPC21	No. of Credits	03
Course Code of Pre-requisite subject(s)	ECPC10 MAIR 45		
Session	July 2019	Section (if, applicable)	B
Name of Faculty	Dr. V. Sudha	Department	ECE
Email	vsudha@nitt.edu	Telephone No.	9443608785
Name of Course Coordinator(s) (if, applicable)			
E-mail		Telephone No.	
Course Type	√ Core course	☐ Elective course	

Syllabus (approved in BoS)

Basic blocks of Communication System. Amplitude (Linear) Modulation – AM, DSB-SC, SSB-SC and VSB-SC. Methods of generation and detection. FDM. Super Heterodyne Receivers.
Angle (Non-Linear) Modulation - Frequency and Phase modulation. Transmission Bandwidth of FM signals, Methods of generation and detection. FM Stereo Multiplexing.
Noise - Internal and External Noise, Noise Calculation, Noise Figure. Noise in linear and nonlinear AM receivers, Threshold effect.
Noise in FM receivers, Threshold effect, Capture effect, FM Threshold reduction, Pre-emphasis and De-emphasis.
Pulse Modulation techniques – Sampling Process, PAM, PWM and PPM concepts, Methods of generation and detection. TDM. Noise performance.

Text Books

1. S.Haykins, Communication Systems, Wiley, (4/e), Reprint 2009.
2. Kennedy, Davis, Electronic Communication Systems (4/e), McGraw Hill, Reprint 2008.

Reference Books

1. B.Carlson, Introduction to Communication Systems, McGraw-Hill, (4/e), 2009.
2. J.Smith, Modern Communication Circuits (2/e), McGraw Hill, 1997.
3. J.S.Beasley&G.M.Miler, Modern Electronic Communication (9/e), Prentice-Hall, 2008.

COURSE OBJECTIVES	
To develop a fundamental understanding on Communication Systems with emphasis on analog modulation techniques and noise performance.	
COURSE OUTCOMES (CO)	
Course Outcomes	**Aligned Programme Outcomes (PO)**
At the end of the course student will be able to	
1. Understand the basics of communication system and analog modulation techniques.	1,2,3,4,6
2. Apply the basic knowledge of signals and systems and understand the concept of Frequency modulation.	1,2,3,4,6
3. Apply the basic knowledge of electronic circuits and understand the effect of Noise in communication system and noise performance of AM system.	1,3,4,7
4. Understand the effect of noise performance of FM system.	1,3,4,7
5. Understand TDM and Pulse Modulation techniques.	1,2,4

COURSE PLAN – PART II			
COURSE OVERVIEW			
This course deals with the basics of communication systems and analog modulation techniques in detail. Students will get exposure about the practical circuits for AM and FM generation and its detection. Students can learn about the effect of noise in AM, FM receivers and various pulse modulation techniques.			
COURSE TEACHING AND LEARNING ACTIVITIES			
S.No.	**Week/ Contact Hours**	**Topic**	**Mode of Delivery**
1	Week 1 **(3 Contact Hours)**	Basic blocks of Communication System. Amplitude (Linear) Modulation.	C&T/ PPT
2	Week 2 **(3 Contact Hours)**	Principles of AM, DSB-SC, SSB-SC and VSB-SC. Power and Bandwidth calculations.	
3	Week 3 **(3 Contact Hours)**	Methods of generation and detection of AM, DSB-SC, SSB-SC and VSB-SC signals.	
4	Week 4 **(3 Contact Hours)**	FDM. Super Heterodyne Receivers. Introduction to Angle Modulation, Frequency modulation.	
	ASSESSMENT I - 20 Marks		Written
5	Week 5 **(3 Contact Hours)**	Phase modulation. FM Stereo Multiplexing. Introduction to Noise in Communication systems.	C&T/ PPT
6	Week 6 **(3 Contact Hours)**	Internal and External Noise. Noise Calculation, Noise Figure.	
7	Week 7 **(3 Contact Hours)**	Noise in linear and nonlinear AM receivers, Threshold effect.	C&T/ PPT

8	Week 8 **(3 Contact Hours)**	Noise in FM receivers, Threshold effect, Capture effect.	
	ASSESSMENT II - 20 Marks		Written
9	Week 9 **(3 Contact Hours)**	FM Threshold reduction, Pre-emphasis and De-emphasis	C&T/ PPT
10	Week 10 **(3 Contact Hours)**	Pulse Modulation techniques – Sampling Process.	
11	Week 11 **(3 Contact Hours)**	PAM, PWM and PPM concepts	
12	Week 12 **(3 Contact Hours)**	Methods of generation and detection	
	ASSESSMENT III - 10 Marks		Assignment Test / Quiz / Mini Project
13	Week 13 **(3 Contact Hours)**	TDM. Noise performance.	C&T/ PPT
14	Week 14 **(3 Contact Hours)**	**CPA - 20 Marks**	Written
15	Week 15 **(3 Contact Hours)**	**END ASSESSMENT – 50 Marks**	Written

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment I	4th Week	60 Minutes	20
2	Assessment II	8th Week	60 Minutes	20
3	Assessment III	12th Week		10
4	CPA (Compensation Assessment*)	14th Week	60 Minutes	20
5	Final Assessment *	15th Week	180 Minutes	50

***mandatory; refer to guidelines on page 4**

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

Feedback from the students during class committee meetings and MIS.

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 check their NITT WEBMAIL/group mail/ class representative regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be intimated in class only.

ASSESSMENT POLICY

1. Attending all the assessments are 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 20% weightage.
3. Please refer institute B.Tech Regulations/ guidelines for grading policy.

ATTENDANCE POLICY

- **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

Queries may also be emailed to the course teacher directly at vsudha@nitt.edu

FOR APPROVAL

Course Faculty _____ **CC-Chairperson** _____ **HOD** _____

(DR. V. SUDHA) (Dr R.K. Jeyachitra)