

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	Practical	Tutorial	Total
EXC 405	Fundamentals of Communication Engineering	04	--	--	04	--	--	04

Subject Code	Subject Name	Examination Scheme							
		Theory Marks				Term Work	Practical And Oral	Oral	Total
		Internal assessment			End Sem. Exam				
		Test 1	Test 2	Ave. Of Test 1 and Test 2					
EXC 405	Fundamentals of Communication Engineering	20	20	20	80	--	--	--	100

Prerequisite Topics: Basic Electronic Devices and Circuits and measurements

Course Objective:

1. To understand basics of wireless communication systems.
2. To understand modulation and demodulation techniques.
3. To understand working of transmitters and receivers
4. To understand the basic concept of Digital communication

Course Outcome:

1. Students will be able to understand the components of wireless communication systems
2. Students will be able to understand various modulation techniques and their applications
3. Students will be able to understand difference between analog and digital communication

Module No.	Unit No.	Topics	Hrs.
1.0		Elements of Communication System :	08
	1.1	Electromagnetic Waves Propagation: Maxwell's equations for static and time varying fields, wave equation for free space and dielectric mediums, propagation terms and definition, electromagnetic frequency spectrum,	
	1.2	Basic communication system: Block diagram representation	
	1.3	Concept of Modulation and Demodulation: Signal representation, noise in communication signals and channels, signal-to-noise ratio, noise factor and noise figure, equivalent noise temperature	
2.0		Amplitude Modulation	10
	2.1	Principles of DSB Full Carrier AM	
	2.2	Different types of AM : DSB-SC ,SSB-SC , VSB, ISB	
	2.3	Practical diode detector	
3.0		Angle modulation	10
	3.1	Principles of Frequency Modulation and Phase Modulation	
	3.2	FM Modulators: Narrow band FM and wide band FM, FM transmitter, noise triangle, Pre-emphasis and De-emphasis circuits	
	3.3	FM Detection: frequency discriminator and phase discriminator	
4.0		Radio Receivers	06
	4.1	Receiver Characteristics , TRF Receivers, and Super heterodyne, Receivers, Choice of IF, AGC, AFC in AM and FM receivers	
5.0		Analog Pulse Modulation	08
	5.1	Sampling: Theorem, aliasing error and sampling techniques	
	5.2	Demodulation and spectrum of PAM, PWM, PPM	
6.0		Digital Pulse Modulation(only concepts and no numerical problems)	10
	6.1	Comparison of digital signal transmission and analog signal transmission	
	6.2	Pulse- code modulation (PCM) : sampling ,quantizing ,encoding technique, PCM bandwidth	
	6.3	Concept of Delta modulation (DM) and Adaptive Delta Modulation(ADM)	
	6.4	Multiplexing: TDM, FDM- Principles & applications	
		Total	52

Recommended Books:

1. Wayne Tomasi "*Electronics communication systems*" Pearson education, Third edition, 2001.
2. Kennedy and Davis "*Electronics communication system* ",Tata McGraw Hill
3. R.P. Sing and S.D. Sapre, "*Communication systems Analog and Digital*", Tata McGraw Hill
4. Taub and Schilling "*Principles of communication systems*", Tata McGraw Hill
5. Roy Blake, "*Electronics communication system*", Thomson learning, second edition.
6. B.P. Lathi "*Modern Digital and analog Communication system*" Third edition, OXFORD
7. Robert J. Schoenbeck "*Electronics communications modulation and transmission*".
8. Lean W couch "*Digital and Analog communication system*", Pearson education, Sixth edition.
9. Roddy Coolen, "*Electronic Communications*" PHI

Term Work:

At least 10 experiments based on the entire syllabus should be set to have well predefined inference and conclusion. The experiments should be students' centric and attempt should be made to make experiments more meaningful, interesting and innovative. Term work assessment must be based on the **overall performance** of the student with **every experiment graded from time to time**. The grades should be converted into marks as per the **Credit and Grading System** manual and should be **added and averaged**. The grading and term work assessment should be done based on this scheme.

Internal Assessment (IA):

Two tests must be conducted which should cover at least 80% of syllabus. The average marks of both the test will be considered as final IA marks

End Semester Examination:

1. Question paper will comprise of 6 questions, each carrying 20 marks.
2. The students need to solve total 4 questions.
- 3: Question No.1 will be compulsory and based on entire syllabus.
- 4: Remaining question (Q.2 to Q.6) will be selected from all the modules.
- 5: Weightage of marks will be as per Blueprint.