

EC 421 Statistical Communication Theory**COURSE INFORMATION**

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Laboratory	
BA323 EC32 2	4	7	2	2	2	3

COURSE AIM

To get the student familiar with practical analog and digital communication systems and their performance in the presence of noise.

COURSE WEEKLY CONTENTS

- Week Number 1:* Review of probabilities, R.V., characteristics function, joint R.V., correlation, independence.
- Week Number 2:* Transformation of random variables + review of random processes
- Week Number 3:* Random processes: Autocorrelation, PSD, Stationarity, Ergodicity
- Week Number 4:* AWGN channels and band-pass noise- I-Q representation of Bandpass noise
- Week Number 5:* Performance of Linear Modulation: Coherent detectors, AM noncoherent detection in the presence of noise.
- Week Number 6:* Performance of Exponential Modulation in the presence of Noise: PM detection in the presence of noise FM performance in the presence of noise.
- Week Number 7:* Optimum pre-emphasis and de-emphasis systems. Discrimination between NBFM and WBFM on noise performance basis.
- Week Number 8:* Performance of Analog Pulse Modulation in the presence of Noise: PAM
- Week Number 9:* Noise performance of PWM and PPM. Bandwidth noise reduction.
- Week Number 10:* Quantization error. SQNR, Performance of PCM in the presence of Noise- Probability of Error.
- Week Number 11:* Matched filter Theory- White noise- Colored noise. Correlation receivers.
- Week Number 12:* Performance of PCM with Matched Filter receivers.
- Week Number 13:* Power Spectral Density and spectral efficiencies of PCM waveforms.
- Week Number 14:* Intersymbol Interference (ISI): Concept, and pulse shaping techniques: Nyquist pulse, raised cosine pulse, Duobinary signaling
- Week Number 15:* Performance of FDM and TDM in noise.
- Week Number 16:* Final Exam.

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	20 Midterm	←	10	MARKS		→	30
			To be freely distributed among possible assessments				
8 to 12	←		20	MARKS		→	20
13 to 15	←		10	MARKS		→	10
16 or 17	40 Final						40
Total	Exams	Assign.	Quizzes	Reports	Present.	Lab.	100

REFERENCES

- | | |
|-----------------|---|
| Textbook | • Peyton Z. Peebles, Jr "Probability, Random Variables, and Random Signals" |
| Other | • Couch "Digital and analog communication systems" |