



Course: M.Sc. (Electronic Science)	Name of Faculty: Dr. Deepti Das Krishna
Topic: 16-305-0303 COMMUNICATION SYSTEMS	Semester: FIRST
Lecture Hall: MSc 3 rd (Electronic Science)	Timings: as per CBCS, Slot A

<i>Week and date</i>	<i>Lecture topics</i>	<i>Assignments</i>	<i>Remarks</i>
Week 1 (10 th July 19)	Revision of Communication basics (Fourier Analysis and Analog Communications)		
Week 2 (15 th July 19)	Module 2: Sampling Theorem, PAM, PWM, PPM – Generation and Demodulation		
Week 3 (22 nd July 19)	Module 2: Spectra of Pulse modulated Signals, SNR Calculations	Assignment-1	
Week 4 (29 th July 19)	Module 2: Digital Pulse Modulation: Quantization, PC Module 2: Spectra of Pulse modulated Signals , DPCM, DM, ADM		
Week 5 (5 th Aug 19)	Introduction to Digital Modulation Schemes: ASK, PSK, FSK, Digital M-ary Modulation Schemes		
Week 6 (12 th Aug 19)	Module 1: Review of Probability and Random Variables	Assignment-1 submission	
Week 7 (19 th Aug 19)	Module 1: Central limit Theorem, Chi square, Rayleigh and Rician distributions		
Week 8 (26 th Aug 19)	First Internals		
Week 9 (2 nd Sep 19)	Module 1: Correlation, Covariance matrix- Stationary processes, wide sense stationary processes, ergodic process, cross correlation and autocorrelation functions- Gaussian process	Assignment-2	
Week 10 (16 th Sep 19)	Module 3: Signal Space Concepts-Geometric structure, Vector representation, distance, norm, inner product, orthogonality		
Onam Vacation			
Week 11 (23 rd Sep 19)	Module 3: ISI, Pulse shaping, Eye diagram, Equalizer, Scrambling, descrambling	Assignment-2 submission	
Week 12 (30 th Sep 19)	Module 4: Gaussian random process, Optimum waveform receiver in additive white Gaussian noise (AWGN) channels - Cross correlation receiver, Matched filter receiver and error probabilities.		
Week 13 (14 th Oct 19)	Second Internals		
Week 14 (21 st Oct 19)	Module 4: Signals with random phase in AWGN Channels- Optimum receiver for Binary Signals- Optimum receiver for M-ary orthogonal signals- Probability of error for envelope detection of M- ary Orthogonal signals		
Week 15 (28 th Oct 19)	Module 5: Coherent and non-coherent detection, Power spectra of digitally modulated signals, Differential Modulation Schemes		
Week 16 (4 th Nov 19)	Module 5: Performance comparison of digital modulation schemes		
Week 17 (6 th Nov 19)	Publication of Sessional		
Week 18 (7 th Nov 19)	REVISION		



Course: M.Tech. (Electronics & Communication Engineering)	Name of Faculty: Dr. Deepti Das Krishna
Topic: 18-437-0109 MICROWAVE DEVICES AND CIRCUITS	Semester: FIRST
Lecture Hall: MTech 1st (Electronics & Communication)	Timings: as per CBCS, Slot D

<i>Week and date</i>	<i>Lecture topics</i>	<i>Assignments</i>	<i>Remarks</i>
Week 1 (10 th July 19)	Module 1: Review of Transmission lines, Smith Chart		
Week 2 (15 th July 19)	Module 1: Microstrip Line, Strip line, Coplanar line. Basic theory and design of planar filters.		
Week 3 (22 nd July 19)	Module 1: Basic theory and design of planar filters.	Assignment-1	
Week 4 (29 th July 19)	Module 2: BJT, IMPATT devices, Transferred Electron devices		
Week 5 (5 th Aug 19)	Module 2: Gunn diodes, MESFET, HEMT, control devices, Varactors, PIN diodes		
Week 6 (12 th Aug 19)	Module 2: Switches, phase shifters, modulators and attenuators, Detectors.	Assignment-1 submission	
Week 7 (19 th Aug 19)	Module 3: S Parameters of a network		
Week 8 (26 th Aug 19)	First Internals		
Week 9 (2 nd Sep 19)	Module 3: Stability consideration in active networks, Stability circles, stability criteria	Assignment-2	
Week 10 (16 th Sep 19)	Module 3: Matching networks, power gain concepts, unilateral transistor, gain circles, noise figure circles, bilateral design		
Onam Vacation			
Week 11 (23 rd Sep 19)	Module 4: Oscillation conditions, Two port and one port oscillators, Oscillator and stability conditions, tunable oscillators	Assignment-2 submission	
Week 12 (30 th Sep 19)	Module 4: Mixers, mixer types, up convertors, down convertors		
Week 13 (14 th Oct 19)	Second Internals		
Week 14 (21 st Oct 19)	Module 4: Harmonic mixers, circuits design, conversion loss and noise figure, cascaded circuits, Inter modulation		
Week 15 (28 th Oct 19)	Module 5: Monolithic and hybrid MICs, Substrate and conductor materials		
Week 16 (4 th Nov 19)	Module 5: IC design, reproducibility and reliability issues, chip manufacturing aspects, RF MEMS		
Week 17 (6 th Nov 19)	Publication of Sessional		
Week 18 (7 th Nov 19)	REVISION		

Course: M.Tech. (Electronics & Communication Engineering)	Name of Faculty: Dr. Deepti Das Krishna
Topic: 18-437-0110 MICROWAVE LABORATORY	Semester: FIRST
Lecture Hall: Microwave Lab	Timings: as per CBCS

Set of experiments

1. The Slotted Line (waveguide hardware, measurement of SWR, λ_g , impedance)
2. The Vector Network Analyzer (one- and two-port network analysis, frequency response)
3. The Gunn Diode and Klystron source (the spectrum analyzer, power meter, V/I curve)
4. Impedance Matching and Tuning (stub tuner, $\lambda/4$ transformer, network analyzer)
5. Cavity Resonators (resonant frequency, Q, frequency counter)
6. Directional Couplers, Circulators, Waveguide Tees, Isolators, Attenuators (insertion loss, coupling, directivity)
7. Computer Aided Design and Testing of
 - Planar Transmission Lines
 - Planar Filters
 - Microwave Transistors (Biasing and Layout)
 - Matching Network (Design and Layout)
 - Amplifier Linear Performance
 - Amplifier Nonlinear Performance and Intermodulation
 - Noise Performance of Amplifiers