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| **Name of the Faculty : SURESH JINDAL** |
| **Discipline : Electronics and Communication Engg.** |
| **Semester : IIIrd** |
| **Subject : PRINCIPLES OF COMMUNICATION ENGINEERING** |
| **Lesson Plan Duration : Sept-2022 - Jan-2023** |
| **Work Load (Lecture/ Practical) per week (in hours):** 03 hours (Lecture) 03 hours (practical) |

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| **week** | **Theory** | | **practical** | |
|  | **Lecture day** | **Topic(including assignment/test)** | **Practical day** | **topic** |
| 1st | 1st | Introduction | 1st | Introduction |
|  | 2nd | Need for modulation, frequency translation and demodulation in communication systems |
|  | 3rd | Basic scheme of a modern communication system. |
| 2nd | 4th | Amplitude modulation, Derivation of expression for an amplitude modulated wave. | 3rd | 1.a) To observe an AM wave on CRO produced by a standard signal generator using internal and  external modulation |
|  | 5th | Carrier and side band components, Modulation index. Spectrum and BW of AM Wave. |
|  | 6th | Relative power distribution in carrier and side  bands. |
| 3rd | 7th | Elementary idea of DSB-SC, SSB-SC, ISB and VSB modulations, their comparison, and areas of applications | 5th | b) To measure the modulation index of the wave obtained in above practical |
|  | 8th | Expression for frequency modulated wave and its frequency spectrum (without Proof and analysis of Bassel function) |
|  | 9th | Modulation index, maximum frequency deviation and deviation ratio, BW of FM  signals, Carson’s rule, Effect of noise on FM carrier. Noise triangle, Role of limiter, Need for pre-emphasis and de-emphasis,  capture effect. |
| 4th | 10th | Comparison of FM and AM in communication systems | 7th | a) To obtain an AM wave from a square law modulator circuit and observe waveforms |
|  | 11th | Phase modulation, Derivation of expression for phase modulated wave |
|  | 12th | modulation index, comparison with  frequency modulation |
| 5th | 13st | Principles of AM Modulators | 9th | b) To measure the modulation index of the obtained wave form. |
|  | 14st | Circuit Diagram and working operation of:  Collector and Base Modulator |
|  | 15rd | Circuit Diagram and working operation of:  Square Low Modulator, Circuit Diagram and working operation Balanced Modulator |
| 6th | 16th | 1stsessional | 11th | 1stsessional |
|  | 17th | 12th |
|  | 18th | 13th |
| 7th | 19th | Principles of FM Modulators, Working principles and applications of reactance modulator | 16th | . To obtain an FM wave and measure the frequency deviation for different modulating signals. |
|  | 20nd | Working principles and applications of varactor diode modulator |
|  | 21st | Working principles and applications of VCO, Working principles and applications of  Armstrong phase modulator, Stabilization of carrier using AFC (Block diagram approach). |
| 8th | 22th | Demodulation of AM Waves | 18th | To obtain modulating signal from an AM detector circuit and observe the pattern for different RC time  constants and obtain its optimum value for least distortion. |
|  | 23th | Principles of demodulation of AM waves, diode detector circuit |
|  | 24th | Concept of Clipping and  Formula for RC time constant for minimum distortion (no derivation) |
| 9th | 25th | Demodulation of FM Waves, Basic principles of FM detection using slope detector | 20th | obtain modulating signal froTm FM detector. |
|  | 26th | Principle and working of the  Foster-Seeley discriminator |
|  | 27th | Principle of working of the Ratio detector, Block diagram of Phase locked Loop(PLL) FM demodulators (No Derivation) |
| 10th | 28th | 2ndsessional test | 22nd | To observe the sampled signal and compare it with the analog input signal. Note the effect of varying the  sampling pulse width and frequency on the sampled output. |
|  | 29th |
|  | 30th |
| 11th | 31st | Pulse Modulation | 24th | To observe and note the pulse amplitude modulated signal (PAM) and compare them with the  corresponding analog input signal |
|  | 32nd | Statement of sampling theorem and elementary idea of sampling frequency for pulse modulation | 25th |
|  | 33rd | Revision | 26th |
| 12th | 34th | Basic concepts of frequency division multiplexing(FDM) | 29th | Viva Voice |
|  | 35th | Pulse Amplitude Modulation(PAM), , |
|  | 36th | Pulse Position Modulation(PPM), Pulse Width Modulation(PWM). |
| 13th | 37th | Revision | 31st | To observe PPM and PWM signal and compare it with the analog input signal |
|  | 38th |
|  | 39th |
| 14th | 40th | 3rdsessional | 33rd | 3rdsessional |
|  | 41th |
|  | 42th |
| 15th | 43th | Revision | 35th | Revision |
|  | 44th | 36th |
|  | 45th | 37th |