**ICS 3103 Communication Systems**

Analysis and synthesis of waveforms. Modulation. Communication channels (media), their natures and characteristics. Measures of information, Gausian sources and channels, etc. Performance criteria and limits of communication systems,. Bandwidth utilization efficiency, bandwidth expansion factor, signal-to-noise power ration, error probabilities. Shannon techniques, eg envelope, angle, composite, PCD, channel coding for error control and security, study of common as well as emerging communication technologies and systems, eg copper wire, coaxial cable, fiber optics, satellite, terrestrial microwave, broadcast and mobile radio, PSTN, cellular radio.

Principles of multiplexing and public switched telephone networks: wireless communication systems. Cellular communication system, protocols and standards.