COURSE TITLE	**TE142442: Multicarrier Communication Systems** Credits: 2 ELECTIVE COURSE
LEARNING OBJECTIVES	To study multicarrier techniques for high capacity modern digital communication systems.
COMPETENCY	The students are expected to understand: • Statistical characterisation of wideband communication channel: wireless & wired • Multicarrier communication techniques and their performance • Multiuser detection techniques in CDMA and MC-CDMA and their performance
SUBJECTS	• Frequency selective channel • Principles of multicarrier communication system • Frequency selective channel capacity • Concept of multicarrier system with waterfilling • Channel orthogonalization • OFDM concepts • Vector coding concepts • OFDM performance in AWGN channel • Performance of OFDM in frequency selective channel • Channel dispersion effects on OFDM • Channel estimation techniques for OFDM • Interchannel interference (ICI) and cancellation • Frequency and time error effects on OFDM • Frequency and time synchronisation techniques • MC-CDMA concepts • MC-CDMA performance • Introduction to MIMO-OFDM • xDSL technology • 3G cellular tecnology (MC-CDMA) • WiFi, WiMAX and DVB-T/H
MAIN REFERENCES	• LieLiang Yang, Multicarrier Communications, Wiley, 2009.
OPTIONAL REFERENCES	• K. Fazel & S. Kaiser, Multi-Carrier and Spread Spectrum Systems: From OFDM and MC-CDMA to LTE and WiMAX, 2nd ed., Wiley, 2008. • Ahmad R.S. Bahai, Burton R. Saltzberg, Mustafa Ergen, Multi-Carrier Digital Communications: Theory and Applications of OFDM, 2nd ed., Springer, 2004. • IEEE Trans. on Communications • IEEE Trans. on Wireless Communications • IEEE Trans. on Signal Processing • IEEE J. on Selected Areas in Communications
PREREQUISITE	-