

COURSE TITLE	TE142440: Distributed Detection and Estimation Credits: 2 ELECTIVE COURSE
LEARNING OBJECTIVES	To study distributed and estimation techniques, with special interest for wireless sensor network.
COMPETENCY	The students will understand: <ul style="list-style-type: none"> • Signal detection and parameter estimation techniques in stochastic framework • Formulation of detection and estimation problems in distributed setting, as well as proposed techniques in the literature
SUBJECTS	<ul style="list-style-type: none"> • Introduction: problems in data collection and extraction in sensor network • Detection theory: binary and M-ary hypothesis testing • Parameter estimation theory: maximum likelihood, Bayesian, BLUE, MVUE, Cramér-Rao lower bound • Detection of signal in additive noise • Distributed detection in sensor network • Distributed estimation in sensor network • Distributed adaptive filter in sensor network • Distributed channel decoding in sensor network
MAIN REFERENCES	<ul style="list-style-type: none"> • Bernard C. Levy, <u>Principles of Signal Detection and Parameter Estimation</u>, Springer, 2008. • Ananthram Swami, Qing Zhao, Yao-Win Hong, Lang Tong, <u>Wireless Sensor Networks: Signal Processing and Communications Perspectives</u>, Wiley, 2007.
OPTIONAL REFERENCES	<ul style="list-style-type: none"> • S. Sitharama Iyengar & Richard R. Brooks, eds., <u>Distributed Sensor Networks</u>, Chapman Hall/CRC Press, 2005. • IEEE Trans. on Signal Processing • IEEE Journal on Selected Areas in Comm.
PREREQUISITE	-