COURSE TITLE	**TE142444: Game Theory and Wireless Networks** Credits: 2 ELECTIVE COURSE
LEARNING OBJECTIVES	To study principles of game theory and its applications in wireless networks, especially for efficiency and fairness in resources allocation, as well as performance improvement.
COMPETENCY	The students are expected to able to: • Understand principles of game theory, as well as important parameters: Nash equilibrium, efisiensi Pareto efficiency. • Formulate problems in wireless networks within the game theoretic framework. • Analyze solutions for problems in wireless networks based on key parameters and performance.
SUBJECTS	• Introduction to game theory: games in strategic form and Nash equilibrium • Existence and properties of Nash equlibrium, Pareto efficiency, correlated equilibrium, extensives form games • Repeated games, Bayesian games and Bayesian equilibrium, Potential games, Learning in games: fictitious play and regret minimization • Applications for wireless networks: routing, dynamic channel allocation, power control, link adaptation,selfish behavior in MAC layer, general game theoretic framework for cognitive radio networks and game theoretic solutions for cooperation in ad hoc networks. Secure protocols for behavior enforcement.
MAIN REFERENCES	• Allen B. MacKenzie & Luiz A. DaSilva, Game Theory for Wireless Engineers, Morgan Claypool, 2006. • Levente Buttyan & Jean-Pierre Hubaux, Security and Cooperation in Wireless Networks, Cambridge University Press, 2007.
OPTIONAL REFERENCES	• Martin J. Osborne, An Introduction to Game Theory, Oxford University Press, 2003. • Lars Berlemann & Stefan Mangold, Cognitive Radio and Dynamic Spectrum Access, Wiley, 2009. • IEEE Trans. on Wireless Communications • IEEE Trans. on Communications • IEEE J. on Selected Areas in Communications
PREREQUISITE	-