

COURSE: EECS 430. TITLE: Radiowave Propagation and Link Design. PREREQUISITES: EECS 330 & Senior or Graduate		ELECTIVE.
TEXTBOOK: L. Boithias, <i>Radiowave Propagation</i> and course pack.		
CATALOG DESCRIPTION: Fundamentals of electromagnetic wave propagation in the ionosphere, the troposphere, and near the Earth. Student teams will develop practical radio link designs and demonstrate critical technologies. Simple antennas, noise, diffraction, refraction, absorption, multi-path interference, and scattering are studied.		
COURSE OBJECTIVES: 1. To give students hands-on experience in radiowave propagation, antennae, system noise and hardware in applications such as: wireless telecommunication, radar, and radio navigation; 2. To give students practical experience in wireless radiowave link design using each of the following: (a) a conceptual system design project; and (b) hands-on proof-of-concept demonstration projects.		TOPICS COVERED: 1. Radiation, dipoles, Poynting thm. 2. Antennae, Friis transmission eqn. 3. Receiver and antenna noise 4. Signal-to-noise, free space link 5. GPS, radar link, receiving system 6. Detained antenna characteristics 7. Propagation in dispersive media 8. Propagation in troposphere and in ionosphere; satellite links 9. Propagation over land, water, city
COURSE OUTCOMES [Program Outcomes Addressed] 1. Ability to design a complete radiowave link at the system level, given link specifications; [3,5,11] 2. Ability to configure, measure and conduct design tradeoffs for different antenna systems; [2,3,5,11] 3. Ability to include noise & propagation effects on ground, in atmosphere, & in ionosphere; [1,11,13] 4. Ability to configure & operate a simple operational radio link, as part of a design team; [2,3,4,5,11] 5. Ability to perform: team organization & dynamics; product management & development. [4,7]		ASSESSMENT (Course outcomes) 1. Weekly problem sets [1,2] 2. In-class closed-book exams [1,2] 3. Design oral & written report[1-5]
PROGRAM OUTCOMES ADDRESSED: 1,2,3,4,5,7,11 PROFESSIONAL COMPONENT ADDRESSED: 13 PREPARED BY: Andrew E. Yagle on Nov. 25, 2004	CLASS/LABORATORY SCHEDULE: LECTURES: 2 per week @ 90 minutes. RECITATION: 1 per week @ 2 hours.	

COURSE DESCRIPTION: University of Michigan, College of Engineering, ELECTRICAL ENGINEERING PROGRAM