

ECE 5010: Wireless Propagation and Remote Sensing

Course Description

Practical methods for predicting tropospheric, groundwave, and ionospheric propagation, including refraction, reflection, and extinction effects. Study of remote sensing systems and their applications.

Prior Course Number: 713

Transcript Abbreviation: Prop & Remote Sens

Grading Plan: Letter Grade

Course Deliveries: Classroom

Course Levels: Undergrad, Graduate

Student Ranks: Junior, Senior, Masters, Doctoral

Course Offerings: Autumn

Flex Scheduled Course: Never

Course Frequency: Every Year

Course Length: 14 Week

Credits: 3.0

Repeatable: No

Time Distribution: 3.0 hr Lec

Expected out-of-class hours per week: 6.0

Graded Component: Lecture

Credit by Examination: No

Admission Condition: No

Off Campus: Never

Campus Locations: Columbus

Prerequisites and Co-requisites: Prereq: 3010 (312), or Grad standing in Engineering, Biological Sciences, or Math and Physical Sciences.

Exclusions: Not open to students with credit for 713.

Cross-Listings:

Course Rationale: Existing course.

The course is required for this unit's degrees, majors, and/or minors: No

The course is a GEC: No

The course is an elective (for this or other units) or is a service course for other units: Yes

Subject/CIP Code: 14.1001

Subsidy Level: Doctoral Course

Programs

Abbreviation	Description
CpE	Computer Engineering
EE	Electrical Engineering

Course Goals

Master analytical and empirical methods for predicting the propagation of electromagnetic waves over a wide range of frequencies
Be competent in basic remote sensing concepts

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Review of electrodynamics	8.0							
Direct transmission and satellite communications	3.0							
Propagation through reflection and refraction	4.0							
Propagation over irregular terrain	6.0							
Groundwave propagation	3.0							
Ionospheric effects on propagation	7.0							
Remote sensing systems and applications	8.0							

Representative Assignments

Homeworks/problem sets/quizzes
Midterm exam(s)
Final exam

Grades

Aspect	Percent
Midterm exam	40%
Final exam	40%
Homework	20%

Representative Textbooks and Other Course Materials

Title	Author
<i>Radiowave Propagation: Physics and Applications</i>	Levis, Johnson, and Teixeira

ABET-EAC Criterion 3 Outcomes

Course Contribution	College Outcome
***	a An ability to apply knowledge of mathematics, science, and engineering.
	b An ability to design and conduct experiments, as well as to analyze and interpret data.
	c An ability to design a system, component, or process to meet desired needs.
	d An ability to function on multi-disciplinary teams.
	e An ability to identify, formulate, and solve engineering problems.
	f An understanding of professional and ethical responsibility.
	g An ability to communicate effectively.
	h The broad education necessary to understand the impact of engineering solutions in a global and societal context.
	i A recognition of the need for, and an ability to engage in life-long learning.
	j A knowledge of contemporary issues.
	k An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

CpE ABET-EAC Criterion 9 Program Criteria Outcomes

Course Contribution		Program Outcome
***	1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
	2	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
	3	an ability to communicate effectively with a range of audiences
	4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
	5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
	6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
	7	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

EE ABET-EAC Criterion 9 Program Criteria Outcomes

Course Contribution		Program Outcome
**	1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
	2	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
	3	an ability to communicate effectively with a range of audiences
	4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
	5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
	6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
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Additional Notes or Comments

Changed "radar" to remote sensing in title, abbreviation, topics and goals.

Delete course goal about remote sensing. 6/17/16 BLA

Adjust number of lecture hours, grading, and ABET outcomes 6/14/ 2019- waiting for clarification from Joel on lecture hours

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