

# 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	6.0							
Direct transmission and satellite communications	3.0							
Propagation through reflection and refraction	4.0							
Propagation over irregular terrain	3.0							
Groundwave propagation	3.0							
Ionospheric effects on propagation	6.0							
Remote sensing systems and applications	15.0							

## Representative Assignments

Homeworks/problem sets created by instructor
Midterm exam
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.

## 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

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