

## **ENPH 350 Communications Theory**

**Department: Engineering and Physics**

**Credit Hours: 3**

**Required or Elective (circle one)**

### **Current Catalog Description:**

Introduction to the frequency and time domain; modulation; random signal theory; network analysis using nondeterministic signals; basic information theory; noise. Prerequisites: ENPH 314 or concurrent enrollment, ENPH 225. Course fee \$15.

### **Course Schedule:**

3 lecture hr/wk, 0 lab hr/wk

### **Coordinator:**

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### **Prerequisites by Topic:**

ENPH 314 or concurrent enrollment  
ENPH 225

### **Course Learning Goals and Program Outcomes Map:**

The Program Outcomes for Engineering Physics are:

- A. an ability to apply knowledge of math, engineering & science
- B. an ability to design and conduct experiments, as well as to analyze and interpret data
- C. an ability to design system, component or process to meet needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- 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, economic, environmental, and societal context
- I. a recognition of need for, and ability to engage in life-long learning
- J. a knowledge of contemporary issues
- K. an ability to use techniques, skills, and modern engineering tools necessary for engineering practice.
- L. a depth and breadth of knowledge in engineering and physics necessary to work in a multidisciplinary environment

<b>Course Goals</b>	<b>Program Outcome(s):</b>
Upon completion of this course with a C or better, students will	
1. Understand the role of communications theory in engineering and science as well as its application.	F,H,I,J,L
2. Understand and be able to obtain the spectral information of signal used in communication systems	A,E,K
3. Explain and determine the following communications theory terminology: Amplitude modulation, angle modulation, communication channel, power spectrum, Fourier transform, Hilbert transform, sampling theorem, intersymbol interference, deterministic functions, nondeterministic functions.	A,E
4. Be able to produce spectral lines for an angle modulated signal	A,E
5. Be able to translate between the frequency and time domains, autocorrelation function and the power spectral density.	A,E,K
6. Understand the effects of noise on communication systems.	A,B,C,D,E,G,K
7. Be able to use the Nyquist sampling theorem for complete signal recovery and Nyquist criterion for zero intersymbol interference	A,E
8. Understand and be able to apply the subject of probability and random variables to communications theory problems	A,B,E,K
9. Understand the principles of data transmission in noise.	A,E
10. Understand and be able to apply the Nyquist Criterion for zero intersymbol interference	A,E

**Academic Honesty:**

Cheating, plagiarism (submitting another person's materials or ideas as one's own), or doing work for another person who will receive academic credit are all-impermissible. This includes the use of unauthorized books, notebooks, or other sources in order to secure or give help during an examination, the unauthorized copying of examinations, assignments, reports, or term papers, or the presentation of unacknowledged material as if it were the student's own work. Disciplinary action may be taken beyond the academic discipline administered by the faculty member who teaches the course in which the cheating took place.

**Students with Disabilities Policy:**

It is the policy of Tarleton State University to comply with the Americans with Disabilities Act (ADA) and other federal, state, and local laws relative to the provision of disability services. Students with disabilities attending Tarleton State University may contact the Office of Disability Services at (254) 968-9478 to request appropriate accommodation. Furthermore, formal accommodation requests cannot be made until the student has been officially admitted to Tarleton State University.

**Contribution of Course to Meeting the Professional Requirement:**

Engineering Topics: 100%

**Status of Continuous Improvement Review of this Course:**

**Prepared by:** Falih Ahmad

**Date:** Saturday, March 21, 2009

**Reviewed by:**

**Date:**