

## ENPH 345 Electronics

**Department: Mathematics, Physics and Engineering**

**Credit Hours: 4**

### **Current Catalog Description:**

Introduction to electronic systems; linear circuits; operational amplifiers and applications; diodes, field effect transistors, bipolar transistors; amplifiers and nonlinear circuits.

### **Course Schedule:**

3 lecture hr per wk, 3 lab hr per week

### **Coordinator:**

Denise Martinez

### **Prerequisites by Topic:**

ENPH 225 Electrical Circuit Theory (co requisite)

### **Course Learning Goals and Program Outcome 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 and be able to explain the characteristics and operation of diodes, Bipolar Junction Transistors, Field-Effect Transistors and operational amplifiers.	A,L
2. Be able to solve problems involving linear and nonlinear circuits	A,E,L
3. Be able to model the performance of circuits containing electronic devices using tools such as Multisim and LabView	A,B,E,K
4. Be able to construct circuits containing electronic devices on a breadboard and measure the performance of the circuit using hardware and software tools.	A,B,E,K,L
5. Be able to recognize, analyze, and explain the differences between the theoretical behavior of circuit and actual circuit performance	A,B,E,K
6. Be able to design circuits containing these electronic devices to perform a specified function.	A,B,C,D,E,G,K
7. Be able to analyze and design practical electronics applications	A,C,E,H,K,L

including voltage regulators, rectifiers, wave-shapers, power supplies, integrators, differentiators and active filters	
8. Be able to communicate orally and in writing concerning their solutions to problems, measurements, analyses and circuit designs	A,E,G,K,L
9. Recognize and be able to explain the importance of these electronic devices in today's society.	A,E,G,H,J

**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:** *Denise Martinez*

**Date:** *May 18, 2005*

**Reviewed by:** *Mircea Agapie*

**Date:** *May 19, 2005*

**Review Notes:**

- to emphasize the outcomes c, e, h, k and l, maybe we should specify somewhere in the goals (maybe goal 6, or a new goal) some of the practical circuits in which electronic parts are being used, e.g. voltage regulators, rectifiers, wave-shapers, power sources, integrators & differentiators, active filters. Maybe it could be formulated "have a working knowledge of ..." - ma
  - ✓ - added goal, dmm