

## EE 442L

1. **Course Number & Name:** EE 442L, Analog and Digital Communications Lab
2. **Course Credit and Contact hours:** 1 Unit, 3 hours Lab
3. **Course Coordinator:** Dr. Donald Estreich
4. **Textbook:** *Experiments and Activities Manual for Principles of Electronic Communication Systems*, Louis E. Frenzel Jr. , 4<sup>th</sup> edition, McGraw Hill, 2015. ISBN 978-1259166448
5. **Supplemental Materials:** Lab instructions, slides, and handouts.
6. **Specific Course Information:**
  - a. **Description:** Laboratory work covers various analog and digital communication elements, and modulation, and demodulation techniques.
  - b. **Prerequisites:** EE 230 and EE 400, or with consent of instructor
  - c. **Co-Requisite:** EE 442 Lecture, or with consent of instructor
  - d. **Status:**  Required for EE program,  Elective,  Selected Elective
7. **Specific Goals for the Course:**
  - a. **Specific outcomes of instruction:** Upon successful completion of this course the students will gain:
    - i. Ability to understand the difference between analog and digital systems, their respective advantages and disadvantages.
    - ii. Ability to apply signal and system analytical tools in both the time and frequency domains.
    - iii. Ability to develop critical thinking skills by analyzing commutation systems.
    - iv. Ability to study signal and linear time invariant system properties.
    - v. Ability to study, design, and build amplitude modulation systems examining tradeoffs in different communication systems.
    - vi. Ability to study, design, and build angle modulation systems examining tradeoffs in different communication systems.
    - vii. Ability to perform experiments in converting analog information into digital data via sampling, quantization, and coding. Ability to collaborate together by working in teams of 3 to 4 students.

**b. This course supports the following ABET Student Outcomes:**

- i. SO-6: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.*

**8. Brief List of Topics to be Covered:**

- a. General micro-controllers architecture
- b. Signal analysis
- c. Periodic signal spectra
- d. Linear time invariant systems and filters
- e. Introduction to modulation
- f. Amplitude modulation
- g. Frequency modulation
- h. Sampling
- i. Pulse code modulation