**Course Objectives**

1. Understanding of the principles of linear circuit analysis as demonstrated in quizzes, learning exercises and tests.

2. Ability to apply those principles to the design and analysis of practical circuits as demonstrated in laboratory experiments and student design projects.

3. Ability to use software tools and lab instruments to design, simulate, build, test and document first-order simple circuits using discrete passive components and operational amplifiers.

Course Outcomes (Codes in parentheses refer to Student learning outcomes)

**Skills**:

Upon successful completion of the course, the student will be able to:

1. Use power supplies, signal generators, and oscilloscopes for testing circuits (k)

2. Determine voltages and currents in a circuit using nodal and mesh analysis (a, e)

3. Use Norton and Thevenin theorems to convert between equivalent circuits (e)

4. Learn and apply complex numbers (a)

 5. Use phasor representation to determine steady state frequency analysis of circuits (a, e)

6. Create and interpret Bode plots for two port networks (a)

7. Determine the transient response of first order and second order linear circuits (a)

8. Use op amps to build active filters, summers, inverting and non-inverting amplifiers (e)

9. Design with op amps circuits using manufacturer’s data sheets and other technical data. (e)

10. Develop a working knowledge of engineering statistics and regression analysis (LSBF)

**Knowledge**:

Upon successful completion of the course, the student will be able to explain:

1. How energy conservation and charge conservation apply to circuit analysis (a)

2. The practical limitations of operational amplifiers (a)

3. Phasor representation of sinusoidal signals and introductory Fourier analysis of periodic signals (a)

4. The concepts of impedance and admittance (a)

5. How real passive components differ from their linear ideal models

**Attitude**:

At all times the student will exhibit:

1. Concern for the safety of themselves and others

2. Efficient use of time and resources

3. Courtesy and collegiality to classmates, faculty, and staff

4. Personal integrity and honesty

5. Desire for clear communication

6. Desire to achieve objectives