Course Description
EE 1305-Introduction to Electrical Engineering

2000-02 Catalog Data: An exposure to the mathematical and physical concepts that are essential to the field of electrical engineering. Includes applications at an elementary level in the areas of networks, energy conversion, and digital logic. Prerequisite: MATH 1410 or MATH 1508, with a grade of "C" or better. EE 1305 must be taken prior to registration for EE 2351.

Prerequisites by Topic:
1. Algebra
2. Trigonometry
3. Complex Numbers
4. Vectors


Course Outcomes: Students completing EE 1305 will:
1. Be able to apply the fundamental principles (Ohm’s Law and Kirchoff’s Laws) to understand the operation of electrical circuits (C).
2. Be able to combine circuit elements using the rules governing series and parallel connections (C).
3. Be able to apply node analysis for the solution of DC circuits (C).
4. Be able to apply loop analysis for the solution of DC circuits (C).
5. Be able to apply the principles of voltage and current division to analyze DC circuits (C).
6. Be able to determine the Thevenin and Norton equivalent circuits for simple DC circuits (I).
7. Be able to understand the basic voltage/current and energy relationships for capacitors and inductors (C).
8. Be able to analyze AC networks using phasor analysis and impedance concepts (C).
9. Be able to understand the input/output relationships for basic logic gates and flip-flops (C).
10. Be able to apply the fundamentals of Boolean Algebra to analyze the operation of simple digital networks (C).
11. Gain an appreciation for engineering ethics and professionalism (I).

Topics Covered:
1. Introduction and Overview (1.5 hrs.)
3. Introduction to DC Circuit Analysis: Ohm’s Law, Series/Parallel Connections, Node Analysis, Loop Analysis, Voltage and Current Dividers (9 hrs.)
4. Techniques of DC Analysis: Thevenin/Norton Equivalent Circuits, Power Calculations (4.5 hrs.)
5. Inductance and Capacitance: Voltage/Current Relationships, Energy Storage (3 hrs.)
7. Phasor Analysis of RLC Circuits: Impedance, Frequency Response (3 hrs.)
9. Engineering Ethics and Professionalism: Departmental Orientation, Case Study on Engineering Ethics (3 hrs.)
10. Exams (4.5 hrs.)

Class Schedule: Three hours lecture per week.

Contribution to Professional Component:

EE 1305 is a required lower division course that introduces students to the basic laws that govern the operation of electrical circuits.

Relationship to Program Outcomes:

1. Apply mathematics, science and engineering principles.

Students use concepts from algebra, trigonometry, vector analysis, calculus and Boolean algebra in the analysis of electrical circuits. (Course Outcomes 1-10.)

3. Ability to design a system, component, or process to meet desired needs.

Students complete an assignment wherein they design a simple digital network. (Course Outcome 10.)

5. Ability to identify, formulate, and solve engineering problems.

Students hone these skills while working homework problems. (Course Outcomes 1-10.)
6. Understanding of professional and ethical responsibility.

Students complete a writing assignment based upon watching a case study videotape, "Academic Integrity: The Bridge to Professional Ethics." (Course Outcome: 11.)

Computer Usage: None

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