EEL4214 - Power Systems II
Three Credits, Two and a half hours, Engineering Topic.

Instructor: Dr. Arif Sarwat.

Textbook:

Specific Course Information:
The goal of this course is to teach students the basics of power systems operations, power flow and impact of economic decisions. The course teaches students techniques to model power system and conduct analysis over it. The course also helps students understand modern concepts being currently implemented over electric grids. It exposes students to smart grid and phasor measurement units. Students learn about modern tools and are exposed to decision-making.

Specific Goals for the Course
a. Specific outcomes of instruction
   Upon successful completion of this course, the student will:
   1. Discuss power system operations and security issues
   2. Modeling of power components for power flow
   3. Power Flow formulation and solution techniques
   4. Economic Operations and control of Power Systems
   5. Involve students in a practical power systems operations and security issues through the term project.
   6. Be able to analyze large volume of data for power flow in Smart grids.

b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.
   In this course the student will have to show
   (a) an ability to apply knowledge of mathematics, science, and engineering (X)
   (b) an ability to design and conduct experiments (simulations), as well as to analyze, interpret data (X)
   (c) an ability to design a system, component, or process to meet desired needs (X)
   (d) an ability to function in multi-disciplinary teams (N/A)
   (e) an ability to identify, formulate, and solve engineering problems (homework) (X)
(f) an understanding of professional and ethical responsibility (X)
(g) an ability to communicate effectively (through project reports) (X)
(h) the broad education necessary to understand the impact of engineering solutions in a global and societal context (X)
(i) a recognition of the need, and an ability to engage in life-long learning (X)
(j) a knowledge of contemporary issues (X)
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (N/A)
(l) a knowledge of probability and statistics (X)

**Brief list of the topics to be covered**

1. Circuit Variables
2. Circuit Elements
3. Simple Resistive Circuits
4. Techniques of Circuit Analysis
5. Inductance, Capacitance, and Mutual Inductance
6. Sinusoidal Steady-State Analysis
7. Sinusoidal Steady-State Power Calculations

**GRADING:**

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**Conversion of Numerical Grade to Letter Grade**

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**Note:**

- A: Outstanding
- B+: Above Average
- B: Average
- C+: Satisfactory
- C: Pass
- D+: Minimal Competence
- D: Minimal Competence
- F: Failed