PURDUE UNIVERSITY | Elmore Family School of Electrical and Computer Engineering

Engineering Faculty Document No. EFD 37-22
January 18, 2022

Memorandum

To: The College of Engineering Faculty

From: The Elmore Family School of Electrical and Computer Engineering

Re: new Electric Power and Energy Systems Concentration

The faculty of the Elmore Family School of Electrical and Computer Engineering has approved the following new concentration from the College of Engineering. This action is now submitted to the Engineering Faculty with a recommendation for approval.

Description: The Electric Power and Energy Systems Concentration is for BSEE students who plan to pursue careers in the power industry (e.g., electric utilities, smart grid software/hardware industry, grid operators, power equipment vendors, automotive, heavy equipment, aircraft, and marine industries). It focuses on areas of electric power and energy systems, and in particular elements of power engineering, power electronics and drives, and electric machinery.

Reasons: This fundamental knowledge is absolutely necessary for EE graduates that would like to pursue careers in the power industry (e.g., electric utilities, smart grid software/hardware industry, grid operators, power equipment vendors, automotive, heavy equipment, aircraft, and marine industries), since these areas have converged over the past few years with the integration of renewables in the grid and the proliferation of electric vehicles. We believe that the concentration would help attract even more students in the area, and would also be helpful in their careers after graduation.

Milind Kulkarni
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Concentration in Electric Power and Energy Systems for the Bachelor of Science in Electrical Engineering

Electric Power and Energy Systems

1. What is the topic focus of the concentration?

The topic focus of the concentration is the area of electric power and energy systems, and in particular elements of power engineering, power electronics and drives, and electric machinery.

2. Why might students want to take/benefit from this concentration?

This fundamental knowledge is absolutely necessary for EE graduates that would like to pursue careers in the power industry (e.g., electric utilities, smart grid software/hardware industry, grid operators, automotive, aircraft, navy, etc), since these areas have converged over the past few years with the integration of renewables in the grid and the proliferation of electric vehicles. We believe that the concentration would help attract even more students in the area, and would also be helpful in their careers after graduation.

3. What might the demand be from students?

The demand from the students would be to take 3 relevant courses at the 300/400/500 level, as described below.

Proposing [Sub]area

This is proposed by the core faculty of the power area:
Dionysios Aliprantis (area chair)
Steven Pekarek
Junjie Qin
Scott Sudhoff
Oleg Wasynczuk

Target Degree

It will apply to the BSEE degree. It will also apply to 4+1 BS/MS students.

Concentration Requirements

Electives: 9 credits

- ECE 31032 Power Systems Engineering (3 credits)
- ECE 32100 Electromechanical Motion Device (3 credits) or
  ECE 51012 Electromechanics (3 credits)
- ECE 42300 Electromechanical Motion Control (3 credits)
- ECE 43300 Power Electronics (3 credits)
- ECE 51018 Hybrid and Electric Vehicles (3 credits)
- ECE 51032 Computational Methods for Power Systems Analysis (3 credits)