

**THE UNIVERSITY SENATE OF MICHIGAN TECHNOLOGICAL UNIVERSITY**

**PROPOSAL 18-08**

**“CERTIFICATE IN ELECTRIC POWER ENGINEERING “**

Electrical and Computer Engineering Department

(Voting Units: Academic)

**Introduction**

This proposal recommends establishing an undergraduate certificate entitled “Certificate in Electric Power Engineering” through the Electrical and Computer Engineering Department. The Certificate is designed for engineers without a degree in Electrical Engineering. Students completing this Certificate will have established a set of core competencies in electric power engineering.

**I. Title of Certificate**

Certificate in Electric Power Engineering

**II. Catalog Description**

The Certificate in Electric Power Engineering program provides the student with the foundational tools and knowledge needed to understand and work with the electric power aspects of the electric utility industry. It is recommended that students have an educational background of integral calculus and a physics course covering electricity and magnetism. Students not presently enrolled at Michigan Tech should contact the department to determine the appropriate elective courses.

**III. Rationale**

The U.S. electric energy industry is facing a shortage of engineering talent. In discussing employment trends with several energy industry employers, it is apparent that a large proportion of their engineering staff is within 5-7 years of retirement along with a shortage of early to mid-career engineers. This workplace demographic is a result of the uncertainties that arose during the recent restructuring of the electric utility industry. During this period, utilities, uncertain of their future, cut back on the hiring of engineers. To correct this problem, employers have become more aggressive in hiring graduating engineers and have become interested in retraining existing engineering staff.

Due to a decline in the number of Electric Power programs throughout the country, many of the new engineers the utilities will hire will not have an electric power background. In addition, many of their existing engineering staff will not have an electric power background.

This Certificate program is designed, in consultation with employers, to address these educational needs. All of the lecture courses will be offered online to accommodate engineers’ work schedules. The lab will be offered on campus in intensive one week sessions outside of Fall and Spring semesters.

**IV. List of Courses**

**Required Courses (7 Credits)**

EE 4221 – Power System Analysis 1 – 3

EE 4222 – Power System Analysis 2 – 3

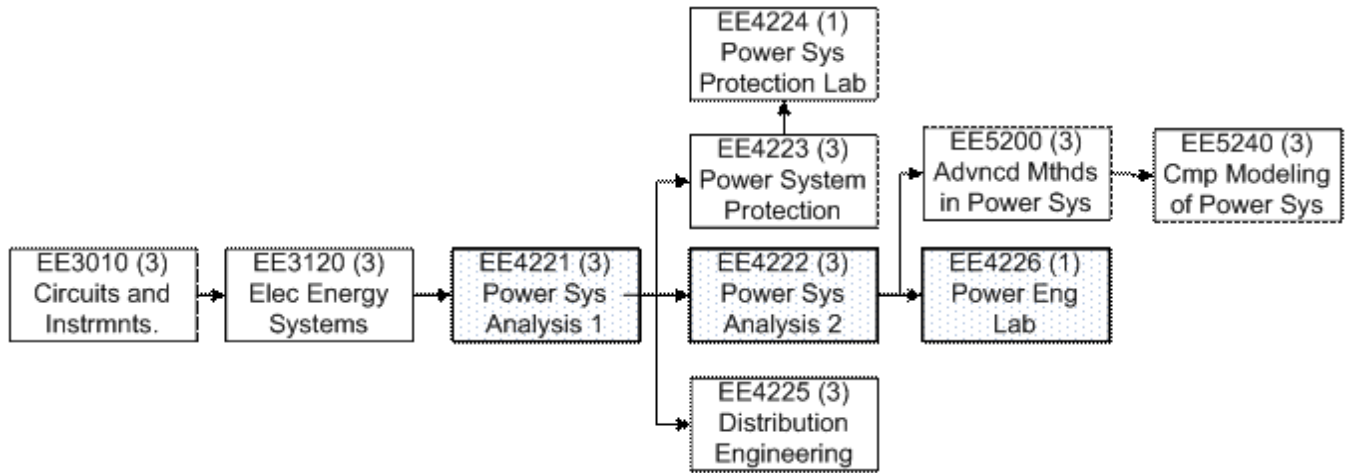
EE 4226 – Power Engineering Lab – 1

### Elective Courses (6 Credits)

- EE 3010 – Circuits and Instrumentation - 3
- EE 3120 – Electric Energy Systems – 3
- EE 4223 or EE 5223 - Power System Protection – 3
- EE 4224 or EE 5224 – Power System Protection Lab – 1
- EE 4225 or EE 5250 – Distribution Engineering – 3
- EE 5200 – Advanced Methods in Power Sys – 3
- EE 5240 – Computer Modeling of Power Systems – 3

Total Credits 13

### Curriculum Flowchart



### V. Estimated Cost

All the courses except EE 4226 are existing courses and are presently being taught on a regular basis. EE 4226 will be developed by the Electrical and Computer Engineering Department using internal resources.

All the existing lecture courses except EE 3120, EE 4221, and EE 4222 are already taught online. ETS has indicated that they can accommodate these additional online courses.

**Introduced to Senate: 27 February 2008**

**Adopted by Senate: 19 March 2008**

**Approved by Administration: 7 April 2008**