



# Advanced Topics in Power Systems

## ECE 7843

**Credit Hours:**

3.00 - 3.00

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**Course Levels:**

Graduate (5000-8000 level)

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**Course Components:**

Lecture

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**Course Description:**

Advanced topics of power system protection, beginning with equipment protection and evolving into system wide protection design and operation to accommodate smart-grid technologies.

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**Prerequisites and Co-requisites:**

Prereq: 5042 or 740.

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**Course Goals / Objectives:**

- Introduce electric power system protection concepts
  - Elaborate on specific protection criteria for individual components, i.e., for generators, for transformer, for lines, etc.
  - Present system-wide protection principles as applied to central station systems
  - Present protective schemes unique for smart-grid topologies from a system perspective
  - Present protective schemes unique for smart-grid topologies from a grid component perspective
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**Course Topics:**

- Review energy supply system structure and operation: current and smart-grid implementation and appropriate protection strategies
  - Protection concepts unique to various system components: generators, transformers, transmission lines, etc.
  - System-wide protection philosophies/principles for various modes of system operation, e.g., with and without islanding
  - Adaptive relaying applied to modern grid operation
  - Presentation and review of multi-week projects.
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**Designation:**

Elective