Fall 2017 Power and Energy Systems (PES) Course Schedule

1. PES 6310 - Power Electronics Converters and Control

Power Electronics and applications; Review of power devices including wide band gap devices. Harmonics and power factor in non-sinusoidal systems. AC-DC Phase Controlled Thyristor Converters. DC-DC converters: Buck, Boost, and Buck-Boost converters. Flyback, Cuk, and Full bridge converters. DC-AC Inverters: Square wave, Sinusoidal, Space Vector PWM, and current regulated inverters. Introduction to Active Rectifiers, Resonant Converters, and Multi-level converters.

- Mon 5:30 PM – 8:30 PM (Face-to-Face only)

2. PES 6330 - Power System Analysis


- Section 02: (Online)
- Section 03: Tues 5:30 PM – 8:30 PM (Face-to-Face)

3. PES 6332 - Smart Grid Systems

Basic of Smart Grid, Definition and Applications. Smart switches, Self-healing, Communication Technologies, Two-way Digital Communications Paradigm and Network Architectures, Wireless Standards (Protocols: Zigbee, WiFi, WiMax), Smart metering and Advanced Metering Infrastructure, Local Area Networks: Home network and HEN (home energy management), Wide Area Wireless

- Section 02: (Online)
- Section 03: Thurs 5:30 PM – 8:30 PM (Face-to-Face)

4. PES 6334 Power System Protection, Monitoring and Control
Protection Basics; Instrument Transformers; Grounding schemes, fault detection and identification; Distribution Protection, Instantaneous overcurrent protection, Time overcurrent protection, Bus protection, Differential Protection; Protection of Transformer, Generator, and Motors. Phase Distance Schemes, Ground Distance Scheme, Supervising element, and Fault Type Selection Logic; Communication Aided Distance Protection; Line Current Differential Protection; Phasor Measurement units; Synchrophasor Vector Processor; Wide area protection.

- Wed 5:30 PM – 8:30 PM (Face-to-Face only)