

Lehigh University
Electrical and Computer Engineering Department

Electrical Energy Systems

ECE 350-15, CRN#46183 undergraduates, **ECE 450-15, CRN#46182** graduates

Fall 2010

Syllabus:

Electric power generation through electromagnetic machines, solar energy, and by chemical means in primary and secondary batteries. Energy storage. Solar cell characteristics. Photovoltaic (PV) - motor systems, PV systems feeding the grid, stand alone PV systems with energy storage in secondary batteries. Battery characteristics. Stand alone photovoltaic/storage battery system. Electric power in dc and ac systems. phasor, average, reactive and apparent power in single and three phase systems. Power factor correction. Term paper. Prerequisite: ECE 81.

MWF 11.10-12, PL 322.

Term paper:

Due on Nov. 10 during classes

10-20 pages long

10 minute oral presentation

Important dates

Aug. 30, 2010 First day of class.

Oct.11-12, 2010 Pacing break.

Nov. 10, 2010 Project paper due during class.

Nov. 24-26, 2010 Thanksgiving break.

Dec. 10, 2010 Last day of class.

Aug, 30, 2010

Detailed design of a renewable energy system

a) Grid-tied photovoltaic system of your home

Determine loads, roof area available for panels, locations for inverter, disconnect switches

Selection and sizing of solar panels, inverter, disconnect switches, meters, wire runs and wire connections

Wiring diagrams

Compliance with local and national codes

Calculations and analysis

b) Stand-alone solar electric system

All of the above and the batteries