New Course Offered in Spring 2008
ECSE-4967/6962
EPOW-4960/6960

Renewable Energy and Sustainability

Course Description: There is an increasing worldwide demand for renewable energy sources in order to achieve sustainable electric power. Renewable energy systems are penetrating electric utility, transportation, telecommunications and other industries. In this course, the fundamentals of renewable energy and storage systems will be discussed. Our focus is on converting the energy from wind, solar, ocean, hydrogen, and biomass to usable electrical energy. Renewable energy sources can be combined as hybrid systems and improve energy security. Renewable energy systems can be modular, combined as microgrids or connected to a power grid. The energy conversion mechanism, the required building blocks including the electromechanical energy converters and power electronics converters for successful generation of useful electrical energy will be emphasized. The power electronics interface for integration of the generated power from renewable sources with each other and/or with existing power systems will be covered. Efficient ways to combine the energy obtained from different sources will be discussed. Control strategies for maximum power point tracking (MPPT), improvement of total harmonic distortion (THD) and issues related to intermittent nature of renewable energy sources will be discussed.

Class Schedule: Mondays and Thursdays 4:00-5:20 pm
Instructor: Leila Parsa, ECSE Dept, parsa@ecse.rpi.edu
Pre-requisites: ECSE 2050