

## **ENGR 3601: Fundamentals of Renewable Energy**

### **3 Credit Hours**

*Prerequisite: Engineering Standing Requirements*

This course reviews various renewable energy sources to meet the increasing global energy demand of the 21st century in a sustainable manner. The course introduces the fundamental energy conversion principles, energy economics, and the current status of renewable sources, such as Hydroelectric, Wind, Solar Thermal, Solar Photovoltaics, Ocean Waves, Tidal, Geothermal, and Biomass energy. The course also discusses the basic concepts of renewable energy integration to the grid and various energy storage technologies. The course integrates projects on solar thermal, wind and solar photovoltaic systems and concludes with a project where students effectively apply their knowledge to conceptualize and design an alternative energy harvesting device.

## **ENGR 3602: Energy Efficiency**

### **3 Credit Hours**

*Prerequisite: Engineering Standing Requirements*

This course presents a detailed overview of energy efficiency related topics in engineering integrated design with a focus on energy efficiency, energy efficiency base codes and standards, developing energy efficiency knowledge categories (Taxonomy), and developing performance based scoring systems. This course also presents a detail building and manufacturing plant energy modeling with software, presenting energy modeling, energy modeling under uncertainty (uncertainty analysis and sensitivity analysis), use of techniques such as decision making under uncertainty to help different managerial and design decisions for Engineers and Decision Makers.

## **ENGR 3603: Hydrokinetic Energy**

### **3 Credit Hours**

*Prerequisite: Engineering Standing Requirements*

The course introduces various forms of hydrokinetic energy and their potential for the generation of electrical energy. The course will discuss the conversion techniques of hydraulic energy into electrical energy and various hydraulic machines that are used for this conversion process. The course will also elaborate the significance and the impact of hydrokinetic energy on the environment.