

1. Course number and name

EE 492: Renewable Energy Sources

2. Credits and contact hours

3.0 (three lecture hours per week)

3. Instructor's or course coordinator's name

Ali Mehrizi-Sani

4. Text book, title, author, and year

Renewable and Efficient Power Systems. New York: McGraw-Hill, 2013 , ISBN 978-1-118-14062-8.

Other supplemental materials

Lectures will be recorded using WSU's Panopto system.

5. Specific course information

a. *Catalog description:*

Design of electrical generation plants using wind, solar and other renewable energy sources including technical, environmental and economic aspects.

b. *Prerequisites or co-requisites:* E E 361 with a C or better; certified major in Electrical Engineering, Computer Science, or Computer Engineering.

6. Specific goals for the course

At the end of this course, students must be able to:

- Calculate cost of electricity generation (1) (1a, 1b, 1c, 1d, 1e, 1f);
- Analyze a PV, wind, or fuel cell system (1, 2) (1a, 1b, 1c, 1d, 1e, 1f);
- Analyze and solve problems related to a renewable energy generation system (1, 2, 5) (1a, 1b, 1c);
- Compare different renewable energy generation technologies (1, 2) (6a, 6b, 6c, 6d);
- Build a renewables related prototype and present/defend the design; (1, 2, 3, 5, 6) (1a-1f, 3a, 3b, 3c, 3d)

7. Brief list of topics to be covered

- Energy resources, review, electric power generation, energy usage and sustainability;
- Nonrenewable energy sources: Reserves, environmental impacts, policies, and economic cost;
- Renewable energy resources: Energy density, economics, environmental and social costs;
- Solar modules: Operation principles, IV characteristics, effects of temperature and shading;
- Batteries;
- Wind Energy: Components and operation principles, output power estimation and regulation;

- Simulation of PV systems.

