



BIOMASS SYSTEMS FOR HEAT, POWER, AND COGENERATION

Course Number	RE 128
Course Name	BIOMASS SYSTEMS FOR HEAT, POWER, AND COGENERATION
Credit Value (Breakdown of theory and lab credits)	4 credits 2 Theory 2 Studio
Catalog Course Description	You will study biomass, a wide range of heat and energy productions systems that use plant materials. You will also study the range of equipment: from the fire pit to the highly efficient nearly zero-emitting industrial furnaces. You will be introduced to coal-fired power plants, carbon material, and carbon-neutral and carbon-sequestering concepts. You will work with small scale systems and equipment both on- and off-campus. Prerequisite: RE 103. (4, 2T+2S)
Student Learning Outcomes/Objectives /Competencies of the Course	<ul style="list-style-type: none"> • Describe fundamental processes for biomass supply including harvesting, comminution, transportation, drying, and storage; • Describe the fundamentals of processing biomaterials, energy values of biomaterials, and environmental factors related to biomaterials in processing • Be able to identify criteria pollutants and their effects on human health and the environment • Identify the sources of and the definitions used for biomass and basic biomass conversions. • Clearly define the extent of bioenergy use worldwide and the incentives or disincentives for use within the United States. • Introduce traditional thermodynamic and psychrometric relationships • Describe and show the methods used for measuring energy values and related parameters. • Detail the combustion and Gasification Technologies in common use; discuss boilers and boiler terminology • Describe major pollution and environmental issues and their effects on the population with regard to common energy sources. • Detail pollution abatement regimes for biomass and discuss their effectiveness with respect to the population and the environment. • Using wood drying as exemplar, detail the energy use, methods, human health effects and VOC generation of the processes commonly used.
College-Wide Student Learning Outcomes	Cultural Competence

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