

ENGY 200 – Introduction to Energy

Objectives:

- Understand the history of energy development and the technical, economic, environmental, ethical, and political aspects of human-produced energy.
- Apply Physics and Chemistry to the engineering aspects of energy production, transmission, and efficient use.
- Apply Systems Engineering to account for interactions including environmental, ethical, and political challenges requiring economic, scientific, and technical analysis and innovation.

ENGY 200 Introduction to Energy; a survey of human-produced energy. Energy Resources covered include hydro, fossil (petroleum, coal, gas and unconventional), geothermal, wind, solar, biofuels, and nuclear. Energy Conversion Technologies include heat engine cycles (Rankine steam cycle, Brayton cycle gas turbine, Otto and Diesel cycles) and direct energy conversion (photovoltaics and fuel cells). System-level issues are also covered such as energy transmission, coordination of generators, reliability and efficiency. Different energy sources are evaluated in terms of a feasibility matrix of technical, economic, environmental, and political aspects.

Lectures will be augmented with tours and active learning exercises employing discussion of open-ended problems.

Prerequisites: PHGN100 and SYGN101 or BELS198

Instructor: Andy Walker is Principal Engineer at the National Renewable Energy Laboratory and has taught Heat Transfer, Thermodynamics, Energy Conversion, and Design of Solar Buildings in the Mechanical and Architectural Engineering Departments at the University of Colorado at Boulder, the Colorado School of Mines, and Metropolitan State College of Denver. He serves on the Executive Committee of the American Society of Mechanical Engineers Solar Energy Division; has been Associate Editor for the Journal of Solar Energy Engineering; and is General Chair of the ASME Energy Sustainability Conference Aug 7-11, 2011 in Washington DC. Dr. Walker is the author of over 28 book chapters, journal articles, and conference papers and has been recognized with 11 awards from associations and agencies. He is inventor of a stochastic algorithm to evaluate integrated renewable energy technologies. Walker's credentials include a B.S., M.S., and Ph.D. in Mechanical Engineering, and he is a registered Professional Engineer. Ask him about his efforts to get his home to net-zero energy use.

For more information:

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