Energy Engineering (ENER)

Courses

ENER 420. Combined Heat and Power, Design, and Management. 4 hours.
CHP systems construction, operation, economics, and includes a student design project. Also, builds on previous courses in power plants, engines, HVAC, a stress on economic and software analysis, utility rates, and regulations. Course Information: Credit is not given in ENER 420 if the student has credit in ME 420. Prerequisite(s): Open only to Master of Energy Engineering students.

ENER 422. Building Heating, Ventilating, and Air-Conditioning. 4 hours.
Establishes the basic knowledge needed to understand heating and cooling systems, mass transfer in humidification, solar heat transfer in buildings, and psychrometrics. A computer design project will be completed. Course Information: Credit is not given for ENER 422 if the student has credit in ME 422. Prerequisite(s): Open only to Master of Energy Engineering students.

ENER 424. Industrial Energy Management and Conservation. 4 hours.
Beginning course in energy analysis and auditing, and builds upon the critical background established in the HVAC course. An overview of the energy industry, billing, economic analysis, deregulated markets and energy purchasing. Course Information: Credit is not given for ENER 424 if the student has credit in ME 424. Prerequisite(s): Open only to Master of Energy Engineering students.

ENER 429. Internal Combustion Engines. 4 hours.
Introduction to engine types, characteristics and performance. Combustion processes in spark and compression ignition engines; combustion abnormalities. Course Information: Credit is not given for ENER 429 if the student has credit in ME 429. Prerequisite(s): Open only to Master of Energy Engineering students.

ENER 451. Electric Power Generation. 4 hours.
Thermodynamics and practical aspects of central fossil fuel fired electric generating plants. Focus on large steam cycle generating plants, with discussion of geothermal and hydroelectric plants. Course Information: Prerequisite(s): Open only to Master of Energy Engineering students.

ENER 453. Sustainable Energy Engineering and Renewable Energy. 3 or 4 hours.
An in-depth study of renewable energy systems, focusing on the principles, technologies, and applications. It focuses on various renewable energy sources, including solar, wind, hydro, biomass, and geothermal etc. Course Information: Previously listed as ENER 553. Same as ME 453. Recommended Background: ME 321 and ME 325.

ENER 483. Energy Management Solutions for Industry: Theory and Practice. 3 or 4 hours.
Emphasis on real world applications including: understanding utility billing and identifying costs; identifying and quantifying energy savings opportunities at industrial facilities; determining investment payback scenarios and considerations. Course Information: Same as ME 424. 3 undergraduate hours. 4 graduate hours. Extensive computer use required. Field work required. Extensive use of Microsoft Excel. Prerequisite(s): Junior standing or above.

ENER 485. Air Pollution Engineering. 3 or 4 hours.
Environmental aspects of combustion processes, pollutant formation. Control of pollutants and particulates. Air quality control. Fundamentals of combustion. Course Information: Same as CHE 450 and ME 450. 3 undergraduate hours. 4 graduate hours. Prerequisite(s): ME 321 or consent of the instructor.

ENER 494. Special Topics in Energy Engineering. 4 hours.
Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor.

ENER 501. Engineering Project Coordination and Management. 4 hours.
Theory, strategy, and tactics of the use of project management including project planning, matrix management concept, and team meetings. Course Information: Prerequisite(s): Open only to Master of Energy Engineering students.

ENER 552. Design of Energy Efficient Buildings. 4 hours.
Emerging technologies in designing energy efficient buildings, including new code issues. Course Information: Prerequisite(s): Open only to Master of Energy Engineering students.

ENER 554. Nuclear Power Generation. 4 hours.
Theoretical and practical aspects of nuclear power generation, operations, reactor design, power train design, licensing, regulation, health, safety, maintenance on new and existing plants. Course Information: Prerequisite(s): ENER 451 and ME 205; or consent of the instructor.

ENER 555. Energy Markets and Contracting. 4 hours.
Focuses on how energy markets work, how energy prices are determined, how financial markets operate through options and futures markets, and how consumers can use new technologies with appropriate contracting terms to minimize energy costs. Course Information: Prerequisite(s): Graduate standing; or consent of the instructor.

ENER 594. Current Topics in Energy Engineering. 4 hours.
Particular topics vary from term to term depending on the interests of the students and the specialties of the instructor.