Energy Systems Engineering (ESE)

Courses

ESE 401 Energy Generation 3 Credits
This course provides an overview of the different methods of
generating electricity, such as turbine driven electrochemical
generators, fuel cells, photovoltaics, and thermoelectric devices.
Topics include the combustion of fossil fuels (coal, natural gas, and
oil), nuclear fission and fusion, and renewable resources (solar,
wind, hydro, tidal, and geothermal sources). Sustainability, energy
efficiency issues, as well as public interest and policy drivers are also
addressed.

ESE 402 Transmission & Distribution: Smart Grid 3 Credits
This course provides an overview of modern power transmission
and distribution systems. Topics include transformer technology,
transmission grids, load management, distribution optimization,
power supply reliability, and infrastructure systems. Security and
deregulation issues are also addressed.

ESE 403 Energy And The Environment 3 Credits
This course provides an overview of the direct and indirect impact of
energy generation and transmission technologies on the environment.
Topics include global climate change, clean energy technologies,
energy conservation, air pollution, water resources, and nuclear waste
issues.

ESE 405 Energy Systems Project Management 3 Credits
This course introduces students to the basics of project management
in the field of energy systems, which includes the broad spectrum of
empirical, theoretical and policy issues of managing the electric power
grid, its generation facilities and equipment. This focuses on the key
elements of case studies in engineering that focus on the effective
project management of tomorrow's intelligent energy system.

ESE 460 Energy Systems Engineering Project 3-6 Credits
A collaborative and intensive study in an area of energy systems
over 2 semesters on an industry-sponsored project worth 6 credits.
The selected project consider themes of current interest: the use
of renewable energy, and efficient planning and development of
energy communities to reduce carbon footprint. The student applies
principles of energy project management in the planning, execution
and completion. The student presents their results at the end of each
semester to an audience of peers, faculty & industry personnel.
Repeat Status: Course may be repeated.

ESE 461 Energy Seminars and Field Trips 3 Credits
This course provides a rich mix of presentations and field trips from
industry experts in current energy technologies and challenges as
the industry strives to decarbonize. The topics include the role of
central generation facilities—the bulwark and working horse for
over a century—over the next decade, how climate change targets
would require decarbonizing some key industries and exploration
of alternative clean fuels, and the role of the utility customer who is
increasingly a partner of the modern grid.