

ENERGY SYSTEMS ENGINEERING (ESE)

ESE LDEA, LOWER DIVISION ED ABROAD, 0-16 Credits

This course is repeatable for 99 credits.

ESE UDEA, UPPER DIVISION ED ABROAD, 0-16 Credits

This course is repeatable for 99 credits.

ESE 330, MODELING AND ANALYSIS OF DYNAMIC SYSTEMS, 4 Credits

Presents basic concepts of dynamic behavior, and the analytical and computational techniques for predicting and assessing dynamic behavior. Focuses on modeling a basic system, compound system, dynamic stability, and natural behavior to continuing and abrupt inputs.

Prerequisite: ENGR 202 with C or better and (ENGR 212 [C] or ENGR 212H [C] or ME 217 [C]) and (MTH 256 [C] or MTH 256H [C]) and (MTH 264 [C] or MTH 264H [C] or MTH 341 [C])

ESE 355, ENERGY REGULATION, 4 Credits

Introductory course to the policies and laws governing energy generation and transmission in the United States with a focus on electricity. History of regulations give context to understand current regulation and potential future policies. Laws regulating the use of alternative energy resources covered in a practical setting.

Prerequisite: BA 360 (may be taken concurrently) with C or better or ENGR 390 (may be taken concurrently) with C or better

ESE 360, ENERGY CONSUMPTION ANALYSIS, 4 Credits

Analyzes energy use in transportation, residential, and industrial sectors to understand how new technologies improve energy efficiency. Applies tradeoff techniques to decide between less efficient, less expensive systems versus more efficient, more expensive systems. Compares international energy consumption and evaluates energy losses for heating, cooling and electronic systems.

Prerequisite: (BA 360 (may be taken concurrently) with C or better or BA 360H (may be taken concurrently) with C or better or ENGR 390 (may be taken concurrently) with C or better) and (ME 310 [C] or NSE 310 [C] or ME 311 [C] or ME 311H [C] or NSE 311 [C] or NSE 311H [C])

ESE 401, RESEARCH, 1-4 Credits

Equivalent to: ESC 401

This course is repeatable for 4 credits.

ESE 410, INTERNSHIP, 1-4 Credits

Equivalent to: ESC 410

ESE 430, FEEDBACK CONTROL SYSTEMS, 4 Credits

Modeling and analysis of linear, continuous-time systems in the time and frequency domains. Fundamentals of single-input-single-output control system design using both time-domain and frequency-domain techniques.

Prerequisite: ESE 330 with C or better

ESE 450, ENERGY GENERATION SYSTEMS, 4 Credits

Survey of technical fundamentals and operational principles of conventional and renewable energy conversion systems to understand the environmental and sustainable issues for energy systems currently in use or may be used in the future to power our industrial society.

Prerequisite: ME 310 with C or better or NSE 310 with C or better or ME 312 with C or better or ME 312H with C or better or NSE 312 with C or better or NSE 312H with C or better

ESE 470, ELECTRICAL ENERGY DISTRIBUTION SYSTEMS, 4 Credits

Modeling and analysis of electrical power systems and power system equipment, including transformers and transmission lines. Computational methods applied to power flow analysis. Fault analysis utilizing the method of symmetrical components.

Prerequisite: ENGR 202 with C or better

ESE 471, ENERGY STORAGE SYSTEMS, 4 Credits

Covers energy storage techniques involving electrochemical, mechanical and emerging options. Integrates energy storage media, its effects on the bulk power system, and design tradeoffs to understand environmental impacts, cost, reliabilities, and efficiencies for commercialization of bulk energy storage.

Prerequisite: ENGR 202 with C or better and (ME 310 [C] or ME 312 [C] or ME 312H [C] or NSE 312 [C] or NSE 312H [C])

ESE 499, SPECIAL TOPICS, 1-16 Credits

This course is repeatable for 16 credits.