

ENERGY SYSTEMS ENGINEERING (ESE)

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. Modeling a basic system, compound system, dynamic stability, and natural behavior to continuing and abrupt inputs are presented.

Prerequisite: ENGR 202 with C or better and ENGR 212 [C] and MTH 256 [C] and MTH 306 [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. Offered at OSU-Cascades only.

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

Analysis of energy use in transportation, residential and industrial sectors to understand how new technologies improve energy efficiency. Tradeoff techniques applied to decide between less efficient, less expensive systems versus more efficient, more expensive systems. International energy consumption compared, and energy losses evaluated for heating, cooling and electronic systems. Offered at OSU-Cascades only.

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

ESE 401, RESEARCH, 1-16 Credits

Equivalent to: ESC 401

This course is repeatable for 4 credits.

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. Offered at OSU-Cascades only.

Prerequisite: ME 312 with C or better

ESE 470, ENERGY DISTRIBUTION SYSTEMS, 4 Credits

Detailed coverage of the electrical energy distribution system, its operation, control and design. Design considerations and impacts to meet emerging and evolving customer needs. Broader understanding of natural gas and oil pipeline distribution for these infrastructure commodities. Offered at OSU-Cascades only.

Prerequisite: ENGR 202 with C or better and ME 311 [C]

ESE 471, ENERGY STORAGE SYSTEMS, 4 Credits

Coverage of energy storage techniques involving electrochemical, mechanical and emerging options. Integration of the 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. Offered at OSU-Cascades only.

Prerequisite: ENGR 202 with C or better and ME 312 [C]

ESE 497, ^MIME CAPSTONE DESIGN, 4 Credits

Product design; selection and replacement of major tools, processes, and equipment; paperwork controls; subsystem revision; system or plant revision; selection and training of personnel; long-run policies and strategy. CROSSLISTED as ESC 497/ESE 497. (Writing Intensive Course)

Attributes: CWIC – Core, Skills, WIC

Prerequisite: (ENGR 390 with C or better or BA 360 with C or better) and IE 425 [C] and (ME 312 [C] or ME 312H [C]) and (ME 331 [C] or ME 331H [C]) and ESE 355 [C] and ESE 360 [C] and (ST 314 [C] or ST 314H [C]) and WR 327 [C]

Equivalent to: IE 497, ME 497, MIME 497

ESE 498, ^MIME CAPSTONE DESIGN, 4 Credits

Product design; selection and replacement of major tools, processes, and equipment; paperwork controls; subsystem revision; system or plant revision; selection and training of personnel; long-run policies and strategy. (Writing Intensive Course)

Attributes: CWIC – Core, Skills, WIC

Prerequisite: ESE 497 with C or better or IE 497 with C or better or ME 497 with C or better or MIME 497 with C or better

Equivalent to: ESC 498, IE 498, ME 498

ESE 499, SPECIAL TOPICS, 0-16 Credits

This course is repeatable for 16 credits.