ENERGY SYSTEMS ENGINEERING
UNDERGRADUATE MAJOR (BS, HBS)

Available only at OSU-Cascades.

At Oregon State University, the Energy Systems Engineering degree program combines engineering fundamentals with energy-focused technical courses and business management classes. This multidisciplinary curriculum provides students with a strong foundation in the core principles of mechanical, electrical and industrial engineering.

Program Educational Objectives—Energy Systems Engineering

Note: The Bachelor of Science and Honors Bachelor of Science degrees in Energy Systems Engineering are accredited by the Engineering Accreditation Commission of ABET, http://www.ABET.org (http://www.abet.org/), which requires stated program educational objectives and student outcomes to support these.

OSU Energy Systems Engineering graduates receive an innovative education, and within 3 to 5 years of graduation will have:

1. Created value to organizations through the analysis, evaluation, and improvement of engineered systems and processes using appropriate systems engineering methods and tools.
2. Communicated effectively across disciplines and cultures to manage and/or lead activities in support of organizational goals and objectives.
3. Innovated systems and processes, in response to organizational challenges, though the application of structured and unstructured systems engineering methodologies, including engineering design and problem-solving.

Major Code: 293

• Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
• Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
• Communicate effectively with a range of audiences.
• Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
• Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
• Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
• Acquire and apply new knowledge as needed, using appropriate learning strategies.

Code Title Credits
WR 121 *ENGLISH COMPOSITION 3

Energy Systems Engineering Undergraduate Major (BS, HBS) 1

WR 327 *TECHNICAL WRITING 3
COMM 111 *PUBLIC SPEAKING 3
or COMM 114 *ARGUMENT AND CRITICAL DISCOURSE 3

Skills
HHS 231 *LIFETIME FITNESS FOR HEALTH 2
HHS 241 *LIFETIME FITNESS (or any PAC course) 1-2

Perspectives
Western Culture 3
Cultural Diversity 3
Literature & The Arts 3
ECON 201 *INTRODUCTION TO MICROECONOMICS 4

Synthesis
SUS 350 *SUSTAINABLE COMMUNITIES 4
Science, Technology & Society 3

Math and Science
CH 201 CHEMISTRY FOR ENGINEERING MAJORS 3-4
or CH 231 GENERAL CHEMISTRY 3
CH 202 CHEMISTRY FOR ENGINEERING MAJORS 4-5
& CH 205 and LABORATORY FOR CH 202 4-5
or CH 232 GENERAL CHEMISTRY 3
& CH 261 and *LABORATORY FOR CHEMISTRY 231 3

MTH 251 *DIFFERENTIAL CALCULUS 4
MTH 252 INTEGRAL CALCULUS 4
MTH 254 VECTOR CALCULUS I 4
MTH 256 APPLIED DIFFERENTIAL EQUATIONS 4
MTH 341 LINEAR ALGEBRA I 3
PH 211 *GENERAL PHYSICS WITH CALCULUS 4
PH 212 *GENERAL PHYSICS WITH CALCULUS 4
PH 213 *GENERAL PHYSICS WITH CALCULUS 4
ST 314 INTRODUCTION TO STATISTICS FOR ENGINEERS 3

Biological Science Elective

Business Management Courses
BA 357 OPERATIONS MANAGEMENT 4
ENGR 390 ENGINEERING ECONOMY 3
IE 471 PROJECT MANAGEMENT IN ENGINEERING 3

Engineering
IE 212 COMPUTATIONAL METHODS FOR INDUSTRIAL ENGINEERING 4
ESE 330 MODELING AND ANALYSIS OF DYNAMIC SYSTEMS 4
ESE 355 ENERGY REGULATION 4
ESE 360 ENERGY CONSUMPTION ANALYSIS 4
ESE 430 FEEDBACK CONTROL SYSTEMS 4
ESE 450 ENERGY GENERATION SYSTEMS 4
ESE 470 ENERGY DISTRIBUTION SYSTEMS 4
ESE 471 ENERGY STORAGE SYSTEMS 4
ESE 497 *MIME CAPSTONE DESIGN 4
ESE 498 *MIME CAPSTONE DESIGN 4
ENGR 112 INTRODUCTION TO ENGINEERING COMPUTING 3
ENGR 201 ELECTRICAL FUNDAMENTALS I 3
ENGR 202 ELECTRICAL FUNDAMENTALS II 3
ENGR 211 STATICS 3
ENGR 212 DYNAMICS 3
IE 415 SIMULATION AND DECISION SUPPORT SYSTEMS 4
IE 425 INDUSTRIAL SYSTEMS OPTIMIZATION 4
ME 311/NSE 311 INTRODUCTION TO THERMAL-FLUID SCIENCES 4
ME 312/NSE 312 THERMODYNAMICS 4
ME 331/NSE 331 INTRODUCTORY FLUID MECHANICS 4
ME 332/NSE 332 HEAT TRANSFER 4
MIME 101 INTRODUCTION TO MIME 3
| Restricted Technical Electives (no more than 3 credits from 200-level courses) | 7 |
| Total Credits | 180-182 |

* Baccalaureate Core Course (BCC)

^ Writing Intensive Course (WIC)

**Major Code: 293**