

# Energy Systems, MSENES—ALIGN Program

Website ([http://www.northeastern.edu/align/academic\\_program/master-of-science-in-energy-systems](http://www.northeastern.edu/align/academic_program/master-of-science-in-energy-systems))

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Designing and implementing optimal methods to produce and utilize energy is one of the most pressing global issues today. Finding ways to implement these solutions that are sustainable and marketable is key. The energy systems ALIGN program is meant to provide students of all disciplines with the foundation skills necessary to gain the skills needed to create and implement energy solutions. Students will begin the program by taking two core courses that cover topics across thermosciences and math.

The ALIGN core courses will provide students with an introduction to the fundamentals that are necessary to be successful in the energy system program. Once students complete the ALIGN courses they will move through our multidisciplinary energy systems curriculum that integrates engineering, business, and policy. Our curriculum is flexibly designed with a set of core courses in engineering and finance complemented by a range of electives across five different academic colleges. Our core and elective courses will help to prepare students to lead the efforts to implement energy systems solutions that have a long-term positive effect on businesses and communities.

## Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

### Core Requirements

#### ALIGN Course Work

Complete the following (repeatable) course twice: 8

ENSY 7374	Special Topics in Energy Systems	
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#### Core

EMGT 6225	Economic Decision Making	4
ENSY 5000	Fundamentals of Energy System Integration	4
ME 6200	Mathematical Methods for Mechanical Engineers 1	4
FINA 6309	Foundations of Accounting and Finance	3,4

### Options

Complete one of the following options:

#### GENERAL OPTION

Complete 16 semester hours from the following: 16

CHEM 5651	Materials Chemistry of Renewable Energy	
CHEM 5652	Fundamental Science of Photovoltaics	
CHME 5204	Heterogeneous Catalysis	
CHME 5630	Biochemical Engineering	

CIVE 5270	Environmental Protection and Management
EECE 5680	Electric Drives
EECE 5682	Power Systems Analysis 1
EECE 5684	Power Electronics
EECE 5686	Electrical Machines
EECE 7239	Special Topics in Power Systems
EECE 7398	Special Topics
EMGT 5220	Engineering Project Management
ENGR 5670	Sustainable Energy: Materials, Conversion, Storage, and Usage
ENSY 5585	Wind Energy Systems
ENSY 7374	Special Topics in Energy Systems
ENSY 7978	Independent Study
ME 5645	Environmental Issues in Manufacturing and Product Use
ME 5685	Solar Thermal Engineering
ME 5690	Gas Turbine Combustion
ME 7270	General Thermodynamics
ME 7300	Combustion and Air Pollution
ME 7305	Fundamentals of Combustion
OR 6205	Deterministic Operations Research
SBSY 5200	Sustainable Engineering Systems for Buildings

#### Non Technical Electives

A maximum of 5 semester hours may be taken from the following list toward the elective requirement:

ARCH 5210 and ARCH 5211	Environmental Systems and Recitation for ARCH 5210
FINA 6203	Investment Analysis
FINA 6205	Financial Strategy
FINA 6215	Business Turnarounds
PPUA 7238	Climate Change and Urbanization in Developing Countries
or LPSC 7312	Cities, Sustainability, and Climate Change

#### Online/Hybrid Option

Complete 16 semester hours from the following. Electives outside this list may be chosen in consultation with faculty advisor.

CIVE 5270	Environmental Protection and Management
EECE 5682	Power Systems Analysis 1
EECE 7398	Special Topics
EMGT 5220	Engineering Project Management
IE 6200	Engineering Probability and Statistics
OR 6205	Deterministic Operations Research
ME 5645	Environmental Issues in Manufacturing and Product Use
ME 5685	Solar Thermal Engineering
ME 7270	General Thermodynamics

**Program Credit/GPA Requirements**

40 total semester hours required

Minimum 3.000 GPA required