CHEMICAL ENGINEERING MAJOR: ENERGY OPTION (B.S.)

https://ceps.unh.edu/chemical-bioengineering/program/bsche/chemical-engineering-major-energy-option

Description

This option covers the major areas of current interest in the energy field. The required courses provide students with a general background knowledge of fossil fuels, nuclear power, solar energy, and other alternative energy resources. The elective courses will permit the student to study topics of special interest in more depth or gain a broader perspective on energy and some closely related subjects. Three courses are required, and one additional course of at least three credits should be selected from the electives list. Students interested in the energy option should declare their intention to the department faculty during the sophomore year.

The Chemical Engineering program (B Sci in Chemical Engineering) is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the General Criteria and the Program Criteria for Chemical, Biochemical, Biomolecular and Similarly Named Engineering Programs.

Requirements

Degree Requirements

Minimum Credit Requirement: 132 credits

Minimum Residency Requirement: 32 credits must be taken at UNH

Minimum GPA: 2.0 required for conferral*

Core Curriculum Required: Discovery & Writing Program Requirements

Foreign Language Requirement: No

All Major, Option and Elective Requirements as indicated.

*Major GPA requirements as indicated.

Major Requirements

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>CHBE 400</td>
<td>Chemical and Bioengineering Lectures</td>
<td>1</td>
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<tr>
<td>CHBE 501</td>
<td>Material Balances</td>
<td>3</td>
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<td>CHBE 502</td>
<td>Energy Balances</td>
<td>3</td>
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<tr>
<td>CHBE 601</td>
<td>Fluid Mechanics and Unit Operations</td>
<td>3</td>
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<tr>
<td>CHBE 602</td>
<td>Heat Transfer and Unit Operations</td>
<td>3</td>
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<tr>
<td>CHBE 603</td>
<td>Applied Mathematics for Chemical Engineers</td>
<td>4</td>
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<tr>
<td>CHBE 604</td>
<td>Chemical Engineering Thermodynamics</td>
<td>3</td>
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<tr>
<td>CHBE 612</td>
<td>Chemical Engineering Laboratory I</td>
<td>3</td>
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<tr>
<td>CHBE 614</td>
<td>Separation Processes</td>
<td>3</td>
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<td>CHBE 703</td>
<td>Mass Transfer and Stagewise Operations</td>
<td>3</td>
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<tr>
<td>CHBE 705</td>
<td>Fossil Fuels and Renewable Energy Sources</td>
<td>4</td>
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<tr>
<td>CHBE 706</td>
<td>Electrochemical Methods: Fundamentals and Applications</td>
<td>4</td>
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<tr>
<td>CHBE 707</td>
<td>Chemical Engineering Kinetics</td>
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<tr>
<td>CHBE 708</td>
<td>Chemical Engineering Design</td>
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Required Courses

CHBE 712 Introduction to Nuclear Engineering
CHBE 713 Chemical Engineering Laboratory II
CHBE 752 Process Dynamics and Control
CHEM 405 Chemical Principles for Engineers
CHEM 683 Physical Chemistry I
CHEM 684 Physical Chemistry II
CHEM 685 Physical Chemistry Laboratory
CHEM 686 Physical Chemistry Laboratory
CHEM 651 Organic Chemistry I
CHEM 652A Organic Chemistry II
CHEM 653 Organic Chemistry Laboratory
MATH 425 Calculus I
MATH 426 Calculus II
MATH 527 Differential Equations with Linear Algebra
MATH 644 Statistics for Engineers and Scientists
PHYS 407 General Physics I
PHYS 408 General Physics II

Elective Courses

Select one of the following: 3-4

CHBE 695 Chemical Engineering Project
CHBE 696 Independent Study
CHBE 761 Biochemical Engineering
ME 705 Thermal System Analysis and Design
ME 706 Renewable Energy: Physical and Engineering Principles
NR #606 International Energy Topics
NR 787 Advanced Topics in Sustainable Energy

Total Credits 104-105

1 This requires approval of the department; students should check with their advisor. Courses offered in the past include Renewable Electrical Power, Renewable Energy, and Peak Oil.

Student Learning Outcomes

By the time of graduation, students will have

• an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

• an ability to 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.

• an ability to communicate effectively with a range of audiences.

• an ability to 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.

• an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

• an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

• an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.