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

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.

Requirements

Degree Requirements

Minimum Credit Requirement: 128 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHBE 400</td>
<td>Chemical and Bioengineering Lectures</td>
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<tr>
<td>CHBE 501</td>
<td>Material Balances</td>
<td>3</td>
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<tr>
<td>CHBE 502</td>
<td>Energy Balances</td>
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<tr>
<td>CHBE 503</td>
<td>Fluid Mechanics and Unit Operations</td>
<td>3</td>
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<tr>
<td>CHBE 504</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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<td>CHBE 604</td>
<td>Chemical Engineering Thermodynamics</td>
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<td>CHBE 612</td>
<td>Chemical Engineering Laboratory I</td>
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<td>CHBE 614</td>
<td>Separation Processes</td>
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<td>CHBE 703</td>
<td>Mass Transfer and Stagewise Operations</td>
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<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 for Energy Applications</td>
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<td>CHBE 707</td>
<td>Chemical Engineering Kinetics</td>
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<td>CHBE 708</td>
<td>Chemical Engineering Design</td>
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<td>CHBE 712</td>
<td>Introduction to Nuclear Engineering</td>
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<td>CHBE 713</td>
<td>Chemical Engineering Laboratory II</td>
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<td>CHBE 752</td>
<td>Process Dynamics and Control</td>
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<td>CHEM 405</td>
<td>Chemical Principles for Engineers</td>
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<td>CHEM 583</td>
<td>Physical Chemistry I</td>
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<tr>
<td>CHEM 684</td>
<td>Physical Chemistry II</td>
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<tr>
<td>CHEM 685</td>
<td>Physical Chemistry Laboratory</td>
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</table>

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 666 | 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 chemical 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.