Chemical Engineering (MS)

Master of Science Degree Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Required Courses</strong></td>
<td><strong>12</strong></td>
</tr>
<tr>
<td>CHE 711</td>
<td>Chemical Engineering Process Modeling</td>
<td>3</td>
</tr>
<tr>
<td>CHE 713</td>
<td>Thermodynamics I</td>
<td>3</td>
</tr>
<tr>
<td>CHE 715</td>
<td>Transport Phenomena</td>
<td>3</td>
</tr>
<tr>
<td>CHE 717</td>
<td>Chemical Reaction Engineering</td>
<td>3</td>
</tr>
</tbody>
</table>

**Thesis Options**

**Thesis**

"Elective Courses" will be determined in conjunction with the academic committee to meet the 30 total hour requirement.

**Non-Thesis**

"Elective Courses" will be determined in conjunction with the academic committee to meet the 30 total hour requirement.

**Total Hours**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Hours</td>
<td>30</td>
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</tbody>
</table>

* Non-CHE undergraduate majors are required to take CHE 596 Core Concepts I and CHE 596 Core Concepts II before they can take any 700-level courses.

**CHE Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>CHE 543</td>
<td>Polymer Science and Technology</td>
<td>3</td>
</tr>
<tr>
<td>CHE 551</td>
<td>Biochemical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CHE 560</td>
<td>Chemical Processing Of Electronic Materials</td>
<td>3</td>
</tr>
<tr>
<td>CHE 562</td>
<td>Fundamentals of Bio-Nanotechnology</td>
<td>3</td>
</tr>
<tr>
<td>CHE 563</td>
<td>Fermentation of Recombinant Microorganisms</td>
<td>2</td>
</tr>
<tr>
<td>CHE 568</td>
<td>Conventional and Emerging Nanomanufacturing</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Techniques and Their Applications in Nanosystems</td>
<td></td>
</tr>
<tr>
<td>CHE 577</td>
<td>Advanced Biomanufacturing and Biocatalysis</td>
<td>3</td>
</tr>
<tr>
<td>CHE 596</td>
<td>Special Topics in Chemical Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>(Core Chemical Engineering Concepts I (required of all non ChE majors; not available for others))</td>
<td></td>
</tr>
<tr>
<td>CHE 596</td>
<td>Special Topics in Chemical Engineering</td>
<td>1-3</td>
</tr>
<tr>
<td></td>
<td>(Core Chemical Engineering Concepts II (required of all non ChE majors; not available for others))</td>
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<tr>
<td>CHE 596</td>
<td>Special Topics in Chemical Engineering (Colloid Science &amp; Nanoscale Engineering)</td>
<td>1-3</td>
</tr>
<tr>
<td>CHE 596</td>
<td>Special Topics in Chemical Engineering (Green Chemical Engineering)</td>
<td>1-3</td>
</tr>
<tr>
<td>CHE 596</td>
<td>Special Topics in Chemical Engineering (Molecular 1-3 Cell Engineering)</td>
<td>1-3</td>
</tr>
<tr>
<td>CHE 596</td>
<td>Special Topics in Chemical Engineering (Chemical 1-3 Process Engineering)</td>
<td>1-3</td>
</tr>
<tr>
<td>CHE 596</td>
<td>Special Topics in Chemical Engineering (Polymer Rheology and Processing)</td>
<td>1-3</td>
</tr>
<tr>
<td>CHE 596</td>
<td>Special Topics in Chemical Engineering (Drug Delivery Concepts)</td>
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</tr>
<tr>
<td></td>
<td>Chemical Engineering Projects</td>
<td>1-3</td>
</tr>
<tr>
<td>CHE 711</td>
<td>Chemical Engineering Process Modeling</td>
<td>3</td>
</tr>
<tr>
<td>CHE 713</td>
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</tr>
<tr>
<td>CHE 717</td>
<td>Chemical Reaction Engineering</td>
<td>3</td>
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<tr>
<td>CHE 761</td>
<td>Polymer Blends and Alloys</td>
<td>3</td>
</tr>
<tr>
<td>CHE 775</td>
<td>Multi-Scale Modeling of Matter</td>
<td>3</td>
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<tr>
<td>MA 501</td>
<td>Advanced Mathematics for Engineers and Scientists I</td>
<td>3</td>
</tr>
</tbody>
</table>

**Accelerated Bachelor's/Master's Degree Requirements**

The Accelerated Bachelors/Master's (ABM) degree program allows exceptional undergraduate students at NC State an opportunity to complete the requirements for both the Bachelor's and Master's degrees at an accelerated pace. These undergraduate students may double count up to 12 credits and obtain a non-thesis Master's degree in the same field within 12 months of completing the Bachelor's degree, or obtain a thesis-based Master's degree in the same field within 18 months of completing the Bachelor's degree.

This degree program also provides an opportunity for the Directors of Graduate Programs (DGPs) at NC State to recruit rising juniors in their major to their graduate programs. However, permission to pursue an ABM degree program does not guarantee admission to the Graduate School. Admission is contingent on meeting eligibility requirements at the time of entering the graduate program.

**Faculty**

**Full Professors**

- Ruben G. Carbonell
- Joseph M. DeSimone
- Michael David Dickey
- Peter S. Fedkiw
- Jan Genzer
- Christine S. Grant
- Keith E. Gubbins
- Carol K. Hall
- Jason M. Haugh
- Hasan Jameel
- Robert M. Kelly
- Saad A. Khan
- Harold Henry Lamb
- Fanxing Li
- Phooi K. Lim
- Gregory N Parsons
Behnam Pourdeyhimi
Balaji M. Rao
Richard J. Spontak
Orlin Dimitrov Velev
Phillip R. Westmoreland

Associate Professors
Chase Beisel
Steven W. Peretti
Erik Emilio Santiso

Assistant Professors
Milad Abolhasani
Nathan Crook
Chien Ching Lilian Hsiao
Albert Jun Qi Keung
Stefano Menegatti
Adriana San Miguel Delgadillo
Qingshan Wei

Practice/Research/Teaching Professors
Lisa G. Bullard
Matthew Ellis Cooper
Kirill Efimenko
Gary Louis Gilleskie
Luke Neal
John H. van Zanten

Emeritus Faculty
Richard M. Felder
Michael Carl Flickinger
Harold B. Hopfenberg
David Frederick Ollis
Hubert Winston

Adjunct Faculty
Anthony L. Andrade
Christina Boi