CHEMICAL AND BIOMOLECULAR ENGINEERING, PHD

Program Requirements
The Ph.D. degree is awarded for original research performed under the guidance of a thesis advisor. The formal requirements for this degree are:

1. Completion of six graduate-level courses including the four required core courses
2. Completion of an annual research evaluation each year.
3. Serve as a teaching assistant for at least two required courses.
4. Completion in the first semester of departmental safety requirements (see Handbook for more information).
5. Attend graduate seminars (EN.540.600 Chemical and Biomolecular Engineering Seminar/EN.540.601 Chemical and Biomolecular Engineering Seminar) every semester. Students are expected to enroll and attend department seminars throughout their tenure in the department.
7. Completion of an original research project, documented in a dissertation that is defended by the candidate in a public presentation.
8. Completion of Responsible Conduct of Research training. For complete information, see https://engineering.jhu.edu/wse-research/resources-policies-forms/responsible-conduct-of-research/online-training-course-for-the-responsible-conduct-of-research/
9. Completion of Academic Ethics (EN.500.603 Graduate Orientation and Academic Ethics)
10. Application for Graduation submitted to Registrar's office.

Ph.D. Course Work
Students must successfully complete six graduate-level courses including the four required core courses listed below.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN.540.630</td>
<td>Thermodynamics &amp; Statistical Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>EN.540.652</td>
<td>Advanced Transport Phenomena</td>
<td>3</td>
</tr>
<tr>
<td>EN.540.602</td>
<td>Metabolic Systems Biotechnology</td>
<td>3</td>
</tr>
<tr>
<td>EN.540.615</td>
<td>Interfacial Science with Applications to Nanoscale Systems</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Credits</strong></td>
<td></td>
<td><strong>12</strong></td>
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</table>

Ph.D. Students are strongly encouraged to take the four required courses in the first fall semester. However, students who do not have an undergraduate degree in Chemical Engineering or a closely related field may need additional courses and should discuss an appropriate course plan with the Director of the Graduate Program at the start of their first semester.