With financial support from the North Carolina Biotechnology Center, UNC-Chapel Hill and NC State University offer graduate certificates in nanobiotechnology. Tremendous advances in development of nanoscale, nanostructured, and nano-enabled materials for biotechnology applications are currently taking place. In particular, the development of advanced materials (e.g., electronic materials, optical materials, biologically-derived materials, and nanoscale materials) will allow for the development of next generation systems for use in medicine, homeland defense, and agriculture. These systems will provide integration of multiple functions, miniaturization of devices, an increase in stability, and a decrease in cost. In order for universities, companies, and governmental agencies to pursue this highly specialized work, students must be trained at the graduate level to perform work at the interface of nanoscale science and biotechnology. The nanobiotechnology certificates are aligned with the need for highly trained professionals to nurture rapid growth of nanobiotechnology infrastructure in North Carolina. The keystone of the certificates at both universities is a core nanobiotechnology course (BME 540, 3 credit hours), in which lectures, open discussion, and student presentations will be used to introduce students to this area of study.

### Plan Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
<th>Counts towards</th>
</tr>
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<tbody>
<tr>
<td>BME 540</td>
<td>Nanobiotechnology Processing, Characterization, and Applications</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Select nine hours of electives: 9

- **BEC/CHE 562**: Fundamentals of Bio-Nanotechnology (courses also offered at UNC-CH)
- **CH 747**: Nanobiotechnology
- **BIT 501**: Ethical Issues in Biotechnology
- **BME 566**: Polymeric Biomaterials Engineering
- **MSE 539**: Advanced Materials

**Total Hours**: 12