P.C. Rossin College of Engineering and Applied Science

Stephen P. DeWeerth, Dean
John P. Coulter, Senior Associate Dean for Research
Sabrina Jedlicka, Associate Dean for Academic Affairs
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The P.C. Rossin College of Engineering and Applied Science offers the bachelor of science degree in 17 programs, combining a strong background in sciences and mathematics with requirements in humanities and social sciences. Students in college programs learn principles they can apply immediately in professional work; those who plan on further academic experience can design a curriculum centering on interests they will pursue in graduate school.

The mission of the college is to prepare undergraduate and graduate students to be critical thinkers, problem solvers, innovators, leaders and life-long learners in a global society and to create an environment where students pursue cutting-edge research in engineering and engineering science.

DEGREE PROGRAMS

The P.C. Rossin College of Engineering and Applied Science includes eight departments and offers undergraduate and graduate degree programs at the bachelor, master, and doctor of philosophy levels.

The undergraduate degree programs leading to the bachelor of science degree are:

- Applied Science
- Biocomputational Engineering
- Bioengineering
- Chemical Engineering
- Chemistry
- Civil Engineering
- Computer Engineering
- Computer Science
- Computer Science And Business
- Electrical Engineering
- Engineering Mechanics
- Engineering Physics
- Environmental Engineering
- Industrial & Systems Engineering
- Integrated Business And Engineering
- Integrated Degree In Engineering, Arts And Sciences
- Materials Science And Engineering
- Mechanical Engineering
- Materials Science And Engineering
- Environmental Engineering
- Environmental Engineering
- Mechanical Engineering
- Mechanical Engineering
- Mechanical Engineering
- Mechanical Engineering

Programs in chemistry and physics have been approved by the faculty program review committee in these disciplines.

FIRST YEAR COURSES FOR ENGINEERING DEGREES

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<thead>
<tr>
<th>First Year</th>
<th>First Semester</th>
<th>CR</th>
<th>Second Semester</th>
<th>CR</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>ENGL 001</td>
<td>3</td>
<td>ENGL 002</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATH 021</td>
<td>4</td>
<td>MATH 022</td>
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<tr>
<td></td>
<td>ENGR 005</td>
<td>2</td>
<td>Select one of the following:</td>
<td>5-6</td>
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<td>CHM 030 &amp; ENGR 010</td>
<td>6</td>
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<td></td>
<td>PHY 011 &amp; PHY 012</td>
<td>5</td>
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<td></td>
<td>HSS Elective</td>
<td>3-4</td>
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Total Credits: 29-32

Bioengineering students take CHM 030 and ENGR 010 in the fall along with BIOE 001 instead of ENGR 005. In the spring they take BIOS 041 (instead of HSS elective) along with PHY 011/PHY 012. The HSS elective is pushed to later semesters. Students in Computer Science and Business, Integrated Business and Engineering, and Integrated Degree in Engineering, Arts and Sciences follow a different first year curriculum.

MINIMUM HUMANITIES/SOCIAL SCIENCES (HSS) REQUIREMENTS FOR ALL ENGINEERING PROGRAMS

Basic Requirement

Economics and English. Three courses totaling a minimum of ten credit hours: Students must complete all three:

- ECO 001 Principles of Economics
- ENGL 001 Critical Reading and Composition
- or ENGL 003 Composition and Literature I for International Writers
- ENGL 002 Research and Argument
- or ENGL 005 Composition and Literature II for International Writers
- or ENGL 011 Seminar in Critical Reading & Writing

Note: ENGL 011 is only for students with AP credit for ENGL 001

Total Credits
The Co-Directors of the IBE Honors Program are Robert H. Storer, Professor of Industrial and Systems Engineering (rhs2@lehigh.edu) and Richard J. Kish, Professor of Finance (rjk7@lehigh.edu). For additional information, see the IBE Honors Program or visit the IBE web site at www.lehigh.edu/~inibep/inibep.html (http://www.lehigh.edu/~inibep/inibep.html).

Integrated Degree Engineering, Arts and Sciences (IDEAS) Honors Program

The B.S. in Integrated Engineering, Arts and Sciences (IDEAS) provides students with a unique opportunity to combine the breadth and depth of two focus areas, one from engineering and one from arts and sciences in a four-year experience. More information is available in the IDEAS entry in this catalog, or online at www.lehigh.edu/ideas (http://www.lehigh.edu/ideas/).

Jointly administered by the College of Arts and Sciences and the P. C. Rossin College of Engineering and Applied Science, IDEAS is a four-year honors program that allows students to earn a bachelor's degree with concentrations in both colleges. In close collaboration with IDEAS advisors and faculty directors, students admitted to this highly selective honors program develop an individualized academic plan tailored to their interests.

IDEAS allows students to study diverse interests such as bioengineering and religion, computer science and graphic design, industrial engineering and international relations, bioengineering and molecular biology, and music and computer science. Key features of the program include:

- **Rigorous honors program**: Each year, IDEAS accepts 30-40 highly qualified first-year student candidates who have indicated an interest in the program. Students must maintain a 3.25 grade point average to continue.

- **Team-based and individual projects**: Each student builds toward a capstone research project and thesis in their senior year, developed through a combination of team-based and individualized instruction.

- **Communication as key to bridging disciplines**: IDEAS courses are writing-intensive and presentation-oriented. Participation in the program substitutes for some first-year courses in both colleges.

IDEAS graduates are awarded a Bachelor of Science degree, conferred by both colleges. Students interested in pursuing a professionally accredited degree in their selected engineering disciplines may choose to do so in an optional fifth year of study. Some programs of study in the College of Arts and Sciences, mainly in the sciences, may also require further study to complete certification.

**OTHER OPTIONS FOR ENGINEERING STUDENTS**

Cooperative Education (Co-Op)

Co-Op is available for undergraduates in the P. C. Rossin College of Engineering and Applied Science; the program provides eight months of paid, full-time work experience, bridging the gap between engineering theory and application and allowing students to graduate within a four year time-frame. Because of the rigorous academic schedule, the program is selective.

The Co-Op schedule provides for interviews and selection by the sponsoring company in mid-August. This rotation will last until mid-January when the student returns to Lehigh for the second semester coursework of the junior year. The Co-Op experience is completed with a second work rotation the following summer (mid-May through August). Students earn three, free elective credits per successful work assignment for a total of six free elective credits. These six credits are in ENGR 200 (http://catalog.lehigh.edu/coursesprogramsandcurricula/engineeringandappliedscience/engineering/) and are taken as P/F (Pass/Fail).

Technical minors (Available to all students but most require prerequisites from engineering curricula)

<table>
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<tr>
<th>Technical Minor</th>
<th>Department</th>
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<tbody>
<tr>
<td>aerospace engineering</td>
<td>Mechanical Engineering</td>
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<tr>
<td>biotechnology</td>
<td>Chemical Engineering</td>
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<tr>
<td>chemical engineering</td>
<td>Chemical Engineering</td>
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Interdisciplinary Minors (For engineering students)
A minor in Engineering Leadership provides students with knowledge, experiences and interaction with successful business managers in order to become more effective leaders. For more information about this minor: [http://www.lehigh.edu/~inleader/curriculum.html](http://www.lehigh.edu/~inleader/curriculum.html)

The College of Business offers a minor in Business for students in the College of Arts and Sciences and P.C. Rossin College of Engineering and Applied Science to provide students with knowledge and skills to allow them to make informed business decisions. A sequential sequence of courses is designed to integrate such traditional topics as accounting, finance, marketing, and management. For more information about this minor: [http://cbe.lehigh.edu/academics/undergraduate/degree-programs/business-minor](http://cbe.lehigh.edu/academics/undergraduate/degree-programs/business-minor). There is a minor in Real Estate: [http://cbe.lehigh.edu/academics/undergraduate/degree-programs/real-estate-minor](http://cbe.lehigh.edu/academics/undergraduate/degree-programs/real-estate-minor) and a minor in Entrepreneurship: [http://cbe.lehigh.edu/academics/undergraduate/degree-programs/entrepreneurship-minor](http://cbe.lehigh.edu/academics/undergraduate/degree-programs/entrepreneurship-minor). The courses in the latter treat subjects such as intellectual property, creativity and innovation, venture capital, positioning of products and services, and understanding the entrepreneurial mindset. There is also a minor in Supply Chain Management. Details can be found at [http://catalog.lehigh.edu/coursesprogramsandcurricula/businessandeconomics/supplychainmanagement/#undergraduate](http://catalog.lehigh.edu/coursesprogramsandcurricula/businessandeconomics/supplychainmanagement/#undergraduate)

Students in engineering can also earn a minor in various humanities or social sciences by using their humanities and social science electives coupled with their free electives.

Engineering Minor (for non-engineering students)
The College of Engineering enables undergraduate students enrolled in the Colleges of Arts and Sciences and in the College of Business to earn a minor in engineering. This unique program provides students with insight into the world of engineers: who they are, what they do, and how they think. Students pursuing the Engineering Minor develop an understanding of the tools and techniques engineering use on a day-to-day basis.

The mission of the minor is to educate non-engineering students about engineering methodology, specifically how engineers solve problems; how they design, manufacture, and analyze problems; and how other factors such as economics, safety, ethics, and environmental issues affect the engineering design process. Fifteen credit hours of required and elective coursework are required to fulfill the engineering minor. For more information about this minor: [http://www.lehigh.edu/~inengmnr/index.html](http://www.lehigh.edu/~inengmnr/index.html)

Music Option
Music and Engineering is not a major in itself. However, Lehigh attracts many engineering and science students who wish to continue their active involvement in music and the music department. For those students who are interested in pursuing this option, music can be taken as a second degree, minor or through free electives.

Undergraduate research through Centers and Institutes
Faculty and students in the college also have research and scholarship activities in a number of centers and institutes, where graduate and undergraduate students work closely with faculty members.