Computer Engineering - BS, Electrical Engineering Track

The curriculum is designed to cover the engineering aspects of both hardware and software—a total computer systems perspective. All computer engineering students take courses in the following areas: electrical circuits, electronics, digital circuits, computer architecture ranging from microcomputers to mainframes, interfacing, programming languages ranging from assembler to high level, data structures, analysis of algorithms, operating systems, software engineering and microcomputer systems. A solid foundation in the basic sciences of physics, chemistry and mathematics is used to support these courses.

There are two distinct tracks in this curriculum, the Electrical Engineering Track and the Computer Science Track, both culminating in the same Computer Engineering degree. The tracks are substantially similar, each providing a broad coverage of the computer engineering discipline, but each has a slightly different emphasis. Note that students in either track can take courses from the other as electives, or they can use their electives to further specialize within their own track. Although students are required to select a track immediately upon entering the Computer Engineering program, it is usually possible to change tracks as late as the junior year.

The Electrical Engineering track of the Computer Engineering degree places stronger emphasis on digital Very Large Scale Integrated (VLSI) circuits and systems, microprocessor interfacing and system design, and computer system architecture and design. The track is primarily administered by the Department of Electrical and Computer Engineering and is designed to encompass nearly all of the core material of the Electrical Engineering degree but provides much more depth in computing than is possible within the context of an Electrical Engineering degree.

Before commencing course work in the major, students must be admitted to the major or have the approval of the department.

Program Requirements

The freshman year is identical for degrees in aerospace engineering, biomedical engineering, civil engineering, computer engineering, electrical engineering, industrial engineering, mechanical engineering, nuclear engineering, ocean engineering, and petroleum engineering thus allowing a student with adequate grades to change majors within the Dwight Look College of Engineering. The freshman year is slightly different for chemical engineering and radiological health engineering in that students take CHEM 101/111 and CHEM 102/112 instead of CHEM 107/117. Students pursuing degrees in biological and agricultural engineering, computer science, engineering technology, or industrial distribution should refer to the specific curriculum for these majors. It is recognized that many students will change the sequence and number of courses taken in any semester. Deviations from the prescribed course sequence, however, should be made with care to ensure that prerequisites for all courses are met. In addition to the freshman year curriculum listed below, students should refer to the specific curriculum for each major for other requirements. Before commencing course work in the major, students must be admitted to the major or have the approval of the department.

First Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Term Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>ENGL 104</td>
<td>Composition and Rhetoric 1</td>
</tr>
<tr>
<td>ENGR 111</td>
<td>Foundations of Engineering I 1</td>
</tr>
<tr>
<td>MATH 151</td>
<td>Engineering Mathematics I 1 2</td>
</tr>
<tr>
<td>PHYS 218</td>
<td>Mechanics 1</td>
</tr>
<tr>
<td>University Core Curriculum 3</td>
<td></td>
</tr>
<tr>
<td>Total Semester Credit Hours</td>
<td>16</td>
</tr>
</tbody>
</table>

| Spring   |                             |
| CHEM 107 | General Chemistry for Engineering Students 1,4 |
| CHEM 117 | General Chemistry for Engineering Students Laboratory 1 |
| ENGR 112 | Foundations of Engineering II 1 |
| MATH 152 | Engineering Mathematics II 1   |
| PHYS 208 | Electricity and Optics 1       |
| University Core Curriculum 3 |                             |
| Total Semester Credit Hours | 17                           |
| Total Semester Credit Hours: | 33                           |

1 A grade of C or better is required.
2 Entering students will be given a math placement exam. Test results will be used in selecting the appropriate starting course which may be at a higher or lower level.
3 Of the 18 hours shown as University Core Curriculum electives, 3 must be from creative arts, 3 from social and behavioral sciences, 6 from American history, and 6 from government/political science. The required 6 hours from international and cultural diversity may be met by courses satisfying the creative arts, social and behavioral sciences, and American history requirements if they are also on the approved list of international and cultural diversity courses.
4 BMEN, CHEN and RHEN require 8 hours of freshman chemistry, which may be satisfied by CHEM 101/CHEM 111 or CHEM 107/CHEM 117 and CHEM 102/CHEM 112; Credit by Examination (CBE) for CHEM 101/CHEM 111 or CHEM 107/CHEM 117 plus CHEM 102/CHEM 112; or 8 hours of CBE for CHEM 101/CHEM 111 or CHEM 107/CHEM 117 and CHEM 102/CHEM 112.

Second Year

<table>
<thead>
<tr>
<th>Semester</th>
<th>Term Semester Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td></td>
</tr>
<tr>
<td>CSCE 121</td>
<td>Introduction to Program Design and Concepts 1</td>
</tr>
<tr>
<td>CSCE 222/ECEN 222</td>
<td>Discrete Structures for Computing 1</td>
</tr>
<tr>
<td>ECEN 248</td>
<td>Introduction to Digital Systems Design 1</td>
</tr>
<tr>
<td>Total Semester Credit Hours:</td>
<td>33</td>
</tr>
</tbody>
</table>
### Computer Engineering - BS, Electrical Engineering Track

**MATH 251**  
Engineering Mathematics III  

Select one of the following:  

- **ENGL 210**  
  Technical and Business Writing  

- **COMM 205**  
  Communication for Technical Professions  

- **COMM 243**  
  Argumentation and Debate

#### Term Semester Credit Hours  

<table>
<thead>
<tr>
<th>Term</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
</table>
| Spring | CSCE 221 | Data Structures and Algorithms  
  Engineering Mathematics II | 4 |
| | ECEN 214 | Electrical Circuit Theory  
  Engineering Mathematics II | 4 |
| | MATH 308 | Differential Equations  
  Engineering Mathematics II | 3 |
| | STAT 211 | Principles of Statistics I  
  Engineering Mathematics II | 3 |
| | University Core Curriculum | 3 |

#### Total Semester Credit Hours 17

### Third Year

**Fall**

- **CSCE 313**  
  Introduction to Computer Systems  

- **CSCE 481**  
  Seminar  

- **ECEN 314**  
  Signals and Systems  

- **ECEN 350/CSCE 350**  
  Computer Architecture and Design  

- **University Core Curriculum**  
  3

#### Term Semester Credit Hours 17

<table>
<thead>
<tr>
<th>Term</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
</table>
| Fall | CSCE 313 | Introduction to Computer Systems  
  Engineering Mathematics II | 4 |
| | CSCE 481 | Seminar  
  Engineering Mathematics II | 1 |
| | ECEN 314 | Signals and Systems  
  Engineering Mathematics II | 3 |
| | ECEN 350/CSCE 350 | Computer Architecture and Design  
  Engineering Mathematics II | 4 |
| | University Core Curriculum | 3 |

#### Total Semester Credit Hours 15

**Spring**

- **CSCE 315**  
  Programming Studio  

- **ECEN 325**  
  Electronics  

- **ECEN 449**  
  Microprocessor Systems Design  

- **ECEN 454**  
  Digital Integrated Circuit Design  

- **MATH 311**  
  Topics in Applied Mathematics I

#### Term Semester Credit Hours 16

<table>
<thead>
<tr>
<th>Term</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
</table>
| Spring | CSCE 315 | Programming Studio  
  Engineering Mathematics II | 3 |
| | ECEN 325 | Electronics  
  Engineering Mathematics II | 4 |
| | ECEN 449 | Microprocessor Systems Design  
  Engineering Mathematics II | 3 |
| | ECEN 454 | Digital Integrated Circuit Design  
  Engineering Mathematics II | 3 |
| | MATH 311 | Topics in Applied Mathematics I  
  Engineering Mathematics II | 3 |

#### Total Semester Credit Hours 15

### Fourth Year

**Fall**

- **ECEN 403**  
  Electrical Design Laboratory I  

- **ENGR 482/PHIL 482**  
  Ethics and Engineering  

- **Area elective**  
  6

- **ENGR elective**  
  3

#### Term Semester Credit Hours 15

<table>
<thead>
<tr>
<th>Term</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
</table>
| Fall | ECEN 403 | Electrical Design Laboratory I  
  Engineering Mathematics II | 3 |
| | ENGR 482/PHIL 482 | Ethics and Engineering  
  Engineering Mathematics II | 3 |
| | Area elective | 6 |
| | ENGR elective | 3 |

#### Total Semester Credit Hours 15

**Spring**

- **ECEN 404**  
  Electrical Design Laboratory II  

- **Area elective**  
  6

- **University Core Curriculum**  
  6

#### Term Semester Credit Hours 15

<table>
<thead>
<tr>
<th>Term</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Semester Credit Hours</th>
</tr>
</thead>
</table>
| Spring | ECEN 404 | Electrical Design Laboratory II  
  Engineering Mathematics II | 3 |
| | Area elective | 6 |
| | University Core Curriculum | 6 |

#### Total Semester Credit Hours 15

#### Total Program Hours 128

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5 Students intending to specialize in Communications are encouraged to take ECEN 303.

6 Fulfills the University Core Curriculum requirement for Language, Philosophy and Culture.

7 See advising office for a listing of approved electives.