# REQUIRED COURSES WITHIN THE ENGINEERING COLLEGE (75 hrs)

## CE+EE Core Courses (34 hrs)

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Number</th>
<th>Off. Hrs.</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Orientation*a</td>
<td>ENGR 100</td>
<td>0</td>
<td>Admission to the College of Engineering</td>
</tr>
<tr>
<td>Introduction to Computing and Programming</td>
<td>CS 107</td>
<td>4</td>
<td>Credit or concurrent registration in MATH 180</td>
</tr>
<tr>
<td>Introduction to Electrical and Computer Engineering</td>
<td>ECE 115</td>
<td>4</td>
<td>Credit or concurrent registration in MATH 180; or Grade C or better in MATH 165</td>
</tr>
<tr>
<td>Circuit Analysis</td>
<td>ECE 225</td>
<td>4</td>
<td>Credit or concurrent reg. in MATH 220; and C or better in ECE 115 and PHYS 142</td>
</tr>
<tr>
<td>Introduction to Logic Design</td>
<td>ECE 265</td>
<td>4</td>
<td>MATH 180; and C or better in ECE 115</td>
</tr>
<tr>
<td>Introduction to Embedded Systems</td>
<td>ECE 266</td>
<td>4</td>
<td>CS 107; and credit or concurrent registration in ECE 265</td>
</tr>
<tr>
<td>Discrete and Continuous Signals and Systems</td>
<td>ECE 310</td>
<td>3</td>
<td>MATH 220; and credit or concurrent reg. in ECE 225 (ECE 210* for non-ECE students)</td>
</tr>
<tr>
<td>Electronics I</td>
<td>ECE 340</td>
<td>4</td>
<td>Grade of C or better in ECE 225</td>
</tr>
<tr>
<td>Probability &amp; Random Processes for Engineers</td>
<td>ECE 341</td>
<td>3</td>
<td>Grade of C or better in MATH 210</td>
</tr>
<tr>
<td>Senior Design I</td>
<td>ECE 396</td>
<td>0</td>
<td>ENGL 161; and senior standing</td>
</tr>
<tr>
<td>Senior Design II</td>
<td>ECE 397</td>
<td>0</td>
<td>ECE 396</td>
</tr>
<tr>
<td>Professional Development Seminar</td>
<td>ECE 499</td>
<td>0</td>
<td>Open only to seniors; and approval of the dept. Must be taken in the student’s last semester of study.</td>
</tr>
</tbody>
</table>

## CE-only Core Courses (24 hrs)

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Number</th>
<th>Off. Hrs.</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematical Foundations of Computing</td>
<td>CS 151</td>
<td>3</td>
<td>MATH 180; and Grade of C or better in CS 111.</td>
</tr>
<tr>
<td>Data Structures</td>
<td>CS 251</td>
<td>4</td>
<td>Grade of C or better in CS 141; and Grade of C or better in CS 151; and Credit or concurrent registration in CS 211.</td>
</tr>
<tr>
<td>Computer Communication Networks I</td>
<td>ECE 333</td>
<td>4</td>
<td>CS 107; and ECE 341</td>
</tr>
<tr>
<td>Computer Organization</td>
<td>ECE 366</td>
<td>3</td>
<td>ECE 266; and credit or concurrent registration in CS 251</td>
</tr>
<tr>
<td>Digital Systems Design</td>
<td>ECE 465</td>
<td>3</td>
<td>Grade C or better in PHYS 142; and ECE 366.</td>
</tr>
<tr>
<td>Computer Architecture</td>
<td>ECE 466</td>
<td>3</td>
<td>ECE 366 or CS 261</td>
</tr>
<tr>
<td>Introduction to VLSI Design</td>
<td>ECE 467</td>
<td>4</td>
<td>ECE 340</td>
</tr>
</tbody>
</table>

## CE Technical Electives (17 hrs)

No more than a total of two courses below the 400 level can be used to meet the technical electives requirement. Also, at most one course from outside the Electrical and Engineering Department and the Computer Science Department may be used to meet the technical elective requirement.

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Number</th>
<th>Off. Hrs.</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Analog and Digital Communications</td>
<td>ECE 311</td>
<td>4</td>
<td>Grade of C or better in ECE 310; and grade of C or better in ECE 341</td>
</tr>
<tr>
<td>Digital Signal Processing</td>
<td>ECE 317</td>
<td>4</td>
<td>Grade of C or better in ECE 310</td>
</tr>
<tr>
<td>Introduction to Electromagnetics and Applications</td>
<td>ECE 322</td>
<td>4</td>
<td>ECE 225</td>
</tr>
<tr>
<td>Electronics II</td>
<td>ECE 342</td>
<td>4</td>
<td>ECE 340</td>
</tr>
<tr>
<td>Solid-State Device Theory</td>
<td>ECE 346</td>
<td>4</td>
<td>MATH 220; grade of C or better in ECE 115, and a grade of C or better in PHYS 142</td>
</tr>
<tr>
<td>Integrated Circuit Engineering</td>
<td>ECE 347</td>
<td>4</td>
<td>CHEM 122/123 and grade of C or better in ECE 225</td>
</tr>
<tr>
<td>Principles of Automatic Control</td>
<td>ECE 350</td>
<td>4</td>
<td>MATH 310 and gr. of C or better in ECE 310</td>
</tr>
<tr>
<td>Pattern Recognition I</td>
<td>ECE 407</td>
<td>3</td>
<td>ECE 341</td>
</tr>
<tr>
<td>Network Analysis</td>
<td>ECE 410</td>
<td>3</td>
<td>MATH 310 and gr. of C or better in ECE 310</td>
</tr>
<tr>
<td>Introduction to Filter Synthesis</td>
<td>ECE 412</td>
<td>3</td>
<td>Grade of C or better in ECE 310</td>
</tr>
<tr>
<td>Image Analysis and Computer Vision I</td>
<td>ECE 415</td>
<td>3</td>
<td>MATH 310; or grade of C or better in ECE 310</td>
</tr>
<tr>
<td>Digital Signal Processing II</td>
<td>ECE 417</td>
<td>4</td>
<td>ECE 317</td>
</tr>
<tr>
<td>Statistical Digital Signal Processing</td>
<td>ECE 418</td>
<td>3</td>
<td>ECE 317 and ECE 341</td>
</tr>
<tr>
<td>Introduction to Antennas and Wireless Propagation</td>
<td>ECE 421</td>
<td>3</td>
<td>ECE 225 and ECE 322</td>
</tr>
<tr>
<td>Electromagnetic Compatibility</td>
<td>ECE 423</td>
<td>4</td>
<td>Math 310 and ECE 322</td>
</tr>
<tr>
<td>RF and Microwave Guided Propagation</td>
<td>ECE 424</td>
<td>4</td>
<td>ECE 225 and ECE 322</td>
</tr>
<tr>
<td>Modern Linear Optics</td>
<td>ECE 427</td>
<td>3</td>
<td>ECE 310 and ECE 322</td>
</tr>
<tr>
<td>Analog Communication Circuits</td>
<td>ECE 431</td>
<td>4</td>
<td>ECE 311 and ECE 340</td>
</tr>
<tr>
<td>Digital Communications</td>
<td>ECE 432</td>
<td>3</td>
<td>MATH 310, ECE 311 and ECE 341</td>
</tr>
<tr>
<td>Multimedia Systems</td>
<td>ECE 434</td>
<td>3</td>
<td>ECE 310</td>
</tr>
</tbody>
</table>
Technical Electives Continued

- Computer Communication Networks II
  - ECE 436  Sp  3
  - ECE 333
- Wireless Communications
  - ECE 437  Sp  3
  - ECE 311 and ECE 341
- Nanoelectronics
  - ECE 440  F  3
  - ECE 346; or consent of the instructor
- Power Semiconductor Devices & Integ. Circuits
  - ECE 442  Sp  4
  - ECE 346
- Analysis & Design of Power Electronic Circuits
  - ECE 445  F  4
  - ECE 342
- Transistors
  - ECE 446  Sp  3
  - ECE 346
- Microdevices and Micromachining Technology
  - ECE 449  Sp  4
  - ECE 347; or consent of the instructor
- Control Engineering
  - ECE 451  F  3
  - ECE 350 and grade C or better in Math 310
- Robotics: Algorithms and Control
  - ECE 452  Sp  3
  - Grade of C or better in ECE 310; and MATH 310
- Mechatronic and Embedded Systems Design**
  - ECE 454  Sp  4
  - ECE 340, ECE 266 and ECE 310; or consent of the Instructor
- Electromechanical Energy Conversion
  - ECE 458  F  3
  - Grade of C or better in ECE 225
- Testing and Reliability**
  - ECE 464  F  3
  - CS 251; and ECE 265
- Analog and Mixed-Signal Integrated Circuits
  - ECE 468  Sp  4
  - ECE 342
- Hardware Descrip Language Modeling & Datapath Design
  - ECE 469  Sp  4
  - ECE 366; and ECE 465

Seminar- Special Topics
  - ECE 491  F,SP  4
  - **Most ECE 491 special topics course (NOT ECE 322 without lab) would be ECE Technical Electives, but those still need a Request for Modification of Major form.

Computer Systems
  - CS 361  3
  - CS 251 and ECE 266 or CS 261

Computer Algorithms I
  - CS 401  3
  - Grade of C or better in CS 251

Fundamentals of Modern Quantum Theory
  - PHYS 240  3
  - C or better in MATH 181; and C or better in PHYS 142 or B or better in PHYS 107

Coding and Cryptography
  - MCS 425  3
  - Gr. of C or bett. in MATH 215; &Gr. of C or bett. in MATH 310 or Gr. of C or bett. in MATH 320; or consent of the instr.

Numerical Analysis
  - MCS 471  3
  - Gr. of C or bett. in MCS 275 or Gr of C or bett. in CS 102 or Gr. of C or bett. in CS 108 or consent of instructor.

Linear and Non-Linear Programming
  - STAT 471  3
  - Grade of C or better in MATH 310

NONENGINEERING AND GENERAL EDUCATION REQUIREMENTS (53 hrs)

General Chemistry I Lecture\(c\)
  - CHEM 122  4
  - Grade of C or better in CHEM 101 or adequate performance on the UIC Chemistry placement examination; and concurrent registration or Grade C or better in CHEM 123

General Chemistry I Laboratory\(b, c\)
  - CHEM 123  1
  - Gr. of C or better in CHEM 101; & concurrent registration or Gr. of C or better in CHEM 122

Academic Writing I:WAPC
  - ENGL 160  3
  - Performance on Dept. Placement Test

Academic Writing II:WIR
  - ENGL 161  3
  - ENGL 160 or the equivalent

Exploring World Cultures course\(a\)
  - 3

Understanding the Creative Arts course\(a\)
  - 3

Understanding the Past course\(a\)
  - 3

Understanding the Individual and Society course\(a\)
  - 3

Understanding US Society course\(a\)
  - 3

Calculus I\(b\)
  - MATH 180  4
  - C or better in MATH 121 or app. perf. on the dept. pl. test

Calculus II\(b\)
  - MATH 181  4
  - C or better in MATH 180

Calculus III\(b\)
  - MATH 210  4
  - C or better in MATH 181

Introduction to Differential Equations I
  - MATH 220  3
  - C or better in MATH 210

Applied Linear Algebra
  - MATH 310  3
  - C or better in MATH 181

General Physics I (Mechanics)\(b\)
  - PHYS 141  4
  - C or better or concurrent registration in MATH 180; or approval of the dept; and C or better in PHYS 100 or adequate performance on the departmental placement test

General Physics II (Electricity and Magnetism)\(b\)
  - PHYS 142  4
  - Grade of C or better in PHYS 141; and grade of C or better or concurrent registration in MATH 181

Introduction to Thermal Physics
  - PHYS 260  2
  - Grade of C or better in PHYS 141 and Grade of C or better in MATH 181

\(a\)-Students should consult General Education section of the catalog for approved courses in this category; \(b\)-Course approved for the Analyzing the Natural World General Education category; \(c\)-General Education credit is given for successful completion of both CHEM 122 and CHEM 123.

**May be approved as a Technical Elective with a Request for Modification of Major form.