### ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT

**Electrical Engineering Major**  
(128 Semester Hours)  
11/6/2014

#### REQUIRED COURSES WITHIN THE ENGINEERING COLLEGE

<table>
<thead>
<tr>
<th>COURSE TITLE</th>
<th>NUMBER</th>
<th>OFF. HRS</th>
<th>PREREQUISITES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical Engineering Core Courses (43 hrs)</strong></td>
<td></td>
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</tr>
<tr>
<td>Orientation*a</td>
<td>ENGR 100</td>
<td>0</td>
<td>Admission to the College of Engineering</td>
</tr>
<tr>
<td>Introduction to Thermodynamics*</td>
<td>CHE 201 or ME 205</td>
<td>3</td>
<td>MATH 181 and PHYS 141</td>
</tr>
<tr>
<td>Introduction to Thermodynamics</td>
<td>ECE 115</td>
<td>F,Sp 4</td>
<td>Credit or concurrent registration in MATH 180</td>
</tr>
<tr>
<td>Introduction to Computing and Programming</td>
<td>CS 107</td>
<td>4</td>
<td>MATH 181 and PHYS 141</td>
</tr>
<tr>
<td>Introduction to Electrical and Computer Eng.</td>
<td>ECE 225</td>
<td>F,Sp 4</td>
<td>MATH 180; &amp; grade of C or better in ECE 115</td>
</tr>
<tr>
<td>Circuit Analysis</td>
<td>ECE 265</td>
<td>F,Sp 4</td>
<td>MATH 180; and grade of C or better in ECE 115</td>
</tr>
<tr>
<td>Computer Organization I</td>
<td>ECE 267</td>
<td>F,Sp 3</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>F,Sp 3</td>
<td>MATH 180; &amp; cr. or conc. reg. in ECE 225, or cr. or conc. reg. in ECE 210</td>
</tr>
<tr>
<td>Communication Electromagnetics</td>
<td>ECE 322</td>
<td>F,Sp 3</td>
<td>Grade of C or better in ECE 225</td>
</tr>
<tr>
<td>Electronics I</td>
<td>ECE 340</td>
<td>F,Sp 4</td>
<td>Grade of C or better in ECE 225</td>
</tr>
<tr>
<td>Probability and Random Processes for Engineers</td>
<td>ECE 341</td>
<td>F,Sp 3</td>
<td>Credit or concurrent registration in ECE 310</td>
</tr>
<tr>
<td>Solid-State Device Theory</td>
<td>ECE 346</td>
<td>F,Sp 4</td>
<td>MATH 180, gr. of C or better in ECE 142, and a gr. of C or better in PHYS 142</td>
</tr>
<tr>
<td>Senior Design I</td>
<td>ECE 396</td>
<td>F,Sp 2</td>
<td>ENGL 161 and senior standing</td>
</tr>
<tr>
<td>Senior Design II</td>
<td>ECE 397</td>
<td>F,Sp 2</td>
<td>ECE 396</td>
</tr>
<tr>
<td>Professional Development Seminar</td>
<td>ECE 499</td>
<td>F,Sp 0</td>
<td>Open only to seniors; &amp; approval of the dept. Must be taken in the student's last semester of study.</td>
</tr>
<tr>
<td><strong>Electrical Engineering Advanced Core Courses (12 hrs)</strong></td>
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<tr>
<td>(Students must complete at least three of the following courses.)</td>
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<tr>
<td>Communication Engineering</td>
<td>ECE 311</td>
<td>F,Sp 4</td>
<td>Grade of C or better in ECE 310</td>
</tr>
<tr>
<td>Digital Signal Processing I</td>
<td>ECE 317</td>
<td>F,Sp 4</td>
<td>Grade of C or better in ECE 310</td>
</tr>
<tr>
<td>Electronics II</td>
<td>ECE 342</td>
<td>F,Sp 4</td>
<td>ECE 340</td>
</tr>
<tr>
<td>Principles of Automatic Control</td>
<td>ECE 350</td>
<td>F,Sp 4</td>
<td>Math 310 and gr. of C or better in ECE 310</td>
</tr>
<tr>
<td>Microprocessor-Based Design</td>
<td>ECE 367</td>
<td>F,Sp 4</td>
<td>ECE 267; and gr. of C or better in ECE 265; or gr. of C or better in CS 366</td>
</tr>
<tr>
<td>RF and Microwave Guided Propagation</td>
<td>ECE 424</td>
<td>F</td>
<td>ECE 225 and ECE 322</td>
</tr>
<tr>
<td><strong>Technical Electives (17 hrs)</strong></td>
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<tr>
<td>(Those courses not used to meet the advanced EE core requirement can be used as technical electives. However, no more than a total of two courses below the 400 level can be used to meet the technical electives requirement. Also, no more than one course from outside the ECE Department can be used to meet the technical electives requirement.)</td>
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<tr>
<td>General PHYS III (Modern PHYS)</td>
<td>PHYS 244</td>
<td>3</td>
<td>C or better in PHYS 107 or C or better in PHYS 108; or C or better in PHYS 142</td>
</tr>
<tr>
<td>Computer Communication Networks I</td>
<td>ECE 333</td>
<td>F</td>
<td>ECE 341 and CS 201</td>
</tr>
<tr>
<td>Integrated Circuit Engineering</td>
<td>ECE 347</td>
<td>F,Sp 3</td>
<td>CHEM 112 and grade of C or better in ECE 225</td>
</tr>
<tr>
<td>Computer Organization II</td>
<td>ECE 366</td>
<td>F,Sp 4</td>
<td>ECE 267 and CS 201</td>
</tr>
<tr>
<td>CAD-Based Digital Design</td>
<td>ECE 368</td>
<td>Sp 4</td>
<td>ECE 366</td>
</tr>
<tr>
<td>Operating Systems Concepts and Design*a</td>
<td>CS 385</td>
<td>3</td>
<td>CS 361 or CS 201 &amp; ECE 367</td>
</tr>
<tr>
<td>Quasi-Static Electric and Magnetic Fields</td>
<td>ECE 401</td>
<td>Sp 3</td>
<td>ECE 322</td>
</tr>
<tr>
<td>Pattern Recognition I</td>
<td>ECE 407</td>
<td>Sp 3</td>
<td>MATH 220</td>
</tr>
<tr>
<td>Network Analysis</td>
<td>ECE 410</td>
<td>F</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>Sp 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>F</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>F</td>
<td>ECE 317</td>
</tr>
<tr>
<td>Statistical Digital Signal Processing</td>
<td>ECE 418</td>
<td>Sp 3</td>
<td>ECE 317 and 341</td>
</tr>
<tr>
<td>Introduction to Antennas and Wireless Propagation</td>
<td>ECE 421</td>
<td>F</td>
<td>ECE 225 and ECE 322</td>
</tr>
<tr>
<td>Electromagnetic Compatibility</td>
<td>ECE 423</td>
<td>Sp 3</td>
<td>Math 310 and ECE 322</td>
</tr>
<tr>
<td>Modern Linear Optics</td>
<td>ECE 427</td>
<td>F</td>
<td>ECE 310 and ECE 322</td>
</tr>
<tr>
<td>Analog Communication Circuits</td>
<td>ECE 431</td>
<td>F</td>
<td>ECE 311 and ECE 340</td>
</tr>
<tr>
<td>Digital Communications</td>
<td>ECE 432</td>
<td>F</td>
<td>Math 310, ECE 311 and ECE 341</td>
</tr>
</tbody>
</table>

**TECHNICAL ELECTIVES CONTINUED**
## TECHNICAL ELECTIVES CONTINUED

Multimedia Systems
- **ECE 434** (F, 3 hrs) ECE 310

Computer Communication Networks II
- **ECE 436** (Sp, 3 hrs) ECE 333

Wireless Communications
- **ECE 437** (F, 3 hrs) ECE 311 and ECE 341

Nanoelectronics
- **ECE 440** (F, 3 hrs) ECE 346; or consent of the instructor

Power Semiconductor Devices & Integ. Circuits
- **ECE 442** (Sp, 4 hrs) ECE 342 and ECE 346

Analysis & Design of Power Electronic Circuits
- **ECE 445** (F, 4 hrs) ECE 342; and grade of C or better in ECE 310

Transistors
- **ECE 448** (Sp, 3 hrs) ECE 346

Microdevices and Micromachining Technology
- **ECE 449** (Sp, 4 hrs) ECE 347; or consent of the instructor

Control Engineering
- **ECE 451** (F, 3 hrs) ECE 350

Robotics: Algorithms and Control
- **ECE 452** (Sp, 3 hrs) CS 201; & grade of C or better in ECE 210 or CS 225

Electromechanical Energy Conversion
- **ECE 455** (F, 3 hrs) Grade of C or better in ECE 225

Advanced Computer Architecture
- **ECE 466** (F, 4 hrs) Grade of C or better in ECE 265 or ECE 366

Introduction to VLSI Design
- **ECE 467** (F, 4 hrs) ECE 340

Analog and Mixed-Signal VLSI Design
- **ECE 468** (Sp, 4 hrs) ECE 467

Computer Systems Design
- **ECE 469** (Sp, 3 hrs) Grade of C or better in ECE 346 and ECE 368

Coding and Cryptography
- **MCS 425** (Sp, 3 hrs) Grade of C or better in MATH 215; or Grade of C or better in MATH 310

NONENGINEERING AND GENERAL EDUCATION REQUIREMENTS (50 hrs)

### COURSE TITLE
- General College Chemistry I*#b
- **Chem 112** (5 hrs) C or better in CHEM 101 or adequate performance on the UIC chemistry placement exam

- Academic Writing I:WAPC
- **ENGL 160** (3 hrs) Performance on Dept. Placement Test

- Academic Writing II:WIR
- **ENGL 161** (3 hrs) ENGL 160 or the equivalent

- Exploring World Cultures course*a
- **3 hrs**

- Understanding the Creative Arts course*a
- **3 hrs**

- Understanding the Past course*a
- **3 hrs**

- Understanding the Individual and Society course*a
- **3 hrs**

- Understanding US Society course*a
- **3 hrs**

- Calculus I*#b
- **MATH 180** (5 hrs) C or better in MATH 121 or app. perf. on the dept. pl. test

- Calculus II*#b
- **MATH 181** (5 hrs) C or better in MATH 180

- Calculus III*#b
- **MATH 210** (3 hrs) C or better in MATH 181

- Introduction to Differential Equations I
- **MATH 220** (3 hrs) C or better in MATH 210

- General Physics I (Mechanics)*#b
- **PHYS 141** (4 hrs) Gr. of C. or better in MATH 180

- General Physics II (Electricity & Magnetism)*#b
- **PHYS 142** (4 hrs) Gr. of C or better in MATH 181 & Gr. of C or better in PHYS 141 or consent of the instructor

*a-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

### Additional Mathematics Requirement
(Students must complete at least one of the following courses.)

- Applied Linear Algebra
- **MATH 310** (3 hrs) "C" or better in MATH 210

- Advanced Calculus I
- **MATH 410** (3 hrs) "C" or better in MATH 210

- Complex Analysis with Applications
- **MATH 417** (3 hrs) "C" or better in MATH 210

- Applied Partial Differential Equations
- **MATH 481** (3 hrs) "C" or better in MATH 220

- Numerical Analysis
- **MCS 471** (3 hrs) Gr. of C or better in MCS 275 or Gr of C or better in CS 102 or Gr. of C or better in CS 108 or consent of instructor.

### FREE ELECTIVES (3 hrs)

Students must select* courses from outside the ECE Department.

*a-Students preparing for the Fundamentals of Engineering Examination, which leads to becoming a Licensed Professional Engineer, are advised to use these hours to take the course CME 201, Statics; and one course from the following courses: CME 203, Strength of Materials; CME 260, Properties of Materials; ME 211, Fluid Mechanics I."
UIC Electrical Engineering Curriculum - Suggested Schedule of Courses

Year 1
Sem 1 (17 hours)
CHEM 112 (5)
ECE 115 (4)
MATH 180 (5)
ENGL 160 (3)
ENGR 100 (0)

Year 1
Sem 2 (16 hours)
CS 107 (4)
PHYS 141 (4)
MATH 181 (5)
ENGL 161 (3)

Year 2
Sem 1 (17 hours)
ECE 267 (3)
PHYS 142 (4)
MATH 210 (3)
Gen. Ed. Elective (3)
Gen. Ed. Elective (3)

Year 2
Sem 2 (15 hours)
ECE 265 (4)
MATH 220 (3)
CHE 201 or ME 205 (3)
Gen. Ed. Elective (3)
Gen. Ed. Elective (3)

Year 3
Sem 1 (17 hours)
ECE 310 (3)
ECE 346 (4)
Math* Elective (3)
Gen. Ed. Elective (3)
Gen. Ed. Elective (3)

Year 3
Sem 2 (17 hours)
ECE 317 (4), 350 (4), 367 (4), 424 (4)
EE Advanced Core (4)
EE Advanced Core (4)
EE Advanced Core (4)

Year 4
Sem 1 (16-18 hours)
ECE 341 (3)
EE Tech. Elective (3-4)
EE Tech. Elective (3-4)
EE Tech. Elective (3-4)

Year 4
Sem 2 (11-14 hours)
EE Tech. Elective (3-4)
EE Tech. Elective (3-4)
EE Tech. Elective (3-4)
EE Tech. Elective (3-4)

Legend:

- Prerequisite course
- Grade \( \geq C \) required in prerequisite
- Co-requisite course

*Select one course from: MATH 310, 410, 417, 481 & MCS 471

EE Advanced Core Courses:
ECE 311 (4), 317 (4), 342 (4), 350 (4), 367 (4), 424 (4)
(Must take at least three courses from this group)