ELECTRICAL ENGINEERING, B.S.

Electrical engineers design, develop, analyze, research, and manufacture systems such as those for power generation distribution, communication, control, and instrumentation. Electrical engineers are also concerned with the devices that make up these systems, such as transistors, integrated circuits, rotating machines, antennas, and fusion plasma confinement devices. Low-power, reliable integrated circuits allow dramatic improvements that have driven the revolution in communications and computation. High-power transistors in combination with electronic controls are serving as the foundation for new ways of efficiently utilizing electrical power.

ELECTRICAL ENGINEERING AND COMPUTER
ENGINEERING PROGRAM EDUCATIONAL OBJECTIVES

Our graduates should be engaged in activities such as:

1. Employment in industry, government, academia, or nonprofit using their degree knowledge or skills for professional functions such as teaching, research and development, quality control, technical marketing, intellectual property management, or sales. Graduates may eventually reach a leadership position supervising others.
2. Continuing education through self-study or short courses and workshops through their employer, local or online educational institutions, or attendance at professional events such as conferences.
3. Taking a principal role in starting a new business or product line.
4. Pursuing a postgraduate degree.

ADMISSION TO THE COLLEGE AS A FRESHMAN

Students applying to UW–Madison (https://www.admissions.wisc.edu/apply) need to indicate an engineering major (https://www.engr.wisc.edu/academics/undergraduate-academics/choosing-a-major) as their first choice in order to be considered for direct admission to the College of Engineering. Direct admission to a major means students will start in the program of their choice in the College of Engineering and will need to meet progression requirements (https://www.engr.wisc.edu/academics/student-services/academic-advising/first-year-undergraduate-students/progression-requirements) at the end of the first year to guarantee advancement in that program.

CROSS-CAMPUS TRANSFER TO ENGINEERING

UW–Madison students in other schools and colleges on campus must meet the course and credit requirements for admission to engineering degree granting classifications specified in the general college requirements (https://www.engr.wisc.edu/academics/student-services/academic-advising/cross-campus-students). The requirements are the minimum for admission consideration. Cross-campus admission is competitive and selective, and the grade point average expectations may increase as demand trends change. The student’s overall academic record at UW–Madison is also considered. Students apply to their intended engineering program by submitting the online application by stated deadlines for spring and fall. The College of Engineering offers group information sessions (https://www.engr.wisc.edu/academics/

student-services/academic-advising/cross-campus-students) for students to learn about the cross-campus transfer process.

OFF-CAMPUS TRANSFER TO ENGINEERING

With careful planning, students at other accredited institutions can transfer coursework that will apply toward engineering degree requirements at UW–Madison. Off-campus transfer applicants are considered for direct admission to the College of Engineering by applying to the Office of Admissions with an engineering major listed as their first choice. Those who are admitted to their intended engineering program must meet progression requirements (https://www.engr.wisc.edu/academics/student-services/academic-advising/transfer-students) at the point of transfer or within their first two semesters at UW–Madison to guarantee advancement in that program. A minimum of 30 credits in residence in the College of Engineering is required after transferring, and all students must meet all requirements for their major in the college. Transfer admission to the College of Engineering is competitive and selective, and students who have earned more than 80 transferable semester credits at the time of application are not eligible to apply.

The College of Engineering has dual degree programs with select four-year UW System campuses. Eligible dual degree applicants are not subject to the 80 credit limit.

Off-campus transfer students are encouraged to discuss their interests, academic background, and admission options with the Transfer Coordinator in the College of Engineering: ugtransfer@engr.wisc.edu or 608-262-2473.

SECOND BACHELOR'S DEGREE

The College of Engineering does not accept second undergraduate degree applications. Second degree students (https://www.engr.wisc.edu/admissions/undergraduate-admissions/returning-adults-second-degree-students) might explore the Biological Systems Engineering program at UW–Madison, an undergraduate engineering degree elsewhere, or a graduate program in the College of Engineering.

REQUIREMENTS

UNIVERSITY GENERAL EDUCATION
REQUIREMENTS

All undergraduate students at the University of Wisconsin–Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (http://guide.wisc.edu/undergraduate/#requirementsforundergraduatestudents) section of the Guide.
Electrical Engineering, B.S.

General Education
- Breadth— Humanities/Literature/Arts: 6 credits
- Breadth—Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits
- Breadth—Social Studies: 3 credits
- Communication Part A & Part B *
- Ethnic Studies *
- Quantitative Reasoning Part A & Part B *

* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

The following curriculum applies to students who were admitted to the electrical engineering degree program (classification changed to EE) in Fall 2017 or later.

SUMMARY OF REQUIREMENTS

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math 221</td>
<td>Calculus and Analytic Geometry 1</td>
<td>5</td>
</tr>
<tr>
<td>or Math 217</td>
<td>Calculus with Algebra and Trigonometry 2</td>
<td></td>
</tr>
<tr>
<td>or Math 275</td>
<td>Topics in Calculus I</td>
<td></td>
</tr>
<tr>
<td>Math 222</td>
<td>Calculus and Analytic Geometry 2</td>
<td>4</td>
</tr>
<tr>
<td>or Math 276</td>
<td>Topics in Calculus II</td>
<td></td>
</tr>
<tr>
<td>Math 234</td>
<td>Calculus—Functions of Several Variables 1</td>
<td>4</td>
</tr>
<tr>
<td>Probability and Statistics Elective</td>
<td>Introduction to Theory and Methods of Mathematical Statistics I</td>
<td>3</td>
</tr>
<tr>
<td>STAT 311</td>
<td>Statistical Experimental Design</td>
<td></td>
</tr>
<tr>
<td>Math/Stat 424</td>
<td>Introduction to the Theory of Probability</td>
<td></td>
</tr>
<tr>
<td>Math/Stat 431</td>
<td>Introduction to Random Signal Analysis and Statistics</td>
<td></td>
</tr>
<tr>
<td>Total Credits</td>
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<td>16</td>
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</table>

SCIENCE

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Comp Sci 300</td>
<td>Programming II</td>
<td>3</td>
</tr>
<tr>
<td>Physics 201</td>
<td>General Physics</td>
<td>5</td>
</tr>
<tr>
<td>or Physics 207</td>
<td>General Physics</td>
<td></td>
</tr>
<tr>
<td>or Physics 247</td>
<td>A Modern Introduction to Physics</td>
<td></td>
</tr>
<tr>
<td>Physics 202</td>
<td>General Physics</td>
<td>5</td>
</tr>
<tr>
<td>or Physics 208</td>
<td>General Physics</td>
<td></td>
</tr>
<tr>
<td>or Physics 248</td>
<td>A Modern Introduction to Physics</td>
<td></td>
</tr>
</tbody>
</table>

Select one of the following: 5-9
- Chem 109 | Advanced General Chemistry  |
- Chem 103 | General Chemistry I  |
- & Chem 104 | General Chemistry II |

Total Credits 18-22

1 Students may also fulfill this requirement by taking E M A 201 Statics and E M A 202 Dynamics or E M A 201 Statics and M E 240 Dynamics.

ELECTRICAL ENGINEERING CORE

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>E C E 203</td>
<td>Signals, Information, and Computation</td>
<td>3</td>
</tr>
<tr>
<td>E C E 210</td>
<td>Introductory Experience in Electrical Engineering</td>
<td>2</td>
</tr>
<tr>
<td>E C E 219</td>
<td>Analytical Methods for Electromagnetics Engineering</td>
<td>1</td>
</tr>
<tr>
<td>E C E 220</td>
<td>Electrodynamics I</td>
<td>3</td>
</tr>
<tr>
<td>E C E 230</td>
<td>Circuit Analysis</td>
<td>4</td>
</tr>
<tr>
<td>E C E/Physics 235</td>
<td>Introduction to Solid State Electronics</td>
<td>3</td>
</tr>
<tr>
<td>E C E/Comp Sci 252</td>
<td>Introduction to Computer Engineering</td>
<td>2</td>
</tr>
<tr>
<td>E C E 270</td>
<td>Circuits Laboratory I</td>
<td>1</td>
</tr>
<tr>
<td>E C E 271</td>
<td>Circuits Laboratory II</td>
<td>1</td>
</tr>
<tr>
<td>E C E 330</td>
<td>Signals and Systems</td>
<td>3</td>
</tr>
<tr>
<td>E C E 340</td>
<td>Electronic Circuits I</td>
<td>3</td>
</tr>
<tr>
<td>E C E/Comp Sci 352</td>
<td>Digital System Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>E C E 370</td>
<td>Advanced Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>Total Credits</td>
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<td>31</td>
</tr>
</tbody>
</table>

ELECTRICAL ENGINEERING ADVANCED ELECTIVES

Students must take 22 credits in at least three of six areas and at least 2 credits in two laboratory courses.

- At least 9 credits must be in courses numbered 400 and above.
- At least one course must be a capstone design course.
- Students can count 1 credit of E C E 1 Cooperative Education Program toward advanced electives.
- Students can count up to 6 credits of E C E 399 Independent Study, E C E 489 Honors in Research or E C E 699 Advanced Independent Study towards advanced electives.
- Students can take E C E 379 Special Topics in Electrical and Computer Engineering and E C E 601 Special Topics in Electrical and Computer Engineering as advanced electives.

Laboratory

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select at least one course from E C E 301 to E C E 317</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 MATH 375 and MATH 376 taken in sequence will fulfill the requirement for MATH 234.
An additional laboratory course must be taken from the following list:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 303</td>
<td>Introduction to Real-Time Digital Signal Processing</td>
<td></td>
</tr>
<tr>
<td>ECE 304</td>
<td>Electric Machines Laboratory</td>
<td></td>
</tr>
<tr>
<td>ECE 305</td>
<td>Semiconductor Properties Laboratory</td>
<td></td>
</tr>
<tr>
<td>ECE 306</td>
<td>Linear Active Circuits Laboratory</td>
<td></td>
</tr>
<tr>
<td>ECE 308</td>
<td>Nonlinear Electronic Circuits Laboratory</td>
<td></td>
</tr>
<tr>
<td>ECE 313</td>
<td>Optoelectronics Lab</td>
<td></td>
</tr>
<tr>
<td>ECE 315</td>
<td>Introductory Microprocessor Laboratory</td>
<td></td>
</tr>
<tr>
<td>ECE 317</td>
<td>Sensors Laboratory</td>
<td></td>
</tr>
<tr>
<td>ECE 432</td>
<td>Digital Signal Processing Laboratory</td>
<td></td>
</tr>
<tr>
<td>ECE 453</td>
<td>Embedded Microprocessor System Design</td>
<td></td>
</tr>
<tr>
<td>ECE 504</td>
<td>Electric Machine &amp; Drive System Laboratory</td>
<td></td>
</tr>
<tr>
<td>ECE 512</td>
<td>Power Electronics Laboratory</td>
<td></td>
</tr>
<tr>
<td>ECE 545</td>
<td>Advanced Microwave Measurements for Communications</td>
<td></td>
</tr>
<tr>
<td>ECE 549</td>
<td>Integrated Circuit Fabrication Laboratory</td>
<td></td>
</tr>
<tr>
<td>ECE 554</td>
<td>Digital Engineering Laboratory</td>
<td></td>
</tr>
<tr>
<td>ECE/M/E 577</td>
<td>Automatic Controls Laboratory</td>
<td></td>
</tr>
</tbody>
</table>

### Fields & Waves

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 320</td>
<td>Electrodynamics II</td>
<td>3</td>
</tr>
<tr>
<td>ECE 420</td>
<td>Electromagnetic Wave Transmission</td>
<td>3</td>
</tr>
<tr>
<td>ECE 434</td>
<td>Photonics</td>
<td>3</td>
</tr>
<tr>
<td>ECE 440</td>
<td>Electromagnetic Fields and Waves</td>
<td>3</td>
</tr>
<tr>
<td>ECE/N/E/P 525</td>
<td>Introduction to Plasmas</td>
<td>3</td>
</tr>
<tr>
<td>ECE/N/E/PHYSICS 527</td>
<td>Plasma Confinement and Heating</td>
<td>3</td>
</tr>
<tr>
<td>ECE/N/E 528</td>
<td>Plasma Processing and Technology</td>
<td>3</td>
</tr>
<tr>
<td>ECE 536</td>
<td>Integrated Optics and Optoelectronics</td>
<td>3</td>
</tr>
<tr>
<td>ECE/PHYSICS 546</td>
<td>Lasers</td>
<td>2-3</td>
</tr>
<tr>
<td>ECE 547</td>
<td>Advanced Communications Circuit Design ^1</td>
<td>3</td>
</tr>
</tbody>
</table>

### Systems & Control

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 332</td>
<td>Feedback Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 334</td>
<td>State Space Systems Analysis</td>
<td>3</td>
</tr>
<tr>
<td>ECE/M/E 439</td>
<td>Introduction to Robotics ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE/B/M/E 461</td>
<td>Mathematical and Computer Modeling of Physiological Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE/M/E 577</td>
<td>Automatic Controls Laboratory</td>
<td></td>
</tr>
</tbody>
</table>

### Power & Machines

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 355</td>
<td>Electromechanical Energy Conversion</td>
<td>3</td>
</tr>
<tr>
<td>ECE 356</td>
<td>Electric Power Processing for Alternative Energy Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 411</td>
<td>Introduction to Electric Drive Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 412</td>
<td>Power Electronic Circuits ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE 427</td>
<td>Electric Power Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 504</td>
<td>Electric Machine &amp; Drive System Laboratory</td>
<td>2-3</td>
</tr>
<tr>
<td>ECE 511</td>
<td>Theory and Control of Synchronous Machines</td>
<td>3</td>
</tr>
<tr>
<td>ECE 512</td>
<td>Power Electronics Laboratory ^1</td>
<td>3</td>
</tr>
</tbody>
</table>

### Communications & Signal Processing

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 331</td>
<td>Introduction to Random Signal Analysis and Statistics</td>
<td>3</td>
</tr>
<tr>
<td>ECE 431</td>
<td>Digital Signal Processing ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE 432</td>
<td>Digital Signal Processing Laboratory ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE/COMP SCI/MATH 435</td>
<td>Introduction to Cryptography</td>
<td>3</td>
</tr>
<tr>
<td>ECE 436</td>
<td>Communication Systems I ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE 437</td>
<td>Communication Systems II ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE 447</td>
<td>Applied Communications Systems ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE/COMP SCI/M/E 532</td>
<td>Matrix Methods in Machine Learning ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE/COMP SCI 533</td>
<td>Image Processing ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE 537</td>
<td>Communication Networks ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE/COMP SCI/M/E 539</td>
<td>Introduction to Artificial Neural Network and Fuzzy Systems ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE/MATH 641</td>
<td>Introduction to Error-Correcting Codes</td>
<td>3</td>
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### Circuits & Devices

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 335</td>
<td>Microelectronic Devices</td>
<td>3</td>
</tr>
<tr>
<td>ECE 342</td>
<td>Electronic Circuits II</td>
<td>3</td>
</tr>
<tr>
<td>ECE 401</td>
<td>Electro-Acoustical Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ECE 445</td>
<td>Semiconductor Physics and Devices</td>
<td>3</td>
</tr>
<tr>
<td>ECE/B/M/E 462</td>
<td>Medical Instrumentation ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE 466</td>
<td>Electronics of Solids</td>
<td>3</td>
</tr>
<tr>
<td>ECE 541</td>
<td>Analog MOS Integrated Circuit Design ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE 542</td>
<td>Introduction to Microelectromechanical Systems ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE/CBE/M/S&amp;E 544</td>
<td>Processing of Electronic Materials</td>
<td>3</td>
</tr>
<tr>
<td>ECE 545</td>
<td>Advanced Microwave Measurements for Communications ^1</td>
<td>3</td>
</tr>
<tr>
<td>ECE 548</td>
<td>Integrated Circuit Design ^1</td>
<td>3</td>
</tr>
</tbody>
</table>
**Electrical Engineering, B.S.**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 549</td>
<td>Integrated Circuit Fabrication Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>ECE 555</td>
<td>Digital Circuits and Components ¹</td>
<td>3</td>
</tr>
</tbody>
</table>

**Computers & Computing**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 353</td>
<td>Introduction to Microprocessor Systems</td>
<td>3</td>
</tr>
<tr>
<td>ECE 453</td>
<td>Embedded Microprocessor System Design ¹</td>
<td>4</td>
</tr>
<tr>
<td>ECE 454</td>
<td>Mobile Computing Laboratory ¹</td>
<td>4</td>
</tr>
<tr>
<td>ECE/BME 463</td>
<td>Computers in Medicine</td>
<td>3</td>
</tr>
<tr>
<td>ECE 551</td>
<td>Digital System Design and Synthesis ¹</td>
<td>3</td>
</tr>
<tr>
<td>ECE/COMP SCI 552</td>
<td>Introduction to Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>ECE 553</td>
<td>Testing and Testable Design of Digital Systems ¹</td>
<td>3</td>
</tr>
<tr>
<td>ECE 554</td>
<td>Digital Engineering Laboratory ¹</td>
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</tr>
<tr>
<td>ECE 556</td>
<td>Design Automation of Digital Systems ¹</td>
<td>3</td>
</tr>
</tbody>
</table>

¹ Designated as a capstone course. Students can also take ECE 491 Senior Design Project for capstone credit.

**PROFESSIONAL ELECTIVES**

Classes to be taken in an area of professional interest. The following courses are acceptable as professional electives if the courses are not used to meet any other degree requirements.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MATH/COMP SCI 240</td>
<td>Introduction to Discrete Mathematics</td>
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<tr>
<td>ECE 320</td>
<td>Electrodynamics II</td>
<td></td>
</tr>
<tr>
<td>ECE 331</td>
<td>Introduction to Random Signal Analysis and Statistics</td>
<td></td>
</tr>
<tr>
<td>ECE 322</td>
<td>Feedback Control Systems</td>
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</tr>
<tr>
<td>ECE 334</td>
<td>State Space Systems Analysis</td>
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</tr>
<tr>
<td>ECE 335</td>
<td>Microelectronic Devices</td>
<td></td>
</tr>
<tr>
<td>ECE 342</td>
<td>Electronic Circuits II</td>
<td></td>
</tr>
<tr>
<td>ECE 353</td>
<td>Introduction to Microprocessor Systems</td>
<td></td>
</tr>
<tr>
<td>ECE/COMP SCI 354</td>
<td>Machine Organization and Programming</td>
<td></td>
</tr>
<tr>
<td>ECE 355</td>
<td>Electromechanical Energy Conversion</td>
<td></td>
</tr>
<tr>
<td>ECE 356</td>
<td>Electric Power Processing for Alternative Energy Systems</td>
<td></td>
</tr>
<tr>
<td>ECE courses numbered 399 and higher</td>
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<td></td>
</tr>
<tr>
<td>COMP SCI courses numbered 400 and higher</td>
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<tr>
<td>MATH 319</td>
<td>Techniques in Ordinary Differential Equations</td>
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</tr>
<tr>
<td>MATH 320</td>
<td>Linear Algebra and Differential Equations ¹</td>
<td></td>
</tr>
<tr>
<td>MATH 321</td>
<td>Applied Mathematical Analysis</td>
<td></td>
</tr>
<tr>
<td>MATH 322</td>
<td>Applied Mathematical Analysis</td>
<td></td>
</tr>
</tbody>
</table>

**MATH 340** Elementary Matrix and Linear Algebra ¹

**MATH 341** Linear Algebra

MATH courses numbered 400 and higher

STATS courses numbered 400 and higher

Any biological science course that is designated as intermediate or advanced

Any physical science course that is designated as intermediate or advanced

Any natural science course that is designated as advanced except that Math, Computer Sciences, and Statistics courses must follow the above criteria

Engineering courses numbered 300 and higher that are not ECE or cross-listed with ECE

Up to six credits of Professional Electives can be taken from School of Business classes numbered 300 and higher.

**DS 501** Special Topics (Wearable Technologies)

**DANCE 560** Current Topics in Dance: Workshop (Making Digital Lighting Controls)

Students may only earn degree credit for MATH 320 Linear Algebra and Differential Equations or MATH 340 Elementary Matrix and Linear Algebra, not both.

**COMMUNICATION SKILLS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGL 100</td>
<td>Introduction to College Composition</td>
<td>3</td>
</tr>
<tr>
<td>or LSC 100</td>
<td>Science and Storytelling</td>
<td></td>
</tr>
<tr>
<td>or COM ARTS 100</td>
<td>Introduction to Speech Composition</td>
<td></td>
</tr>
<tr>
<td>or COM ARTS 181</td>
<td>Elements of Speech-Honors Course</td>
<td></td>
</tr>
<tr>
<td>or ESL 118</td>
<td>Academic Writing II</td>
<td></td>
</tr>
<tr>
<td>EPD 397</td>
<td>Technical Communication</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Credits 6

**LIBERAL STUDIES ELECTIVES**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>College of Engineering Liberal Studies Requirements</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete requirements (<a href="http://guide.wisc.edu/undergraduate/engineering/#requirementstext">http://guide.wisc.edu/undergraduate/engineering/#requirementstext</a>) ¹</td>
<td>15</td>
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</tr>
</tbody>
</table>

Total Credits 15

¹ All liberal studies credits must be identified with the letter H, S, L, or Z. Language courses are acceptable without the letter and are considered humanities. **Note:** See an ECE advisor and/or the EE Curriculum Guide for additional information.

**TOTAL DEGREE CREDITS: 120**

**UNIVERSITY DEGREE REQUIREMENTS**

Total Degree To receive a bachelor’s degree from UW-Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.
Residency: Degree candidates are required to earn a minimum of 30 credits in residence at UW–Madison. "In residence" means on the UW–Madison campus with an undergraduate degree classification. "In residence" credit also includes UW–Madison courses offered in distance or online formats and credits earned in UW–Madison Study Abroad/Study Away programs.

Quality of Work: Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.

**LEARNING OUTCOMES**

1. (a) an ability to apply knowledge of mathematics, science, and engineering.
2. (b) an ability to design and conduct experiments, as well as to analyze and interpret data.
3. (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. (d) an ability to function on multidisciplinary teams.
5. (e) an ability to identify, formulate, and solve engineering problems.
6. (f) an understanding of professional and ethical responsibility.
7. (g) an ability to communicate effectively.
8. (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
9. (i) a recognition of the need for, and an ability to engage in life-long learning.
10. (j) a knowledge of contemporary issues.
11. (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

**FOUR-YEAR PLAN**

**SAMPLE FOUR-YEAR PLAN**

**First Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 109</td>
<td>5</td>
<td>ECE/COMP SCI 252</td>
<td>2</td>
</tr>
<tr>
<td>MATH 221</td>
<td>5</td>
<td>PHYSICS 201</td>
<td>5</td>
</tr>
<tr>
<td>ECE 210</td>
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<td>MATH 222</td>
<td>4</td>
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<tr>
<td>Liberal Studies Elective</td>
<td>3</td>
<td>Communication A</td>
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</table>

**Second Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYSICS 202</td>
<td>5</td>
<td>ECE 220</td>
<td>3</td>
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</table>

**Third Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE/PHYSICS 235</td>
<td>3</td>
<td>ECE Advanced Elective</td>
<td>3</td>
</tr>
<tr>
<td>Statistics/Probability Elective</td>
<td>3</td>
<td>ECE Advanced Elective</td>
<td>3</td>
</tr>
<tr>
<td>ECE 340</td>
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<td>EPD 397</td>
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</tr>
<tr>
<td>ECE 271</td>
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<td>EE Advanced Lab (3XX)</td>
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<td>ECE/COMP SCI 352</td>
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<td>Liberal Studies Elective</td>
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<tr>
<td>ECE 330</td>
<td>3</td>
<td>Professional Elective</td>
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</table>

**Fourth Year**

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits</th>
<th>Spring</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberal Studies Elective</td>
<td>3</td>
<td>Professional Elective</td>
<td>3</td>
</tr>
<tr>
<td>ECE Advanced Elective</td>
<td>3</td>
<td>ECE Advanced Elective (4XX)</td>
<td>3</td>
</tr>
<tr>
<td>ECE Advanced Elective</td>
<td>4</td>
<td>ECE Advanced Elective (4XX)</td>
<td>3</td>
</tr>
<tr>
<td>EE Advanced Lab (3XX)</td>
<td>1</td>
<td>ECE Capstone Design</td>
<td>3</td>
</tr>
<tr>
<td>ECE 370</td>
<td>2</td>
<td>Free Elective</td>
<td>1</td>
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<tr>
<td>Professional Elective</td>
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</tbody>
</table>

**Total Credits 120**

**ADVISING AND CAREERS**

**ADVISING**

Each College of Engineering program has academic advisors dedicated to serving its students. Program advisors can help current College of Engineering students with questions about accessing courses, navigating degree requirements, resolving academic issues and more. Students can find their assigned advisor on the homepage of their student center.

**ENGINEERING CAREER SERVICES**

Engineering Career Services (ECS) assists students in identifying pre-professional work-based learning experiences such as co-ops and summer internships, considering and applying to graduate or professional school, and finding full-time professional employment during their graduation year.

ECS offers two major career fairs per year, assists with resume writing and interviewing skills, hosts workshops on the job search, and meets one-on-one with students to discuss offer negotiations.

Students are encouraged to utilize the ECS office early in their academic careers. For comprehensive information on ECS programs and workshops, see the ECS website or call 608-262-3471.
PEOPLE

PROFESSORS
Hagness (chair)
Anderson
Barmish
Booske
Behdad
Boston
Botez
DeMarco
Gubner (vice chair)
Hitchon
Hu
Jahns
Jiang*
Knezevic
Lesieutre
Lipasti
Ma
Mawst
Nowak
Ramanathan (vice chair)
Sayeed
Sethares
Shohet
van der Weide
Van Veen
Venkataramanan
Wendt

ASSOCIATE PROFESSORS
Davoodi
Milenkovic
Willet

ASSISTANT PROFESSORS
Farrell
Fawaz
Jog
Kats
Kim
Lessard
Li
Loh
Ludois
Papaliopoulos
San Miguel
Severson
Velten
Yu

FACULTY ASSOCIATES
Allie
Fredette
Hoffman
Krachey
Lu
Milicic

*For scholarship information, please contact Professor Jiang.

ACCREDITATION

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ABET (http://www.abet.org)