2018 - 2019 Major Map
Computer Science (Cybersecurity), BS
School/College: Ira A. Fulton Schools of Engineering
Location: Tempe campus
ESCSEIBS

<table>
<thead>
<tr>
<th>Term 1 0 - 15 Credit Hours Critical course signified by</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>CSE 110: Principles of Programming with Java (CS)</td>
<td>3</td>
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<tr>
<td>MAT 265: Calculus for Engineers I (MA)</td>
<td>3</td>
<td>C</td>
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<tr>
<td>ASU 101-CSE: The ASU Experience</td>
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<tr>
<td>ENG 101 or ENG 102: First-Year Composition OR</td>
<td></td>
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<tr>
<td>ENG 105: Advanced First-Year Composition OR</td>
<td>3</td>
<td>C</td>
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<tr>
<td>FSE 100: Introduction to Engineering</td>
<td>2</td>
<td>C</td>
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<tr>
<td>Social-Behavioral Sciences (SB) AND Global Awareness (G)</td>
<td>3</td>
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<tr>
<td>Minimum 2.00 GPA ASU Cumulative.</td>
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Term hours subtotal: 15

<table>
<thead>
<tr>
<th>Term 2 15 - 31 Credit Hours Critical course signified by</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CSE 205: Object-Oriented Programming and Data Structures (CS)</td>
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<tr>
<td>MAT 266: Calculus for Engineers II (MA)</td>
<td>3</td>
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<tr>
<td>ENG 101 or ENG 102: First-Year Composition OR</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>ENG 105: Advanced First-Year Composition OR</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Lab Science Requirement AND Natural Science - Quantitative (SQ)</td>
<td>4</td>
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<tr>
<td>Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C)</td>
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<tr>
<td>Complete ENG 101 OR ENG 105 OR ENG 107 course(s).</td>
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<td>Minimum 2.00 GPA ASU Cumulative.</td>
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Term hours subtotal: 16

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<th>Term 3 31 - 47 Credit Hours Critical course signified by</th>
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<tr>
<td>CSE 120: Digital Design Fundamentals</td>
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<td>MAT 243: Discrete Mathematical Structures</td>
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<tr>
<td>MAT 267: Calculus for Engineers III (MA) OR CSE 259: Logic in Computer Science</td>
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Complete Mathematics (MA) requirement.

Term hours subtotal: 16
## Term 4 - 63 Credit Hours

<table>
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<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CSE 230: Computer Organization and Assembly Language Programming</td>
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<tr>
<td>CSE 240: Introduction to Programming Languages</td>
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<tr>
<td>MAT 343: Applied Linear Algebra</td>
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<tr>
<td>Lab Science Requirement AND Natural Science - Quantitative (SQ) or Natural Science - General (SG)</td>
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<tr>
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Minimum 2.00 GPA ASU Cumulative.

Term hours subtotal: 16

## Term 5 - 63 - 79 Credit Hours

<table>
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<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CSE 310: Data Structures and Algorithms</td>
<td>3</td>
<td>C</td>
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<tr>
<td>CSE 301: Computing Ethics</td>
<td>1</td>
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<tr>
<td>CSE 360: Introduction to Software Engineering</td>
<td>3</td>
<td>C</td>
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<tr>
<td>CSE 365: Information Assurance</td>
<td>3</td>
<td>C</td>
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<tr>
<td>IEE 380: Probability and Statistics for Engineering Problem Solving (CS)</td>
<td>3</td>
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<td>Elective</td>
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Term hours subtotal: 16

## Term 6 - 79 - 94 Credit Hours

<table>
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<tr>
<th>Course</th>
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<tr>
<td>CSE 340: Principles of Programming Languages</td>
<td>3</td>
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<tr>
<td>CSE 330: Operating Systems</td>
<td>3</td>
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<tr>
<td>CSE 355: Introduction to Theoretical Computer Science</td>
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<tr>
<td>Upper Division Technical Elective</td>
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</tr>
<tr>
<td>Humanities, Arts and Design (HU)</td>
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<tr>
<td>Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s),</td>
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Term hours subtotal: 15

## Term 7 - 94 - 108 Credit Hours

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<th>Course</th>
<th>Hours</th>
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<tr>
<td>CSE 485: Computer Science Capstone Project I (L)</td>
<td>3</td>
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<td>CSE 466: Computer Systems Security</td>
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<tr>
<td>CSE 468: Computer Network Security</td>
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<tr>
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Term hours subtotal: 14

## Term 8 - 108 - 120 Credit Hours

<table>
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<th>Course</th>
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<tbody>
<tr>
<td>CSE 486: Computer Science Capstone Project II (L)</td>
<td>3</td>
<td>C</td>
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</tr>
<tr>
<td>CSE 412: Database Management OR CSE 434: Computer Networks OR CSE 445: Distributed Software Development</td>
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<td>C</td>
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Term hours subtotal: 14
<table>
<thead>
<tr>
<th>Lab Science Requirement</th>
<th>Information Assurance Elective</th>
<th>Technical Electives</th>
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<tbody>
<tr>
<td>BIO 181: General Biology I (SQ)</td>
<td>CSE 460: Software Analysis and Design</td>
<td>AEE 415: Vibration Analysis</td>
</tr>
<tr>
<td>BIO 182: General Biology II (SG)</td>
<td>CSE 463: Introduction to Human Computer Interaction</td>
<td>AEE 426: Design of Aerospace Structures</td>
</tr>
<tr>
<td>CHM 113: General Chemistry I (SQ)</td>
<td>CSE 471: Introduction to Artificial Intelligence</td>
<td>AEE 462: Space Vehicle Dynamics and Control</td>
</tr>
<tr>
<td>CHM 116: General Chemistry II (SQ)</td>
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<td>AEE 463: Aircraft Propulsion</td>
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<tr>
<td>GLG 101: Introduction to Geology I (Physical) (SQ) AND GLG 103: Introduction to Geology I-Laboratory (SQ)</td>
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<td>AEE 465: Rocket Propulsion</td>
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<tr>
<td>GLG 102: Introduction to Geology II (Historical) (SG &amp; H) AND GLG 104: Introduction to Geology II-Laboratory (SG)</td>
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<td>AEE 468: Aircraft Systems Design</td>
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<tr>
<td>GLG 110: Dangerous World (SG &amp; G) AND GLG 111: Dangerous World Laboratory (SG)</td>
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<td>AEE 469: Projects in Astronautics or Aeronautics</td>
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<tr>
<td>PHY 121: University Physics I: Mechanics (SQ) AND PHY 122: University Physics Laboratory I (SQ)</td>
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<td>AEE 471: Computational Fluid Dynamics</td>
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<tr>
<td>PHY 131: University Physics II: Electricity and Magnetism (SQ) AND PHY 132: University Physics Laboratory II (SQ)</td>
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<td>AME 430: Mac Development for Media Arts</td>
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<td></td>
<td></td>
<td>BCH 361: Advanced Principles of Biochemistry</td>
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<td>BCH 461: General Biochemistry</td>
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<tr>
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<td>BCH 462: General Biochemistry</td>
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<tr>
<td></td>
<td></td>
<td>BCH 465: Protein and Nucleic Acid Biochemistry</td>
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<tr>
<td></td>
<td></td>
<td>BIO 340: General Genetics</td>
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<td></td>
<td></td>
<td>BIO 343: Genetic Engineering and Society (L)</td>
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<td></td>
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<td>BIO 345: Evolution</td>
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<td>BME 350: Signals and Systems for Bioengineers</td>
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<td></td>
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<td>BME 413: Biomedical Instrumentation (L)</td>
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<td>BME 416: Advanced Biomechanics</td>
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<td>BME 419: Biocontrol Systems</td>
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<td>CEE 412: Pavement Analysis and Design</td>
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<tr>
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<td>CEE 423: Structural Design</td>
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<td></td>
<td></td>
<td>CEE 432: Developing Software for Engineering Applications</td>
</tr>
<tr>
<td></td>
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<td>CEE 440: Hydrology</td>
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</table>

Please see course lists below for Technical Electives. Contact CIDSE Advising or visit the CIDSE website for additional information.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>CEE 441</td>
<td>Water Resources Engineering</td>
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<tr>
<td>CEE 452</td>
<td>Foundations</td>
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<tr>
<td>CEE 462</td>
<td>Unit Operations in Environmental Engineering</td>
</tr>
<tr>
<td>CEE 466</td>
<td>Urban Water System Design</td>
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<tr>
<td>CEE 467</td>
<td>Environmental Microbiology</td>
</tr>
<tr>
<td>CEE 474</td>
<td>Transportation Systems Planning</td>
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<tr>
<td>CEE 475</td>
<td>Highway Geometric Design</td>
</tr>
<tr>
<td>CEE 481</td>
<td>Civil Engineering Project Management</td>
</tr>
<tr>
<td>CEE 483</td>
<td>Highway Materials, Construction, and Quality</td>
</tr>
<tr>
<td>CEE 486</td>
<td>Integrated Civil Engineering Design (L)</td>
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<tr>
<td>CHE 342</td>
<td>Introduction to Applied Chemical Thermodynamics</td>
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<tr>
<td>CHE 432</td>
<td>Principles of Chemical Engineering Design</td>
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<td>CHE 442</td>
<td>Introduction to Chemical Reactor Design</td>
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<td>CHE 461</td>
<td>Process Dynamic Control (CS)</td>
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<td>CHE 462</td>
<td>Process Design (L)</td>
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<td>CHE 469</td>
<td>Air Quality Engineering</td>
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<td>CHE 475</td>
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<td>CIS 415</td>
<td>Big Data Analytics in Business</td>
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<td>CPI 350</td>
<td>Evaluation of Informatics Systems</td>
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<tr>
<td>CPI 360</td>
<td>Decision Making and Problem Solving</td>
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<tr>
<td>CPI 411</td>
<td>Graphics for Games</td>
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<td>CPI 412</td>
<td>Cognitive Systems and Intelligent Agents</td>
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<tr>
<td>CPI 460</td>
<td>Intelligent Interactive Instructional Systems</td>
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<tr>
<td>CPI 462</td>
<td>Design for Learning in Virtual Worlds</td>
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<tr>
<td>CSE 325</td>
<td>Embedded Microprocessor Systems</td>
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<td>CSE 335</td>
<td>Principles of Mobile Application Development</td>
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<td>CSE 481</td>
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<tr>
<td>CSE 483</td>
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<td>CSE 486</td>
<td>Integrated Civil Engineering Design (L)</td>
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<td>CPI 460</td>
<td>Intelligent Interactive Instructional Systems</td>
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<td>CPI 462</td>
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Technical Electives continued

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<tbody>
<tr>
<td>EEE 304</td>
<td>Signals and Systems II</td>
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<td>EEE 333</td>
<td>Hardware Design Languages and Programmable Logic</td>
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<td>EEE 350</td>
<td>Random Signal Analysis</td>
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<tr>
<td>EEE 360</td>
<td>Energy Systems and Power Electronics</td>
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<td>EEE 404</td>
<td>Real-Time DSP Systems</td>
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<td>EEE 407</td>
<td>Digital Signal Processing</td>
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<td>EEE 425</td>
<td>Digital Systems and Circuits</td>
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<td>EEE 433</td>
<td>Analog Integrated Circuits</td>
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<td>EEE 434</td>
<td>Quantum Mechanics for Engineers</td>
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<td>EEE 435</td>
<td>Fundamentals of CMOS and MEMS</td>
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<td>EEE 436</td>
<td>Fundamentals of Solid-State Devices</td>
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<td>Optoelectronics</td>
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<td>EEE 439</td>
<td>Semiconductor Facilities and Cleanroom Practices</td>
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<td>EEE 443</td>
<td>Antennas for Wireless Communications</td>
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<td>EEE 445</td>
<td>Microwaves</td>
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<td>EEE 448</td>
<td>Fiber Optics</td>
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<td>EEE 455</td>
<td>Communication Systems</td>
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<td>EEE 459</td>
<td>Communication Networks</td>
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<td>EEE 460</td>
<td>Nuclear Power Engineering</td>
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<td>EEE 463</td>
<td>Electrical Power Plants</td>
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<td>EEE 470</td>
<td>Electric Power Devices</td>
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<td>EEE 471</td>
<td>Power System Analysis</td>
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<td>EEE 473</td>
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<td>EEE 480</td>
<td>Feedback Systems</td>
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<td>EEE 481</td>
<td>Computer-Controlled Systems</td>
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<tr>
<td>FSE 301</td>
<td>Entrepreneurship and Value Creation</td>
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<tr>
<td>IEE 376</td>
<td>Operations Research Deterministic Techniques/Applications</td>
</tr>
<tr>
<td>IEE 381</td>
<td>Lean Six Sigma Methodology</td>
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<tr>
<td>IEE 385</td>
<td>Engineering Statistics: Probability</td>
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<td>IEE 412</td>
<td>Introduction to Financial Engineering</td>
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<td>IEE 426</td>
<td>Operations Research in Healthcare</td>
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<tr>
<td>IEE 431</td>
<td>Engineering Administration (L)</td>
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<tr>
<td>IEE 456</td>
<td>Introduction to Systems Engineering</td>
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<td>IEE 458</td>
<td>Project Management</td>
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<td>IEE 461</td>
<td>Production Control</td>
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<td>IEE 470</td>
<td>Stochastic Operations Research</td>
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<td>IEE 474</td>
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<td>IEE 475</td>
<td>Simulating Stochastic Systems (CS)</td>
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<td>Mechanism Analysis and Design</td>
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<td>MAE 404</td>
<td>Finite Elements in Engineering</td>
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<td>MAE 406</td>
<td>Advanced CAE Simulation</td>
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<tr>
<td>MAE 417</td>
<td>System Dynamics and Control II</td>
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<td>MAE 436</td>
<td>Combustion</td>
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<tr>
<td>MAE 455</td>
<td>Polymers and Composites</td>
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<td>MEE 434</td>
<td>Internal Combustion Engines</td>
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<td>MEE 446</td>
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<tr>
<td>PHY 302</td>
<td>Mathematical Methods in Physics II</td>
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<tr>
<td>PHY 361</td>
<td>Introductory Modern Physics</td>
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<td>PHY 462</td>
<td>Particle and Nuclear Physics</td>
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<td>PHY 494</td>
<td>Computational Methods in Physics</td>
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<td>SER 421</td>
<td>Web-Based Applications and Mobile Systems</td>
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<td>STP 421</td>
<td>Probability</td>
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<td>STP 425</td>
<td>Stochastic Processes</td>
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<td>STP 427</td>
<td>Mathematical Statistics</td>
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<tr>
<td>STP 429</td>
<td>Experimental Statistics (CS)</td>
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**NOTE:** Maximum 3 hours CSE 484 or FSE 301. Maximum 6 hours of CSE 484, 492, 493 or 499. Some Technical Electives may require additional prerequisites.

**Total Hours:** 120

**Upper Division Hours:** 45 minimum

**Major GPA:** 2.00 minimum

**Cumulative GPA:** 2.00 minimum

**Total hrs at ASU:** 30 minimum

**Hrs Resident Credit for Academic Recognition:** 56 minimum

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**General University Requirements Legend**

**General Studies Core Requirements:**
- Literacy and Critical Inquiry (L)
- Mathematical Studies (MA)
- Computer/Statistics/Quantitative Applications (CS)
- Humanities, Arts and Design (HU)
**Total Community College Hrs:** 64 maximum

- Social-Behavioral Sciences (SB)
- Natural Science - Quantitative (SQ)
- Natural Science - General (SG)

General Studies Awareness Requirements:
- Cultural Diversity in the U.S. (C)
- Global Awareness (G)
- Historical Awareness (H)

First-Year Composition

General Studies designations listed on the major map are current for the 2018 - 2019 academic year.