




















## 2024 - 2025 Major Map



### Computer Science (Software Engineering), BS

School/College: Ira A. Fulton Schools of Engineering  
 ESCSESBS


Term 1 0 - 15 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 CSE 110: Principles of Programming (QTRS OR CS)	3	C	<ul style="list-style-type: none"> <li>ASU 101 or college-specific equivalent First-Year Seminar required of all first-year students and should be taken in the first semester.</li> <li>If ENG 105 is taken, a three (3) credit hour elective must also be taken prior to graduation.</li> <li>Prep for success using the <a href="#">First-Year Student Guide</a>.</li> <li>Join a <a href="#">Fulton community</a>.</li> <li>Explore <a href="#">engineering and technical professions</a>.</li> </ul>
ASU 101-CAI: The ASU Experience	1		
ENG 101 or ENG 102: First-Year Composition OR			
ENG 105: Advanced First-Year Composition OR	3	C	
ENG 107 or ENG 108: First-Year Composition			
FSE 100: Introduction to Engineering	2	C	
MAT 265: Calculus for Engineers I (MATH OR MA)	3	C	
Humanities, Arts and Design (HUAD)	3		
 Minimum 2.00 GPA ASU Cumulative.			
Term hours subtotal:	15		
Term 2 15 - 30 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 CSE 205: Object-Oriented Programming and Data Structures (QTRS OR CS)	3	C	<ul style="list-style-type: none"> <li>Create a <a href="#">Handshake</a> profile.</li> <li>Get involved with EPICS, the Generator Labs, and the <a href="#">Fulton Start-Up Center</a>.</li> </ul>
ENG 101 or ENG 102: First-Year Composition OR			
ENG 105: Advanced First-Year Composition OR	3	C	
ENG 107 or ENG 108: First-Year Composition			
MAT 266: Calculus for Engineers II (MATH OR MA)	3	C	
Humanities, Arts and Design (HUAD)	3		
Additional Scientific Thinking in Natural Sciences (SCIT) Course	3		
 Complete ENG 101 OR ENG 105 OR ENG 107 course(s).			
 Complete MAT 170 OR MAT 171 OR MAT 265 OR MAT 270 course(s).			
 Minimum 2.00 GPA ASU Cumulative.			
Term hours subtotal:	15		
Term 3 30 - 46 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 CSE 240: Introduction to Programming Languages	3	C	<ul style="list-style-type: none"> <li>Prep for success using the <a href="#">Sophomore Guide</a></li> </ul>
 EEE 120: Digital Design Fundamentals	3	C	
 MAT 243: Discrete Mathematical Structures	3	C	
MAT 267: Calculus for Engineers III (MATH OR MA) OR CSE			
259: Logic in Computer Science	3	C	
Scientific Thinking in Natural Sciences (SCIT)	4		
 Complete MAT 266 OR MAT 271 course(s).			
 Minimum 2.00 GPA ASU Cumulative.			
Complete Mathematics (MATH) requirement.			



Term hours subtotal: 16

Term 4 46 - 62 Credit Hours <b>Critical course signified by</b> 	Hours	Minimum Grade	Notes
 CSE 230: Computer Organization and Assembly Language Programming	3	C	<ul style="list-style-type: none"> <li>Pursue an <b>undergraduate research experience</b>.</li> <li>Apply for <b>internships</b>.</li> <li>Attend <b>career fairs and events</b>.</li> </ul>
 CSE 310: Data Structures and Algorithms	3	C	
IEE 380: Probability and Statistics for Engineering Problem Solving (QTRS OR CS)	3	C	
Scientific Thinking in Natural Sciences (SCIT)	4		
Social and Behavioral Sciences (SOBE)	3		
 Complete CSE 259 OR MAT 267 OR MAT 272 course(s).			
 Minimum 2.00 GPA ASU Cumulative.			
Term hours subtotal:	16		

Term 5 62 - 78 Credit Hours <b>Necessary course signified by</b> 	Hours	Minimum Grade	Notes
 CSE 355: Introduction to Theoretical Computer Science	3	C	<ul style="list-style-type: none"> <li>Plan for success using the <b>Junior Guide</b>.</li> <li>Network at <b>student organization</b> competitions or professional societies.</li> </ul>
CSE 301: Computing Ethics	1	C	
CSE 360: Introduction to Software Engineering	3	C	
CSE 365: Information Assurance	3	C	
MAT 343: Applied Linear Algebra	3	C	
American Institutions (AMIT)	3		
Term hours subtotal:	16		

Term 6 78 - 93 Credit Hours <b>Necessary course signified by</b> 	Hours	Minimum Grade	Notes
 CSE 330: Operating Systems	3	C	<ul style="list-style-type: none"> <li>Research and prepare for <b>graduate school</b>.</li> <li>Apply for an <b>engineering accelerated program</b>.</li> <li>Develop a <b>professional profile online</b>.</li> </ul>
 CSE 340: Principles of Programming Languages	3	C	
CSE 445: Distributed Software Development	3	C	
Global Communities, Societies and Individuals (GCSI)	3		
Governance and Civic Engagement (CIVI)	3		
Term hours subtotal:	15		

Term 7 93 - 108 Credit Hours <b>Necessary course signified by</b> 	Hours	Minimum Grade	Notes
 CSE 485: Computer Science Capstone Project I (L)	3	C	<ul style="list-style-type: none"> <li>Please see course lists below for Technical Electives. Contact SCAI Advising or visit the <b>SCAI website</b> for additional information.</li> <li>Students should take CSE 434 as the Upper Division Technical Elective in Term 7 if they plan on taking CSE 468 in Term 8. CSE 434 is a prerequisite for CSE 468.</li> <li>Plan for success using the <b>Senior Guide</b>.</li> <li>Use <b>Handshake</b> to apply for full-time positions.</li> <li>Complete an in person or virtual <b>practice interview</b>.</li> </ul>
CSE 460: Software Analysis and Design	3	C	
CSE 464: Software Quality Assurance and Testing	3	C	
Upper Division Technical Elective	3	C	
Sustainability (SUST)	3		
Term hours subtotal:	15		

Term 8 108 - 120 Credit Hours <b>Necessary course signified by</b> 	Hours	Minimum Grade	Notes
 CSE 486: Computer Science Capstone Project II (L)	3	C	<ul style="list-style-type: none"> <li>CSE 468 requires CSE 434 as a prerequisite.</li> </ul>
CSE 446: Software Integration and Engineering	3	C	

CSE 463: Introduction to Human Computer Interaction OR CSE 466: Computer Systems Security OR CSE 467: Data and Information Security OR CSE 468: Computer Network Security	3	C
Upper Division Technical Elective	3	C
Term hours subtotal:	12	

- Please see course lists below for Technical Electives. Contact SCAI Advising or visit the [SCAI website](#) for additional information.

- Maximum 3 hours of FSE 301 or FSE 404 can be applied towards major requirements.
- Maximum 6 hours of CSE 484, CSE 492, CSE 493, CSE 499, FSE 301, and FSE 404 can be applied towards major requirements.
- CSE 475 or DAT 402 can be applied towards major requirements but not both.
- Technical Electives may require additional prerequisites.
- For additional information on major curriculum please visit the [Computer Science Degree Requirements website](#) and the [Concentration Requirements Website](#).

#### Hide Course List(s)/Track Group(s)

Technical Electives	Technical Electives continued
AEE 415: Vibration Analysis	EEE 360: Energy Systems and Power Electronics
AEE 426: Design of Aerospace Structures	EEE 404: Real-Time DSP Systems
AEE 462: Space Vehicle Dynamics and Control	EEE 407: Digital Signal Processing
AEE 463: Aircraft Propulsion	EEE 425: Digital Systems and Circuits
AEE 465: Rocket Propulsion	EEE 433: Analog Integrated Circuits
AEE 468: Aircraft Systems Design	EEE 434: Quantum Mechanics for Engineers
AEE 471: Computational Fluid Dynamics	EEE 435: Fundamentals of CMOS and MEMS
AME 430: Mac Development for Media Arts	EEE 436: Fundamentals of Solid-State Devices
AME 435: Mobile Development	EEE 437: Optoelectronics
BCH 361: Advanced Principles of Biochemistry	EEE 439: Semiconductor Facilities and Cleanroom Practices
BCH 461: General Biochemistry	EEE 443: Antennas for Wireless Communications
BCH 462: General Biochemistry	EEE 445: Microwaves
BIO 340: General Genetics	EEE 448: Fiber Optics
BIO 343: Genetic Engineering and Society (L)	EEE 455: Communication Systems
BIO 345: Evolution	EEE 459: Communication Networks
BME 350: Signals and Systems for Bioengineers	EEE 460: Nuclear Power Engineering
BME 413: Biomedical Instrumentation (L)	EEE 463: Electrical Power Plants
BME 416: Advanced Biomechanics	EEE 470: Electric Power Devices
BME 494: Applied Computational Behavioral Science	EEE 471: Power System Analysis
CEE 412: Pavement Analysis and Design	EEE 473: Electrical Machinery
CEE 432: Developing Software for Engineering Applications	EEE 480: Feedback Systems
	EEE 481: Computer-Controlled Systems

CEE 440: Hydrology	FSE 301: Entrepreneurship and Value Creation
CEE 441: Water Resources Engineering	
CEE 452: Foundations	FSE 394: Engineering for Humanity
CEE 462: Unit Operations in Environmental Engineering	FSE 404: EPICS Gold: EPICS in Action
CEE 466: Urban Water System Design	IEE 376: Operations Research Deterministic Techniques/Applications
CEE 467: Environmental Microbiology	IEE 381: Lean Six Sigma Methodology
CEE 474: Transportation Systems Planning	IEE 385: Engineering Statistics: Probability
CEE 475: Highway Geometric Design	IEE 412: Introduction to Financial Engineering
CEE 481: Civil Engineering Project Management	IEE 426: Operations Research in Healthcare
CEE 483: Highway Materials, Construction, and Quality	IEE 431: Engineering Administration (L)
CEE 486: Integrated Civil Engineering Design (L)	IEE 456: Introduction to Systems Engineering
CHE 342: Introduction to Applied Chemical Thermodynamics	IEE 458: Project Management
CHE 432: Principles of Chemical Engineering Design	IEE 461: Production Control
CHE 442: Introduction to Chemical Reactor Design	IEE 470: Stochastic Operations Research
CHE 461: Process Dynamic Control (QTRS OR CS)	IEE 474: Quality Control
CHE 462: Process Design (L)	IEE 475: Simulating Stochastic Systems (QTRS OR CS)
CHE 469: Air Quality Engineering	MAE 341: Mechanism Analysis and Design
CHE 475: Biochemical Engineering	MAE 404: Finite Elements in Engineering
CIS 415: Big Data Analytics in Business	MAE 417: System Dynamics and Control II
CPI 311: Game Engine Development	MAE 436: Combustion
CPI 350: Evaluation of Informatics Systems	MAE 455: Polymers and Composites
CPI 360: Decision Making and Problem Solving	MAT Upper Division Elective
CPI 411: Graphics for Games	Except for: MAT 300, MAT 342, MAT 343, and MAT 485
CPI 460: Intelligent Interactive Instructional Systems	MEE 351: Manufacturing Processes
CPI 462: Design for Learning in Virtual Worlds	MEE 434: Internal Combustion Engines
CSE 320: Design and Synthesis of Digital Hardware	MEE 446: Energy Systems Design II
CSE 325: Embedded Microprocessor Systems	MSE 335: Materials Kinetics
CSE 335: Principles of Mobile Application Development	MSE 415: Mathematical and Computer Methods in Materials (CS)
CSE 4** Elective	PHY 302: Mathematical Methods in Physics II
	PHY 361: Introductory Modern Physics
	PHY 462: Particle and Nuclear Physics
	SER 416: Software Enterprise: Project and Process Management
	SER 421: Web-Based Applications
	SER 422: Web Application Programming

DAT 300: Mathematical Tools for Data Science	SER 423: Mobile Systems
DAT 301: Exploring Data in R and Python	STP 421: Probability
DAT 401: Statistical Modeling and Inference for Data Science	STP 425: Stochastic Processes
DAT 402: Machine Learning for Data Science	STP 427: Mathematical Statistics
EEE 304: Signals and Systems II	STP 429: Applied Regression (QTRS OR CS)
EEE 333: Hardware Design Languages and Programmable Logic	
EEE 335: Analog and Digital Circuits	
EEE 350: Random Signal Analysis	

- **Total Hours:** 120
- **Upper Division Hours:** 45 minimum
- **University Undergraduate Graduation Requirements**

**Notes:**

Mathematics Placement Assessment score determines placement in first mathematics course.

General Studies designations listed next to courses on the major map were valid for the 2024 - 2025 academic year. Please refer to the course catalog for current General Studies designations at time of class registration. General Studies credit is applied according to the designation the course carries at the time the class is taken.