# 2024 - 2025 Major Map

# Computer Science, BS

School/College: Ira A. Fulton Schools of Engineering

ESCSEBS

| Term 1 0 - 15 Credit Hours Critical course signified by ⚠ | Hours | Minimum Grade | Notes |
|---|---|---|---|
| ⚠ CSE 110: Principles of Programming (QTRS OR CS) | 3 | C | • ASU 101 or college-specific equivalent First-Year Seminar required of all first-year students and should be taken in the first semester. |
| ASU 101-CAI: The ASU Experience | 1 | | • If ENG 105 is taken, a three credit hour elective must also be taken prior to graduation. |
| ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition | 3 | C | • Prep for success using the First-Year Student Guide. |
| FSE 100: Introduction to Engineering | 2 | C | • Join a Fulton community. |
| MAT 265: Calculus for Engineers I (MATH OR MA) | 3 | C | • Explore engineering and technical professions. |
| Humanities, Arts and Design (HUAD) | 3 | | |
| ⚠ Complete Mathematics (MATH) requirement. | | | |
| ⚠ 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 | • Create a Handshake profile. |
| ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition | 3 | C | • Get involved with EPICS, the Generator Labs, and the Fulton Start-Up Center. |
| 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 |
|---|---|---|---|
| ⚠ EEE 120: Digital Design Fundamentals | 3 | C | • Prep for success using the Sophomore Guide. |
| ⚠ CSE 240: Introduction to Programming Languages | 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. | | | |

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|---|---|---|---|
| Complete Mathematics (MATH) requirement. | | | |
| Term hours subtotal: | 16 | | |

| **Term 4** 46 - 62 Credit Hours **Critical course signified by** ❗ | Hours | Minimum Grade | Notes |
|---|---|---|---|
| ❗ CSE 230: Computer Organization and Assembly Language Programming | 3 | C | • Pursue an undergraduate research experience.<br>• Apply for internships.<br>• Attend career fairs and events. |
| ❗ 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 **Necessary course signified by** ⭐ | Hours | Minimum Grade | Notes |
|---|---|---|---|
| ⭐ CSE 355: Introduction to Theoretical Computer Science | 3 | C | • Plan for success using the Junior Guide.<br>• Network at student organization competitions or professional societies. |
| 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 **Necessary course signified by** ⭐ | Hours | Minimum Grade | Notes |
|---|---|---|---|
| ⭐ CSE 340: Principles of Programming Languages | 3 | C | • Research and prepare for graduate school.<br>• Apply for an engineering accelerated program.<br>• Develop a professional profile online. |
| CSE 330: Operating Systems | 3 | C | |
| CSE 412: Database Management OR CSE 434: Computer Networks OR 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 **Necessary course signified by** ⭐ | Hours | Minimum Grade | Notes |
|---|---|---|---|
| ⭐ CSE 485: Computer Science Capstone Project I (L) | 3 | C | • Please see course lists below for Technical Electives. Contact SCAI Advising or visit the SCAI website for additional information.<br>• Plan for success using the Senior Guide.<br>• Use Handshake to apply for full-time positions.<br>• Complete an in person or virtual practice interview. |
| Upper Division Technical Elective | 3 | C | |
| *Complete 2 courses:* CSE 4** Elective | 6 | C | |
| Sustainability (SUST) | 3 | | |
| Term hours subtotal: | 15 | | |

| **Term 8** 108 - 120 Credit Hours **Necessary course signified by** ⭐ | Hours | Minimum Grade | Notes |
|---|---|---|---|
| ⭐ CSE 486: Computer Science Capstone Project II (L) | 3 | C | • Please see course lists below for Technical Electives. Contact SCAI Advising or visit the SCAI website for additional information. |
| Upper Division Technical Elective | 3 | C | |
| *Complete 2 courses:* CSE 4** Elective | 6 | C | |
| Term hours subtotal: | 12 | | |

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  - Maximum three hours of FSE 301 or FSE 404 can be applied towards major requirements.
  - Maximum six 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.

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 |
| CEE 440: Hydrology | EEE 481: Computer-Controlled Systems |
| CEE 441: Water Resources Engineering | FSE 301: Entrepreneurship and Value Creation |
| CEE 452: Foundations | FSE 394: Engineering for Humanity |
| | FSE 404: EPICS Gold: EPICS in Action |

CEE 462: Unit Operations in Environmental Engineering

CEE 466: Urban Water System Design

CEE 467: Environmental Microbiology

CEE 474: Transportation Systems Planning

CEE 475: Highway Geometric Design

CEE 481: Civil Engineering Project Management

CEE 483: Highway Materials, Construction, and Quality

CEE 486: Integrated Civil Engineering Design (L)

CHE 342: Introduction to Applied Chemical Thermodynamics

CHE 432: Principles of Chemical Engineering Design

CHE 442: Introduction to Chemical Reactor Design

CHE 461: Process Dynamic Control (QTRS OR CS)

CHE 462: Process Design (L)

CHE 469: Air Quality Engineering

CHE 475: Biochemical Engineering

CIS 415: Big Data Analytics in Business

CPI 311: Game Engine Development

CPI 350: Evaluation of Informatics Systems

CPI 360: Decision Making and Problem Solving

CPI 411: Graphics for Games

CPI 460: Intelligent Interactive Instructional Systems

CPI 462: Design for Learning in Virtual Worlds

CSE 320: Design and Synthesis of Digital Hardware

CSE 325: Embedded Microprocessor Systems

CSE 335: Principles of Mobile Application Development

CSE 4** Elective

DAT 300: Mathematical Tools for Data Science

DAT 301: Exploring Data in R and Python

DAT 401: Statistical Modeling and Inference for Data Science

IEE 376: Operations Research Deterministic Techniques/Applications

IEE 381: Lean Six Sigma Methodology

IEE 385: Engineering Statistics: Probability

IEE 412: Introduction to Financial Engineering

IEE 426: Operations Research in Healthcare

IEE 431: Engineering Administration (L)

IEE 456: Introduction to Systems Engineering

IEE 458: Project Management

IEE 461: Production Control

IEE 470: Stochastic Operations Research

IEE 474: Quality Control

IEE 475: Simulating Stochastic Systems (QTRS OR CS)

MAE 341: Mechanism Analysis and Design

MAE 404: Finite Elements in Engineering

MAE 417: System Dynamics and Control II

MAE 436: Combustion

MAE 455: Polymers and Composites

MAT Upper Division Elective

Except for: MAT 300, MAT 340, MAT 342, MAT 343 and MAT 485

MEE 351: Manufacturing Processes

MEE 434: Internal Combustion Engines

MEE 446: Energy Systems Design II

MSE 335: Materials Kinetics

MSE 415: Mathematical and Computer Methods in Materials (CS)

PHY 302: Mathematical Methods in Physics II

PHY 361: Introductory Modern Physics

PHY 462: Particle and Nuclear Physics

SER 421: Web-Based Applications

SER 422: Web Application Programming

SER 423: Mobile Systems

STP 421: Probability

STP 425: Stochastic Processes

STP 427: Mathematical Statistics

| | |
|---|---|
| DAT 402: Machine Learning for Data Science | STP 429: Applied Regression (QTRS OR CS) |
| EEE 304: Signals and Systems II | |
| 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.