















2015 - 2016 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 with Java (CS)	3	C	<ul style="list-style-type: none"> • An SAT, ACT, Accuplacer, TOEFL or IELTS score determines placement into first-year composition courses • ASU Math Placement Exam score determines placement in Mathematics course • ASU 101 or College specific equivalent First Year Seminar required of all freshman students and should be taken the first semester. • If ENG 105 is taken, a 3 credit hour applicable elective must also be taken prior to graduation. Contact CIDSE Advising.
 MAT 265: Calculus for Engineers I (MA)	3	C	
ASU 101-CSE: The ASU Experience	1		
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	
FSE 100: Introduction to Engineering	2	C	
Social-Behavioral Sciences (SB) AND Global Awareness (G)	3		
 Minimum 2.00 GPA ASU Cumulative.			
Term hours subtotal:	15		

Term 2 15 - 31 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 CSE 205: Object-Oriented Programming and Data Structures (CS)	3	C	<ul style="list-style-type: none"> • Three (3) lab science classes are required. 2 of the 3 classes must be from the same subject area or discipline.
 MAT 266: Calculus for Engineers II (MA)	3	C	
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	
Lab Science Requirement AND Natural Science - Quantitative (SQ)	4		
Elective	3		
 Complete ENG 101 OR ENG 105 OR ENG 107 course(s).			
 Minimum 2.00 GPA ASU Cumulative.			
Term hours subtotal:	16		



Term 3 31 - 47 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 CSE 120: Digital Design Fundamentals	3	C	<ul style="list-style-type: none"> • Three (3) lab science classes are required. 2 of the 3 classes must be from the same subject area or discipline.
 MAT 243: Discrete Mathematical Structures	3	C	
 MAT 267: Calculus for Engineers III (MA)	3	C	
Lab Science Requirement AND Natural Science - General (SG) or Natural Science - Quantitative (SQ)	4		
Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C)	3		
 Minimum 2.00 GPA ASU Cumulative.			

Complete Mathematics (MA) requirement.



Term hours subtotal: 16

Term 4 47 - 63 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 CSE 230: Computer Organization and Assembly Language Programming	3	C	<ul style="list-style-type: none"> Three (3) lab science classes are required. 2 of the 3 classes must be from the same subject area or discipline.
 CSE 240: Introduction to Programming Languages	3	C	
MAT 343: Applied Linear Algebra	3	C	
Lab Science Requirement AND Natural Science - General (SG) or Natural Science - Quantitative (SQ)	4		
Humanities, Arts and Design (HU)	3		
Complete CSE 110 AND CSE 120 AND CSE 205 AND MAT 243 AND MAT 265 AND MAT 266 AND CSE 230 AND CSE 240 course(s).			

Term hours subtotal: 16

Term 5 63 - 79 Credit Hours Necessary course signified by 	Hours	Minimum Grade	Notes
 CSE 310: Data Structures and Algorithms	3	C	
CSE 301: Computing Ethics	1	C	
CSE 360: Introduction to Software Engineering	3	C	
IEE 380: Probability and Statistics for Engineering Problem Solving (CS)	3	C	
Social-Behavioral Sciences (SB) AND Historical Awareness (H)	3		
Social-Behavioral Sciences (SB)	3		

Term hours subtotal: 16

Term 6 79 - 94 Credit Hours Necessary course signified by 	Hours	Minimum Grade	Notes
 CSE 340: Principles of Programming Languages	3	C	<ul style="list-style-type: none"> Please see course lists below for Technical Electives. Contact CIDSE Advising or visit the CIDSE website for additional information.
CSE 355: Introduction to Theoretical Computer Science	3	C	
CSE 4** Elective	3	C	
Upper Division Technical Elective	3	C	
Upper Division Humanities, Arts and Design (HU) OR Upper Division Social-Behavioral Sciences (SB)	3		
Term hours subtotal:	15		

Term 7 94 - 108 Credit Hours Necessary course signified by 	Hours	Minimum Grade	Notes
 CSE 485: Computer Science Capstone Project I (L)	3	C	<ul style="list-style-type: none"> Effective fall 2016, CSE 485 requires CSE 330, 340, 355, and 360 with a C or better as prerequisites. Effective fall 2016, CSE 430 changes to CSE 330.
CSE 430: Operating Systems	3	C	
Complete 2 courses:	6	C	
CSE 4** Elective	2		
Elective	2		

Term hours subtotal: 14

Term 8 108 - 120 Credit Hours Necessary course signified by 	Hours	Minimum Grade	Notes
 CSE 486: Computer Science Capstone Project II (L)	3	C	<ul style="list-style-type: none"> Please see course lists below for Technical Electives. Contact CIDSE Advising or visit the CIDSE website for additional information.
Complete 2 courses:	6	C	
CSE 4** Elective	3	C	
Upper Division Technical Elective	3	C	

Term hours subtotal: 12

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

The curriculum updates referred to in some terms of the major map occurred because the Ira A. Fulton Engineering programs are **required** by our accreditation agency ABET to follow a curriculum continuous improvement process to keep up with technology changes and feedback from industry constituents. The changes were made to better prepare students for future success in the capstone courses for the degree.

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

Lab Science Requirement	Technical Electives	Technical Electives continued
BIO 181: General Biology I (SQ)	AEE 415: Vibration Analysis	EEE 304: Signals and Systems II
BIO 182: General Biology II (SG)	AEE 426: Design of Aerospace Structures	EEE 350: Random Signal Analysis
BIO 201: Human Anatomy and Physiology I (SG)	AEE 462: Space Vehicle Dynamics and Control	EEE 360: Energy Systems and Power Electronics
BIO 202: Human Anatomy and Physiology II (SG)	AEE 463: Aircraft Propulsion	EEE 404: Real-Time DSP Systems
CHM 113: General Chemistry I (SQ)	AEE 465: Rocket Propulsion	EEE 407: Digital Signal Processing
CHM 116: General Chemistry II (SQ)	AEE 468: Aircraft Systems Design	EEE 425: Digital Systems and Circuits
GLG 101: Introduction to Geology I (Physical) (SQ) AND GLG 103: Introduction to Geology I-Laboratory (SQ)	AEE 469: Projects in Astronautics or Aeronautics	EEE 433: Analog Integrated Circuits
GLG 102: Introduction to Geology II (Historical) (SG & H) AND GLG 104: Introduction to Geology II-Laboratory (SG)	AEE 471: Computational Fluid Dynamics	EEE 434: Quantum Mechanics for Engineers
PHY 121: University Physics I: Mechanics (SQ) AND PHY 122: University Physics Laboratory I (SQ)	CSE 4** Elective	EEE 435: Fundamentals of CMOS and MEMS
PHY 131: University Physics II: Electricity and Magnetism (SQ) AND PHY 132: University Physics Laboratory II (SQ)	Except for CSE 430, CSE 485 and CSE 486	EEE 436: Fundamentals of Solid-State Devices
	CPI 411: Graphics for Games	EEE 437: Optoelectronics
	CPI 412: Cognitive Systems and Intelligent Agents	EEE 439: Semiconductor Facilities and Cleanroom Practices
	BCH 361: Advanced Principles of Biochemistry	EEE 443: Antennas for Wireless Communications
	BCH 461: General Biochemistry	EEE 445: Microwaves
	BCH 462: General Biochemistry	EEE 448: Fiber Optics
	BCH 465: Protein and Nucleic Acid Biochemistry	EEE 455: Communication Systems
	BME 350: Signals and Systems for Bioengineers	EEE 459: Communication Networks
	BME 413: Biomedical Instrumentation (L)	EEE 460: Nuclear Power Engineering
	BME 416: Biomechanics	EEE 463: Electrical Power Plants
	BME 419: Biocontrol Systems	EEE 470: Electric Power Devices
	BIO 340: General Genetics	EEE 471: Power System Analysis
	BIO 343: Genetic Engineering and Society (L)	EEE 473: Electrical Machinery
	CHE 342: Introduction to Applied Chemical Thermodynamics	EEE 480: Feedback Systems
		EEE 481: Computer-Controlled Systems
		FSE 301: Entrepreneurship for Engineers

CHE 432: Principles of Chemical Engineering Design	IEE 376: Operations Research Deterministic Techniques/Applications
CHE 442: Introduction to Chemical Reactor Design	IEE 381: Lean Six Sigma Methodology
CHE 458: Semiconductor Material Processing	IEE 385: Engineering Statistics: Probability
CHE 461: Process Dynamic Control (CS)	IEE 431: Engineering Administration (L)
CHE 462: Process Design	IEE 456: Introduction to Systems Engineering
CHE 469: Air Quality Engineering	IEE 458: Project Management
CHE 475: Biochemical Engineering	IEE 461: Production Control
CHE 476: Bioreaction Engineering	IEE 470: Stochastic Operations Research
CEE 412: Pavement Analysis and Design	IEE 474: Quality Control
CEE 423: Structural Design	IEE 475: Simulating Stochastic Systems (CS)
CEE 432: Developing Software for Engineering Applications	MAE 341: Mechanism Analysis and Design
CEE 440: Hydrology	MAE 351: Manufacturing Processes
CEE 441: Water Resources Engineering	MAE 404: Finite Elements in Engineering
CEE 452: Foundations	MAE 406: Advanced CAE Simulation
CEE 462: Unit Operations in Environmental Engineering	MAE 417: Control System Design
CEE 466: Urban Water System Design	MAE 436: Combustion
CEE 467: Environmental Microbiology	MAE 447: Robotics and Its Influence on Design
CEE 474: Transportation Systems Planning	MAE 455: Polymers and Composites
CEE 475: Highway Geometric Design	MEE 434: Internal Combustion Engines
CEE 481: Civil Engineering Project Management	MEE 446: Energy Systems Design
CEE 483: Highway Materials, Construction, and Quality	MAT Upper Division Elective
CEE 486: Integrated Civil Engineering Design (L)	Except for: MAT 300, MAT 340, MAT 342, MAT 343 and MAT 485
	PHY 361: Introductory Modern Physics
	STP 421: Probability
	STP 425: Stochastic Processes
	STP 427: Mathematical Statistics
	STP 429: Experimental Statistics (CS)
	NOTE: Maximum 3 hours CSE 484 or FSE 301. Maximum 6 hours of CSE 484, 492, 493 or 499. Some Technical Electives may require addition 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
Total Community College Hrs: 64 maximum

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)
- 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 next to courses on the major map were valid for the 2015 - 2016 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.