2022 - 2023 Major Map
Informatics, BS

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

Term 1 0 - 16 Credit Hours Critical course signified by	Hours	Minimum Grade	Notes
CPI 101: Introduction to Informatics (CS)	3	C	• ASU 101 or college-specific equivalent First-Year Seminar (ASU 101-CSE) required of all first-year students. • If ENG 105 is taken, a three (3) credit hour elective must also be taken prior to graduation. • Prep for success using the First-Year Student Guide. • Join a Fulton community. • Explore engineering and technical professions.
CSE 110: Principles of Programming (CS)	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	
MAT 210: Brief Calculus (MA) OR MAT 265: Calculus for Engineers I (MA)	3	C	
Social-Behavioral Sciences (SB) AND Global Awareness (G)	3		
Complete Mathematics (MA) requirement.			
Term hours subtotal:	16		

Term 2 16 - 30 Credit Hours Critical course signified by	Hours	Minimum Grade	Notes
CSE 205: Object-Oriented Programming and Data Structures (CS)	3	C	• Create a Handshake profile. • Get involved with EPICS, the Generator Labs, and the Fulton Start-Up Center.
MAT 242: Elementary Linear Algebra	2	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	
Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C)	3		
Lower Division Elective	3		
Complete ENG 101 OR ENG 105 OR ENG 107 course(s).			
Complete MAT 210 OR MAT 251 OR MAT 265 OR MAT 270 course(s).			
Term hours subtotal:	14		

Term 3 30 - 46 Credit Hours Critical course signified by	Hours	Minimum Grade	Notes
CPI 220: Applied Data Structures and Algorithms OR CSE 310: Data Structures and Algorithms	3	C	• Prep for success using the Sophomore Guide.
MAT 243: Discrete Mathematical Structures	3	C	

	IEE 305: Information Systems Engineering (CS)	3	C
	Natural Science - Quantitative (SQ)	4	
	Social-Behavioral Sciences (SB) AND Historical Awareness (H)	3	
!	Complete First-Year Composition requirement.		
	Complete Mathematics (MA) requirement.		
	Term hours subtotal:	16	

Term 4 46 - 62 Credit Hours Critical course signified by !	**Hours**	**Minimum Grade**	**Notes**
! CPI 200: Mathematical Foundations of Informatics (MA)	3	C	• Pursue an undergraduate research experience. • Apply for internships. • Attend career fairs and events.
! CPI 221: Advanced Object-Oriented Principles Using Java	3	C	
Informatics Focus Area	3	C	
Humanities, Arts and Design (HU)	3		
Natural Science - Quantitative (SQ) OR Natural Science - General (SG)	4		
Term hours subtotal:	16		

Term 5 62 - 78 Credit Hours Necessary course signified by ★	**Hours**	**Minimum Grade**	**Notes**
★ CPI 360: Decision Making and Problem Solving	3	C	• Students who plan to pursue the Enterprise Informatics Focus Area will need to take IEE 380 for the CS requirement. • Plan for success using the Junior Guide. • Network at student organization competitions or professional societies.
CPI 310: Web-Based Information Management Systems	3	C	
CSE 301: Computing Ethics	1	C	
GIS 270: Statistics for Geography and Planning OR IEE 380: Probability and Statistics for Engineering Problem Solving (CS) OR STP 226: Elements of Statistics (CS) OR STP 231: Statistics for Life Science (CS) OR STP 420: Introductory Applied Statistics (CS)	3	C	
Complete 2 courses: Informatics Focus Area	6	C	
Term hours subtotal:	16		

Term 6 78 - 93 Credit Hours Necessary course signified by ★	**Hours**	**Minimum Grade**	**Notes**
★ CPI 350: Evaluation of Informatics Systems	3	C	• Research and prepare for graduate school. • Develop a professional profile online.
CSE 463: Introduction to Human Computer Interaction	3	C	
Complete 2 courses: Informatics Focus Area	6	C	
Upper Division Humanities, Arts and Design (HU) OR	3		

	Upper Division Social-Behavioral Sciences (SB)		
★	Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).		
	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	• Plan for success using the Senior Guide. • Use Handshake to apply for full-time positions. • Complete an in person or virtual practice interview.
Complete 4 courses: Upper Division Informatics Elective	12	C	
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	
Complete 3 courses: Upper Division Informatics Elective	9	C	
Term hours subtotal:	12		

- ◦ Upper-Division Coursework: A minimum of 21 hours of upper-division coursework is required across the Informatics Focus Area and Informatics Elective requirements.
  - ◦ Informatics Focus Area: All Focus Area coursework must be completed from the same Focus Area.
  - ◦ Informatics Electives: It is recommended that you work with your academic advisor when making course selections.
  - ◦ For additional information on major curriculum, including Informatics Focus Area courses, please visit the Informatics Degree Requirements website.

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

Informatics Focus Area (Data Science)
CSE 450: Design and Analysis of Algorithms
CSE 467: Data and Information Security
CSE 471: Introduction to Artificial Intelligence
CSE 475: Foundations of Machine Learning
CSE 476: Introduction to Natural Language Processing
DAT 250: Data Science and Society
DAT 300: Mathematical Tools for Data Science

Informatics Focus Area (Digital Culture Studies)
Recommended first course is AME 111.
AME 111: Introduction to Digital Culture (CS)
AME 112: Computational Thinking for Digital Culture
AME 130: Prototyping Dreams (L)
AME 220: Programming for the Web
AME 230: Programming for the Media Arts (CS)
AME 240: Introduction to Physical Computing
AME 3** Elective
AME 4** Elective
ART 116: Introduction to Digital Media
ART 206: Digital Photography I

Informatics Focus Area (Enterprise Informatics)
Required courses:
IEE 376: Operations Research Deterministic Techniques/Applications
IEE 385: Engineering Statistics: Probability
IEE 470: Stochastic Operations Research
MAT 266: Calculus for Engineers II (MA)
Select One:
IEE 421: Urban Operations Research
IEE 426: Operations Research in

DAT 301: Exploring Data in R and Python

DAT 401: Statistical Modeling and Inference for Data Science

DAT 402: Machine Learning for Data Science

ART 217: Introduction to Computer Animation

ART 218: 3D Tools

ART 308: 2D Digital Animation

ART 345: Visualization and Prototyping

ART 346: 3-D Computer Imaging and Animation (CS)

ART 348: Animation Motion Studies

ART 394: Digital Photography for Non-Majors

ART 424: Stop Motion Animation

ART 440: Experimental Video Art

ART 494: Visual Prototyping

CIS 300: Web Design and Development

CPI 111: Game Development I (CS)

DCE 294: HybridAction:PhysicalIntelligenceinDigitalCulture

EDT 440: Creating and Marketing Mobile Apps

FMP 225: Introduction to Visual Effects

FMP 240: Introduction to Animation for Film

FMP 255: Media Authorship (CS)

GIT 215: Introduction to Web Authoring

GIT 230: Digital Illustration in Publishing

GRA 294: InDesign

IAP 103: Foundations I: Interdisciplinary Art Practice

IAP 104: Foundations I: Fundamentals of Sound Art

MDC 211: Introduction to Digital Sound

MDC 311: Composing and Performing for Hybrid Ensembles

Healthcare

IEE 461: Production Control

IEE 474: Quality Control

IEE 475: Simulating Stochastic Systems (CS)

IEE 477: System Dynamics and Thinking

SCM 300: Global Supply Operations

Informatics Focus Area (Game Informatics)

Fall Only Courses: CPI 311, CPI 421

Spring Only Courses: CPI 321, CPI 411

Required:

CPI 111: Game Development I (CS)

CPI 211: Game Development II

CPI 311: Game Engine Development

CPI 321: Fundamentals of Game Art

Select one:

CPI 394: Game Design Fundamentals

CPI 411: Graphics for Games

CPI 421: 3-D Modeling and Texturing

CPI 462: Design for Learning in Virtual

Informatics Focus Area (Geo-Informatics)

Required:

GIS 205: Geographic Information Science I (CS)

GIS 211: Geographic Information Science II (CS)

GIS 311: Geographic Information Science III (CS)

Select two:

ABS 485: GIS in Natural Resources

GCU 441: Economic Geography (SB)

GCU 442: Geographical Analysis of Transportation (SB)

GIS 202: Drones to Satellites: Observing Earth from Above (CS)

GIS 222: Programming Principles in GIS I

Additional Informatics Electives

Students may take additional coursework from their selected focus area or any course in another focus area as Informatics Electives in addition to the courses listed below:

AME 394: Philosophies of Technology

BIO 355: Introduction to Computational Molecular Biology (CS)

BIO 411: Quantitative Methods in Conservation and Ecology

BMI 102: Introduction to Population Health Informatics

BMI 201: Introduction to Clinical Informatics

CIS 308: Advanced Excel in Business

CIS 310: Business Data Visualization

Worlds

FMS 394: Video Games and Narrative

SER 431: Advanced Graphics

GIS 3** Elective

GIS 4** Elective

Not from GIS 484, GIS 492, GIS 493, GIS 499, GIS 494 "GIS Methods for Non-Majors"

CIS 365: Business Database Systems Development

CIS 405: Business Intelligence

CPI 394: Special Topics

CPI 441: Gaming Capstone

CPI 460: Intelligent Interactive Instructional Systems

CPI 484: Internship

CPI 494: Special Topics

CSE 220: Programming for Computer Engineering

CSE 240: Introduction to Programming Languages

CSE 259: Logic in Computer Science

CSE 294: Algorithmic Problem Solving

CSE 310: Data Structures and Algorithms

CSE 335: Principles of Mobile Application Development

CSE 360: Introduction to Software Engineering

CSE 365: Information Assurance

CSE 394: Special Topics

CSE 408: Multimedia Information Systems

CSE 412: Database Management

CSE 434: Computer Networks

CSE 445: Distributed Software Development

CSE 446: Software Integration and Engineering

CSE 460: Software Analysis and Design

CSE 464: Software Quality Assurance and Testing

CSE 470: Computer Graphics

CSE 471: Introduction to Artificial Intelligence

CSE 476: Introduction to Natural Language Processing

CSE 477: Introduction to Computer-Aided Geometric Design

CSE 494: Special Topics

FSE 301: Entrepreneurship and Value Creation

FSE 404: EPICS Gold: EPICS in Action

GIT 335: Computer Systems Technology

GIT 340: Information Design and Usability

GRA 294: Photoshop

HSE 101: Introduction to Human Systems Engineering (SB)

IEE 380: Probability and Statistics for Engineering Problem Solving (CS)

IEE 385: Engineering Statistics: Probability

MAE 318: System Dynamics and Control I

MAE 417: System Dynamics and Control II

MAT 267: Calculus for Engineers III (MA)

MAT 275: Modern Differential Equations (MA)

MAT 300: Mathematical Structures (L)

MAT 342: Linear Algebra or MAT 343: Applied Linear Algebra

MAT 421: Applied Computational Methods (CS)

SER 216: Software Enterprise: Personal Process and Quality

SER 316: Software Enterprise: Construction and Transition

SER 334: Operating Systems and System Programming

SOC 334: Technology and Society (L or SB)

STS 304: Science, Technology and Society (SB)

TEL 313: Technology in an Educational Setting

TEL 494: Introduction to Computer Science for Educators

TWC 414: Visualizing Data and Information

TWC 444: User Experience

Notes:

- First-Year Composition: All students are placed in ENG 101 unless submission of SAT, ACT, Accuplacer, IELTS, or TOEFL score, or college-level transfer credit or test credit equivalent to ASU's first-year composition course(s), determine otherwise. Students on Polytechnic, Downtown Phoenix and West Campuses are encouraged to complete the Directed Self-Placement survey to choose the first-year composition option they believe best suits their needs. Visit: https://cisa.asu.edu/DSP
- Mathematics Placement Assessment score determines placement in first mathematics course.

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 2022 - 2023 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.