

# Informatics, Certificate

ESCPICERT

The discipline of informatics makes connections between the work people do, and technology that can support that work.

## Description

The certificate program in informatics teaches students to use computer technology to gather, synthesize, store, visualize and interpret information. These skills are critical to a broad range of disciplines.

This program provides students with an understanding of the capabilities and technologies of informatics as applied to domain-specific problems in their field of study.

Students who complete the certificate are able to understand and use methods for the basic computational principles behind the operation of communication, networking and interaction; decision-making and problem-solving; modeling, inference and visualization; representing, creating and running routine activities; and storing, indexing and retrieving information.

## At a glance

- **College/School:** [Ira A. Fulton Schools of Engineering](#)
- **Location:** [Tempe](#)

## Program requirements

[2024 - 2025 Certificate Map](#)

[Certificate Map \(Archives\)](#)

This certificate requires 21 credit hours of coursework, of which at least 12 must be upper division. Students complete 15 credit hours of required courses and select six credit hours of elective coursework. All courses must be passed with a "C" or better. At least 12 credit hours must be completed in residency at ASU.

## **Required Courses -- 15 credit hours**

CPI 101: Introduction to Informatics (QTRS OR CS) (3)

CPI 200: Mathematical Foundations of Informatics (MATH OR MA) (3)

CPI 220: Applied Data Structures and Algorithms or CSE 310: Data Structures and Algorithms (3)

**Notes:** CPI 220 is only offered in Fall semesters

CPI 350: Evaluation of Informatics Systems (3)

IEE 380: Probability and Statistics for Engineering Problem Solving (QTRS OR CS) or STP 420:

Introductory Applied Statistics (QTRS OR CS) (3)

## **Elective Courses -- 6 credit hours**

AME 394: Philosophies of Technology (3)

ART 345: Visualization and Prototyping (3)

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

ART 435: Foundry Research Methods (3)

BIO 355: Introduction to Computational Molecular Biology (CS) (3)

BIO 411: Quantitative Methods in Conservation and Ecology (4)

BMI 102: Introduction to Population Health Informatics (3)

BMI 201: Introduction to Clinical Informatics (3)

CIS 300: Web Design and Development (3)

CIS 308: Advanced Excel in Business (3)

CIS 310: Business Data Visualization (3)

CIS 405: Business Intelligence (3)

CIS 407: Business Database Systems Development (3)

CPI 310: Web-Based Information Management Systems (3)

CPI 360: Decision Making and Problem Solving (3)

CPI 394: Game Design Fundamentals (3)

CPI 394: Special Topics (3)

CPI 441: Gaming Capstone (3)

CPI 460: Intelligent Interactive Instructional Systems (3)

CPI 484: Internship (3)

**Notes:** with advisor approval

CPI 494: Special Topics (3)

**Notes:** with advisor approval

CSE 220: Programming for Computer Engineering (3)

CSE 240: Introduction to Programming Languages (3)

CSE 259: Logic in Computer Science (3)

CSE 294: Algorithmic Problem Solving (3)

CSE 310: Data Structures and Algorithms (3)

CSE 335: Principles of Mobile Application Development (3)

CSE 340: Principles of Programming Languages (3)

CSE 355: Introduction to Theoretical Computer Science (3)

CSE 360: Introduction to Software Engineering (3)

CSE 365: Information Assurance (3)

CSE 394: Special Topics (3)

**Notes:** with advisor approval

CSE 408: Multimedia Information Systems (3)  
CSE 412: Database Management (3)  
CSE 445: Distributed Software Development (3)  
CSE 446: Software Integration and Engineering (3)  
CSE 450: Design and Analysis of Algorithms (3)  
CSE 460: Software Analysis and Design (3)  
CSE 464: Software Quality Assurance and Testing (3)  
CSE 467: Data and Information Security (3)  
CSE 470: Computer Graphics (3)  
CSE 471: Introduction to Artificial Intelligence (3)  
CSE 475: Foundations of Machine Learning (3)  
CSE 476: Introduction to Natural Language Processing (3)  
CSE 477: Introduction to Computer-Aided Geometric Design (3)  
DAT 250: Data Science and Society (3)  
DAT 300: Mathematical Tools for Data Science (3)  
DAT 301: Exploring Data in R and Python (4)  
DAT 401: Statistical Modeling and Inference for Data Science (3)  
DAT 402: Machine Learning for Data Science (3)  
EDT 440: Creating and Marketing Mobile Apps (3)  
ENG 374: Technical Editing (3)  
FMS 365: Video Games and Narrative (3)  
FSE 301: Entrepreneurship and Value Creation (3)  
FSE 404: EPICS Gold: EPICS in Action (3)  
GIT 135: Graphic Communications (3)  
GIT 215: Introduction to Web Authoring (3)  
GIT 230: Digital Illustration in Publishing (3)  
GIT 335: Computer Systems Technology (3)  
GIT 340: Information Design and Usability (3)  
GRA 294: InDesign (3)  
GRA 294: Photoshop (3)  
HSE 101: Introduction to Human Systems Engineering (SOBE OR SB) (3)  
IEE 380: Probability and Statistics for Engineering Problem Solving (QTRS OR CS) (3)  
MAT 267: Calculus for Engineers III (MATH OR MA) (3)  
MAT 275: Modern Differential Equations (MATH OR MA) (3)  
MAT 300: Mathematical Structures (L) (3)  
MAT 421: Applied Computational Methods (MATH OR CS) (3)  
SER 216: Software Enterprise: Personal Process and Quality (3)  
SER 334: Operating Systems and System Programming (3)  
SOC 334: Technology and Society (SOBE OR L or SB) (3)  
SOS 424: Dynamic Modeling in Social and Ecological Systems (4)  
STS 304: Science, Technology and Society (SOBE OR SB) (3)  
STS 306: Social Effects of Science and Technology (SB) (3)  
TEL 313: Technology in an Educational Setting (3)

[TWC 414: Visualizing Data and Information](#) (3)

[TWC 444: User Experience](#) (3)

Prerequisite courses may be needed in order to complete the requirements of this certificate.

## Enrollment requirements

### ASU degree-seeking students

The undergraduate certificate in informatics is available to all students who are in good standing at ASU who have completed CSE 205, MAT 242 and MAT 243 with a "C" grade or better. This certificate also may be used by interdisciplinary studies BA students as part of their degree program.

### Nondegree-seeking students

This certificate is also available through the [Pathways for the Future program](#). Applicants with or without a bachelor's degree are eligible to apply for and receive this certificate through the Pathways for the Futures program. Applicants must have completed CSE 205, MAT 242 and MAT 243, or their equivalents, with a "C" grade or higher (scale is 4.00 = "A"). Applicants who have taken these courses at another institution should use the [Transfer Guide course search](#) to determine if a transfer course can fulfill the prerequisite course requirements. Applicants who already hold a bachelor's degree should apply to ASU and this certificate program as a nondegree-seeking graduate student.

## Program learning outcomes

Program learning outcomes identify what a student will learn or be able to do upon completion of their program. This program has the following program outcomes:

- Use computational principles for information-based decision-making and problem solving.
- Apply computational principles to the operation of storing, indexing and retrieving information in informatics applications.

## Career opportunities

Students who complete this certificate should be in high demand within the software industry and in government, education, science, medicine and other fields that make use of computer technology. The certificate's applied and user-oriented focus makes graduates attractive to such employers.

## Contact information

[Computing and Informatics Program](#) | CTRPT 105

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