

COMPUTER SCIENCE/CYBER SECURITY, BS

IUP's computer science programs share a curricular core covering fundamental concepts, programming, problem solving, data structures, algorithms, software engineering, database, and seminars on technical topics and the profession. The department focuses on providing a broad foundation to create agile graduates who can adapt to the rapidly changing trends in the computer science and cybersecurity fields. Every student in the B.S. in Cyber Security track also completes a minor in criminology. Based on this program, IUP was awarded recognition as a National Center of Academic Excellence in Information Assurance Education by the National Security Agency and the Department of Homeland Security. Students get hands-on training and opportunities to delve into penetration testing and ethical hacking while completing theoretical and applied upper-level coursework in computer networking, cryptography, and information security. Courses from the Department of Criminology in loss prevention, cybersecurity, and legal aspects enable graduates to coordinate with law enforcement on cyber-crime investigations.

Cybersecurity graduates work in computing and information-related areas of law enforcement, business, industry, and government agencies. Recent graduates have found careers as cyber security analysts, information security analysts and forensic computer analysts, as well as being more traditional programmers for business applications and software developers.

Liberal Studies: 43-44

As outlined in the [Liberal Studies Requirements](#) with the following specifications:

Mathematics: 3

- [MATH 125 - Calculus I/Physics, Chemistry, Mathematics](#) Credits: 3 (1)

Social Science:

- [CRIM 101 - Crime and Justice Systems](#) Credits: 3 (2)

Liberal Studies Elective: 3

- [MATH 216 - Probability and Statistics for Natural Sciences](#) Credits: 3

Major: 48

Core Courses:

- [COSC 105 - Fundamentals of Computer Science](#) Credits: 3
- [COSC 110 - Problem Solving and Structured Programming](#) Credits: 3
- [COSC 210 - Object-Oriented and GUI Programming](#) Credits: 3
- [COSC 300 - Computer Organization and Assembly Language](#) Credits: 3
- [COSC 310 - Data Structures and Algorithms](#) Credits: 3
- [COSC 319 - Software Engineering Concepts](#) Credits: 3
- [COSC 341 - Introduction to Database Management Systems](#) Credits: 3
- [COSC 380 - Seminar on the Computer Profession and Ethics](#) Credits: 2

- [COSC 480 - Seminar on Technical Topics](#) Credits: 1

Cyber Security Required Courses:

- [COSC 216 - Introduction to Cyber Security](#) Credits: 3
- [COSC 345 - Computer Networks](#) Credits: 3
- [COSC 356 - Network Security](#) Credits: 3
- [COSC 432 - Introduction to Operating Systems](#) Credits: 3
- [COSC 473 - Software Engineering Practice](#) Credits: 3

Controlled Electives:

6cr from the following: (4, 5, 6)

- [COSC 220 - Enterprise Computing](#) Credits: 3
- [COSC 362 - Unix Systems](#) Credits: 3
- [COSC 365 - Web Application Development](#) Credits: 3
- [IFMG 468 - Information Technology \(IT\) Security](#) Credits: 3

Upper-Level Electives:

3cr from the following: (5)

- [COSC 410 - Computer Architecture](#) Credits: 3
- [COSC 427 - Introduction to Cryptography](#) Credits: 3
- [COSC 429 - Digital Forensics](#) Credits: 3
- [COSC 430 - Introduction to Systems Programming](#) Credits: 3
- [COSC 454 - Information Assurance Administration](#) Credits: 3
- [COSC 465 - Distributed Processing and Web Services](#) Credits: 3
- [COSC 493 - Internship in Computer Science](#) Credits: 6-12

Minor in Criminology: 15

(2)

Other Requirements: 3

Additional Mathematics:

- [MATH 309 - Discrete Mathematics](#) Credits: 3

Free Electives: 10-11

Total Degree Requirements: 120

(1) [MATH 125](#) can be substituted by [MATH 121](#).

(2) [CRIM 101](#) (taken as part of the social science requirement) is counted as part of the 18cr Criminology minor. Fifteen additional credits of CRIM are required.

(3) Students with 6 or more credits in [COSC 493](#) may petition the department to substitute [COSC 493](#) for [COSC 473](#). This petition must be completed prior to commencement of the internship to ensure approval of the substitution. Note: If a 6cr [COSC 493](#) is taken and not substituted for [COSC 473](#), 3cr are applied toward COSC Upper-level Electives. If a 12cr [COSC 493](#) is taken and substituted for [COSC 473](#), 3cr are applied toward the Required Courses and 3cr toward COSC Upper-level Electives.

(4) Upper-level electives may be counted as controlled electives. 3cr of Intermediate Level foreign language may be applied toward controlled electives.

(5) Controlled and upper level electives may not be applied toward more than one track in Computer Science.
