

Computer Science

Computer Science studies the representation, storage, and transformation of data into useful information using electronic computing machines. It affects practically all aspects of contemporary life. The main objects of study are digital computers and the phenomena surrounding them. Work in the discipline is focused on the structure and operation of computer systems, the principles that underlie their design and programming, effective methods for their use in different classes of information processing tasks, and theoretical characterizations of their properties and limitations. Computer Science is an extremely fast-growing and rewarding discipline. The Computer Science program at EU provides the fundamentals of the field in preparing students for immediate entry into the computer industry or for continued study at the graduate level.

Computer Science Program Learning Outcomes. Graduates of the Computer Science Program will:

1. Demonstrate the ability to, given a problem statement, develop an optimal algorithm (based upon analysis of algorithm complexity) to solve that problem and implement the algorithm in a high-order language (HOL) adhering to proper software engineering techniques. Algorithm implementation will reflect the proper selection and use of appropriate data structures.
2. Demonstrate an understanding of the underlying concepts and characteristics of real and conceptual (e.g., Turing) machines as well as the hardware comprising a computer system. This knowledge will include the hardware components and storage techniques of a general Von Neumann machine as well as knowledge concerning the basic concepts of distributed and/or parallel processing. A knowledge of peripheral hardware characteristics/processing will also be acquired.
3. Demonstrate an understanding of software comprising a computer system. This knowledge includes the basic concepts/problems/algorithms inherent in the various system software components (e.g., operating system) and how system software interacts with the hardware to perform the desired functionality.
4. Demonstrate the ability to effectively communicate technical information both orally and in writing. Students will also be able to use those communication skills to effectively contribute to a team task.

A *Computer Science major* is required to take 36 credits in computer science: CPSC 111, 211, 215, 225, 231, 311, 415, 441, 493, 497, a second high order programming language, and one upper division (300 or 400 level) CPSC elective. The major also requires BUED 275 and MATH 212. Students (especially those who plan to do post-graduate study) are also strongly advised to take MATH 231, 232, and 331.

Computer science tracks are available in Cybersecurity and Data Science. The afore-mentioned list of required courses vary slightly in each track.

A *Computer Science minor* consists of 18 credits and must include CPSC 111 and 211. The remaining 12 credits may be chosen from any CPSC electives.

Suggested program for Computer Science Major

First Year: CPSC 111, 211; MATH 212; University seminar; BIBL 111, 115; COMM 205; FIN 138; PSYC 138 or substitute; historical inquiry elective; humanities elective.

Second Year: CPSC 215, 225, 231; second higher order programming language; MATH 210; BIBL 116; reading & imagination elective; natural science; minor requirements.

Third Year: CPSC 311, 415, 441; BIBL book study; artistic expression elective; BUED 275; minor requirements; MATH 231, 232.

Fourth Year: CPSC 300/400 elective; CPSC 493, 497; THEO 320; ICST 454; natural science; minor requirements or electives; MATH 331.