

COMPUTER SCIENCE



"Millersville Computer Science prepared me for a career in the field. The faculty set me up to be a lifelong learner and gave me industry connections I will be forever grateful for."

– Josh Carney '22

As a major in computer science at Millersville, you will be exposed to state-of-the-art equipment, theory and concepts. Our faculty of highly motivated and knowledgeable professors will guide you through the courses and prepare you to join one of the most exciting and innovative professions.

BACHELOR OF SCIENCE (B.S.)

Computer science (CS) is a global, rapidly growing, and financially and intellectually rewarding discipline. Computer scientists design and develop the next generation of computer hardware and software that will be used to meet future computing needs. Many advanced technology fields, such as high-performance computing, artificial intelligence, machine learning, big data and computer security, are branches of computer science.

The computer science program at Millersville provides students with a broad and deep foundation in theory and modern software and hardware concepts as well as introduces students to numerous programming languages. In the required courses, students will have opportunities to engage in significant programming and other software engineering work. In addition, many electives in areas such as artificial intelligence, computer graphics and visualization, data science, networks, security, web development, game development and theory are offered to fulfill students' interests and allow them to develop more specialized skills.

BACHELOR OF SCIENCE (B.S.)

MULTIDISCIPLINARY STUDIES IN DATA SCIENCE

The proliferation of available data in industries such as marketing, government, education, health, science and technology (to name just a few) poses both challenges and opportunities. There is tremendous demand for skills such as data cleaning, analysis and mining so that organizations can capitalize on the wealth of information contained in the data they have collected over the past few decades.

The field of data science requires skills from computer science, mathematics and design and, therefore, is an ideal candidate for an MDST program. The ability to write programs to clean, access and manipulate data, as well as the more advanced knowledge in machine learning and artificial intelligence techniques, can be obtained through a solid background in computer science. From mathematics, statistical modeling and analysis is obviously required, but a background in linear algebra can also be tremendously useful in terms of both modeling data and

understanding many of the algorithms applied in machine learning. In order to present the knowledge gleaned from the data in an accessible and compelling way, information visualization (and hence the field of design) is important.

MINOR IN COMPUTER SCIENCE

Majors in other disciplines may require a minor in computer science.

MINOR IN DATA SCIENCE

Majors in other disciplines may require a minor in data science.

MINORS OF INTEREST TO COMPUTER SCIENCE

Since computer science impacts every discipline in some way, any minor can combine with computer science to create a career track. Here are some of the potential minors for computer science majors:

- Biology
- Economics
- Entrepreneurship
- Geospatial Applications
- Graphic Communications
- Information Technology
- Management
- Mathematics
- Music
- Physics
- Studio Art

CAREERS

A computer science student has many possibilities for a career. Our graduates may pursue graduate degrees or directly enter careers in:

- Artificial Intelligence
- Bioinformatics
- Database Systems
- Data Science
- GIS Systems
- Computer Networks
- Graphics and Game Development
- Human-Computer Interaction
- Information Science and Business Applications
- Mobile Application Development
- Scientific Computing
- Cybersecurity
- Software Engineering
- System Administration
- Web Development



FACULTY

At Millersville, your professors (not graduate assistants) teach every class. Each student is assigned a faculty advisor who acts as your mentor throughout your academic career, a responsibility our faculty takes very seriously. Faculty members are active learners, engaged in research projects that welcome and encourage student collaboration. Student/faculty research is available as an opportunity to enhance and personalize the computer science undergraduate education at Millersville.

FACILITIES

Linux Lab – One of the instructional labs, the Linux Lab, consists of 27 PCs that run Arch Linux. Installed software includes IDEs and editors such as Eclipse, Emacs and Vim. Supported languages include Java, C/C++, Python, Perl, Lisp, OCaml, Haskell, Prolog and D.

Mac Lab – One of the instructional labs, the Mac Lab, consists of 28 machines which run macOS. Installed software includes IDEs and editors such as XCode, Eclipse and Visual Studio Code. Supported languages include Java, C/C++, Swift, R and Python.

Research Lab – The research lab is directed by all faculty supervising student research. The lab contains several iMacs and PCs running Linux. All machines have high-end graphics cards to handle graphics, deep learning, data science and high-performance computing research. The lab also contains a large table for group meetings as well as group-centric seating throughout the room. The lab is also equipped with two large displays for group collaboration and presentations.

CLUBS AND ACTIVITIES

Symposium Lectures – The department presents a symposium on interesting research topics and applications of computer science.

Technology Career Network – Computer science majors organize and run a club, hosting events focused on networking and career development such as resume writing workshops and presentations by alumni and area employers.

Coding Club of Millersville University – The programming team successfully competes in state and national contests.

Cyber Defense Organization of Millersville University – The cyber defense team participates in the Collegiate Cyber Defense Competition and has qualified for nationals several times.

ACCREDITATION

The B.S. degree in computer science is accredited by the Computing Accreditation Commission of ABET, <http://www.abet.org>.

STUDENT/FACULTY RESEARCH

Student participation in research is considered an integral part of Millersville programs and provides an opportunity for students to apply their problem-solving skills to open-ended, unstructured, “real world” problems. Millersville’s Department of Computer Science has received nearly \$2 million in research funding from the National Science Foundation and other external funding agencies.

INTERNSHIPS

Many options are available for students to benefit from hands-on experience through cooperative education programs and internships. These opportunities provide valuable and practical on-the-job experience, as well as enable students to earn college credits and, in most cases, a stipend or salary.

Millersville students have completed internships with the following companies:

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| 12:34 MicroTechnologies | Meteor Tower Films, LLC |
| Aspire Ventures | Millersville University Information Technologies |
| Clark Associates | NIST (National Institute of Standards and Technology) |
| Clipper Digital/Clipper Magazine | Northrop Grumman |
| DENTSPLY International | Naval Surface Warfare Center, Philadelphia |
| DMI, Inc. | Pacific Northwest National Laboratory |
| Dell | Seisan Consulting |
| H2os Inc. | Sharp Innovations |
| Havis, Inc. | UPS |
| Hershey Foods | Voith |
| IDenticard Systems | Williams Apothecary |
| JAARS Inc. | Williams Forrest |
| KSM Technology Partners, LLC | |
| Lawrence Livermore National Laboratory | |
| Listrak | |
| M Associates | |

“The faculty cared immensely about the quality of education that I was receiving. Millersville Computer Science [also] taught me how to quickly adapt to new technologies and ways of thinking by varying the tools used in different courses.”

– Matthew Fossett '20