



# Computer Science



## Degrees

### Undergraduate

- Bachelor of Science in Computer Science (Virginia's first ABET-accredited CS program)
- Accelerated Bachelor of Science / Master of Science in Computer Science
- Post-Baccalaureate Certificate in Computer Science

### Graduate

- Master of Science in Computer Science
- Ph.D. in Engineering – Computer Science Track
- Dual Ph.D. Program with University of Cordoba, Spain
- Post-Baccalaureate Certificate in Cybersecurity
- Post-Baccalaureate Certificate in Data Science

“We are active players in a highly connected, global information-based society. Our students are ready for the **forefront of the information revolution.**”

— Krzysztof “Krys” Cios, Ph.D., D.Sc., M.B.A.  
Department Chair

## About

Computer science integrates the principles and technologies needed to collect, store and process information for today's digital computers — and tomorrow's quantum machines. In general, computer science focuses on designing algorithms for solving complex problems. The Virginia Commonwealth University Department of Computer Science has expertise in the core areas of computer science including machine learning, cloud and network security, virtual reality, blockchain, biomedical informatics, Internet of Things and data mining. Computer science graduates are in high demand and enjoy excellent employment opportunities after graduation.



## About the VCU College of Engineering

The VCU College of Engineering, an innovation front-runner in academics and research, brings real-world education to Central Virginia. Our collaborative and multidisciplinary partnerships prepare undergraduate, master's and doctoral students for leadership. Part of a premier research university, the VCU College of Engineering enhances regional and global prosperity through cutting-edge developments in tissue engineering, drug delivery, bioinformatics, cybersecurity, mechanical systems and particle science. We make it real by turning great ideas into breakthrough technologies. Our facilities are hubs of discovery, powered by an expanding student body and faculty committed to excellence. We encourage partnering with industry and the community, bringing new collaborators into our projects. Our key research areas include: sustainability and energy engineering; micro and nano electronic systems; pharmaceutical engineering; mechanobiology and regenerative medicine; big data mining and device design and development.

[computer-science.egr.vcu.edu](http://computer-science.egr.vcu.edu)

Application Deadline: **January 15**  
For Scholarship Consideration: **November 15**

**VCU College of Engineering**  
601 West Main Street  
Richmond, Virginia 23284-3068  
(804) 828 - 3925  
[askengineering@vcu.edu](mailto:askengineering@vcu.edu)





# Data Security and Resilience

Businesses rely on data to make important decisions and find their competitive advantage, which is creating complex systems and datasets. To keep data secure, computer science researchers are developing intelligent approaches to detect, predict and respond to operational failure, and to proactively recover data.

# Machine Learning

Researchers are developing learning systems capable of modeling, understanding and explaining complex, large-scale and high-dimensional data. Special focus is on new machine learning algorithms capable of scaling up to big heterogeneous data and adaptation to streaming and evolving data. The algorithms are used to solve problems in domains such as medicine, education and security.



# Internet of Things (IoT)

The benefits of IoT technology to society are huge, but its massive deployment poses several challenges to the wireless industry for successful operation of these technologies. Researchers are developing novel IoT architectures and algorithms to enable large-scale IoT deployments.

# Recommendation Systems for Software Engineering

As software continues to grow in size and complexity computer science researchers are improving developer productivity using recommendation systems, designing a new generation of such systems that learn from the completed tasks of other developers to make relevant recommendations personalized to a specific developer.

# Cryptography and Blockchain

Researchers are developing new concepts and techniques for blockchain and for secure computing, even in the extreme environments where the computing devices could be leaky or tampered with, the program codes could be subverted, the players may be coerced, or the adversaries may have quantum computing power.

# Biomedical Informatics

Structural bioinformatics is about deciphering structure and function for millions of sequenced proteins and RNAs. Researchers develop algorithms that process and understand these massive data sets with the goal of designing novel drugs and understanding how they work.

Most of the cells in our bodies are not human: they are microorganisms that live inside us. Some help us stay healthy but other may cause problems. Researchers are developing machine learning models that predict which bacterial species have negative effects on the human body. Computer science researchers are developing machine learning models that predict which bacterial species have negative effects on human body.

Computer science researchers also work on integrating systems biology simulations on genomics data with electronic health records and imaging data to design clinical decision support systems using machine learning models.



- Amazon Machine Learning Awards
- Idaho National Laboratory
- National Institutes of Health
- National Science Foundation
- U.S. Army
- U.S. Department of Energy
- U.S. Department of Transportation
- VCU Innovation Gateway