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LOYOLA
UNIVERSITY MARYLAND

Loyola College of Arts & Sciences

There's no telling where tomorrow's technology will lead—but adaptation begins with a strong foundation.

Agile methods, cloud computing, secure software engineering—you know how fast computing technology and methods change. You also know how dependent our world has become on increasingly sophisticated computer systems and software. And you see a bright future full of possibility in technology. But without an anchor in the fundamentals, it's all too easy to get lost in the daily deluge and evolution of these technologies. Loyola's graduate program in Computer Science and Software Engineering recognize the need for building a strong foundation to prepare you for the fiercely competitive environment of innovation. By mastering the fundamentals and understanding the trends, you gain the ability to solve problems both small and large from a broad perspective.

In Loyola's Computer Science and Software Engineering graduate programs, you'll gain extensive training in computing fundamentals—including object-oriented languages, skills in data structures such as advanced trees, hash tables, and graphs, along with their efficient implementation, and the problem identification and specification skills required of software engineers. Fundamental learning also includes formal techniques for describing and comparing algorithms and their complexity as well as proficiency in database integrity, consistency, recoverability, security, and efficient database design. These fundamentals and more will become second nature to you, preparing you to delve deeper into the possibilities and power of technology.

Once you've established this foundation, you'll be ready to develop an equally strong foundation in leading edge technologies. Emerging Web innovations like AJAX. Virtualization and cloud computing. Advanced human-computer interaction. Network security, information security, and secure software engineering. You can even gain experience in agile methods like SCRUM and Extreme Programming alongside other software engineering areas. And because flexibility is a key feature of our program, you have the freedom to explore your own areas of interest through independent study. A great place to start is in our robotics lab at the main campus.

Loyola's rich tradition of scholarship and distinctive approach to education will help you develop a clear competitive advantage over the masses vying for top positions in the field. One that will remain relevant no matter what the future holds. What's the advantage? The ability to think critically and independently. As any Chief Information Officer will tell you, thinkers like those who hail from our program are both rare and *a/ways* in demand.

HANDS-ON THE CUTTING EDGE.

ACTUAL— NOT VIRTUAL— PERSONAL ATTENTION.

INDUSTRY EXPERTS INSIDE OUR CLASSROOMS.

HOW OUR PAST PREPARES YOU FOR THE FUTURE.

At Loyola, we believe that learning by doing is particularly crucial where large computer systems are concerned. Our computer and software engineering labs let you apply the fundamentals in a hands-on learning environment, in real-world scenarios that can't be duplicated in any other way. The labs are filled with state-of-the-art equipment and tools to facilitate software specification, design, debugging, testing, configuration management, cost estimation, project tracking, and the building of advanced user interfaces. As well as integrated development environments and software productivity tools that prospective software system designers need to successfully navigate through the entire software development life cycle. A few of our favorite "toys" include the **sensor-fusion laboratory**, our collection of **Linux servers**, an **Xbox game development platform**, and new **iPhone development workstations**.

We also believe that fundamentals are best taught and learned through personal interaction with faculty and peers together in the classroom and the computer lab. As a Loyola student, you'll experience a high degree of personal interaction with full-time research faculty as well as affiliates who are leaders in their respective areas. It's the kind of interaction you just won't get from any online or remote learning program.

Our faculty is comprised of experts and researchers who are considered leading innovators in a variety of technology specializations. From our full-time faculty, there's Dr. David Binkley who is one of a half-dozen experts in the world in a software engineering area known as **program slicing**. Dr. Roberta Sabin has done advanced text analysis work with the National Security Agency. Not to be outdone, our part-time faculty boasts experts like Patrick Stakem—a senior technical person at **NASA's Goddard Space Flight Center (GSFC)** who builds flight-ready embedded software using virtual operating systems placed in satellites. Then there's Michael Berman, a senior software architect at **Northrop Grumman Engineering Systems (NGES)** responsible for cockpit software for the **Advanced Tactical Fighter**. These are just a few of an entire group of highly qualified faculty members who will see to it that you receive the personal attention and instruction you need to become an innovator in your own right.

At Loyola, being a graduate student in computer science isn't just about 1's and 0's. It's about academic excellence. Examining problems from many points of view. Reflection, discernment, and discovery. *Cura personalis*—the care of the whole person—mind, body, and spirit. These are the ideals espoused by the priests of the Society of Jesus—otherwise known as the Jesuits. They have guided Loyola University for more than 150 years. And those same Jesuit values play an important role in our Computer Science and Software Engineering graduate program.

This unique philosophy has produced accomplished scholars and deep thinkers for hundreds of years. Within the Computer Science and Software Engineering program, it continues to create more fully formed individuals. Students who become infinitely adaptable. Who can make significant contributions to technological and societal advancement. Using this method of education, you'll become distinctly prepared to make a difference in the world. To guide. To teach. To become an ethically motivated leader, engaged not just in the improvement of your chosen profession, but the world at large. Which is why we provide direct outlets for altruism with opportunities such as volunteering in the Center for Community Informatics, a Loyola-sponsored group that provides computer and Internet services to remote areas around the world.



MASTER OF SCIENCE (M.S.) IN COMPUTER SCIENCE

The **Computer Science** program offers in-depth, hands-on assimilation of technologies that facilitate the design and development of computer programs and systems: languages, databases, web techniques, operating systems, etc. You'll explore advanced technologies and techniques, and you'll gain a solid grounding in fundamentals through our emphasis on usable, practical knowledge backed by essential theoretical underpinnings.

Those who want to expand their learning beyond the required coursework can take advantage of extra-curricular events such as our Advanced Technology Forum and Center for Community Informatics (CCI), as well as opportunities to write articles for the Loyola Computes newsletter (www.loyola.edu/loyolacomputes).

Upon graduation, you will know how to analyze algorithms for space and time limits, properly build and test asynchronous systems, and design and implement databases, among other core competencies. The emphasis in the core curriculum is in software design, systems integration, and advanced data structures.

Our Computer Science program is open to qualified applicants with any undergraduate degree, whether they have prior experience working in the industry, or are seeking to enter the program to make a career change.

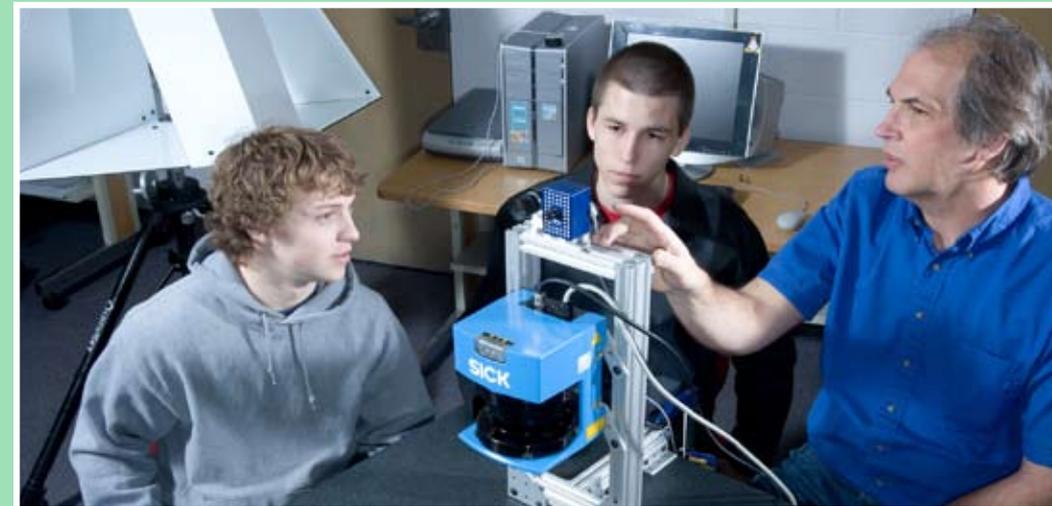
FORMAT

Courses are offered in the evening for the convenience of working professionals, though full-time enrollment is also possible. Courses are in person, to maximize personal interaction between students and instructors and held at Loyola's Columbia and Timonium graduate centers.

CURRICULUM

For complete information about the curriculum, course listings, and program requirements for the M.S. in Computer Science program, please visit:

Loyola.edu/grad/cs
and click Graduate.



MASTER OF SCIENCE (M.S.) IN SOFTWARE ENGINEERING

Like the **Computer Science** program, the **Software Engineering** program is a hands-on program—focusing on technologies and processes that help to more effectively and efficiently specify, develop, and test software.

The process of developing and maintaining large-scale, software-based systems is complex. It involves detailed analysis, sophisticated techniques, and a sense of how the system interacts with other entities. The **Master of Science in Software Engineering** (MSSE) program trains professionals to master and manage this complexity. It is the only advanced degree of its kind in the Baltimore area. Graduates will be skilled in all aspects of large-scale software system design and implementation, including but not limited to:

- Developing high quality integrated software solutions for large corporate problems.
- Leading a project development team by structuring environments and events, and by wisely allocating technical and human resources.
- Effectively communicating with people as well as the machines they use.

A unique palette of graduate courses offered by Loyola's Sellinger School of Business and Management are available to MSSE students. From ethics and social responsibility, to project management and information systems security, this collaboration provides software engineers with an unmatched view of the corporate environment.

The MSSE program is designed for those who are currently practicing in the field or have a background or training in computing.

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VALUE ADDED. AND ADDED. AND ADDED.

The significant financial advantage a graduate degree from Loyola represents is only a small part of the story. Loyola brings together all the pieces of your potential—your intellect, interests, talents, personality—and transforms them into one balanced whole. Your mind, body, and spirit combine to create a distinct, holistically prepared, confident leader who can infinitely adapt and thrive in an ever-changing world—with the foundation to succeed not only in a technology career, but in every aspect of your life. As a graduate of Loyola's College of Arts and Sciences, you will have gained all the experience you will need to make a positive impact on your family, friends, and the world at large. In short, a Loyola education offers value that can hardly be commoditized.

LOCATION

As you would expect of a leading Computer Science program like Loyola's, our facilities house state-of-art classrooms at our conveniently located Graduate Centers—one in Timonium in the northern Baltimore suburbs, and a new center in Columbia, just 20 minutes from the D.C. suburbs. Both of these centers feature multiple types of projection and sound equipment, sophisticated technology and 24-hour access to labs and meeting rooms, as well as ample free parking, and places to make copies, check e-mail, and grab a quick snack.

FINANCIAL ASSISTANCE

The largest form of financial aid for graduate study comes in the form of federal student loans. The department has a limited number of employment opportunities available through graduate assistantships, or students may apply to other campus administrative departments for a graduate assistantship. A list of all graduate assistantship opportunities is available online at:

Loyola.edu/cas/assistantships

Students who wish to be considered for a graduate assistantship should contact the department during the admission process. The application procedures for federal student loan assistance are available on the graduate financial aid Web site:

Loyola.edu/financialaid/graduate

FINANCIAL AID THROUGH LOYOLA

Loyola's office of financial aid administers several types of financial assistance for graduate students from federal, state, departmental, and private sources.

Loan assistance is available through the William D. Ford Direct Loan Program. Assistantships are available through several academic and administrative departments. Additionally, individual departments offer a limited number of merit-based and need-based grants to assist students with their educational expenses.

You can learn more about the financial aid options available to you by visiting the office of financial aid Web site:

Loyola.edu/financialaid

APPLICATION INFORMATION

Individuals interested in applying for admission to the graduate programs in Computer Science and Software Engineering are offered a variety of ways to complete the process. For your convenience, you can apply directly online, or use our downloadable application forms that are available online in PDF (Adobe Acrobat version 3.0 required). You can also request a viewbook or brochure to be sent to you by first class mail. To access our application forms, and review the steps and required documentation for admission, please visit our application pages online at:

Loyola.edu/grad/cs

If you have questions about the graduate program in Computer Science and Software Engineering, please contact us to speak with a program director.

Evergreen Campus-Donnelly Science Center

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ABOUT LOYOLA UNIVERSITY MARYLAND

Founded in 1852, Loyola University Maryland is a Jesuit Catholic university whose mission is to inspire students to learn, lead, and serve in a diverse and changing world. It is committed to the educational and spiritual traditions of the Society of Jesus and to the ideals of liberal education and the development of the whole person. The University was named for St. Ignatius Loyola, the founder of the Jesuit order of Catholic priests, and is one of four universities in the United States to bear the name "Loyola."



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