



Graduate program in
COMPUTING



MARQUETTE
UNIVERSITY

Be The Difference.



Why a master of science in Computing at Marquette?

Was your undergraduate degree in something other than computer science and you now find yourself needing broader and more substantial exposure to computer technology to open up possibilities for career advancement? Or have you discovered a passion, aptitude and interest in computing? This program — the only of its kind in Wisconsin — is designed for you.

ABOUT MARQUETTE

Our programs. Marquette offers 50 doctoral and master's degree and more than 30 graduate certificate programs, and a School of Dentistry and Law School. And we have a variety of specializations to help you tailor the curriculum to your needs — an opportunity not offered by all universities.

Our students. We enroll approximately 3,700 graduate and professional students from diverse cultural and educational backgrounds and 68 countries all over the world.

Our faculty. Marquette's almost 700 full-time faculty represent renowned scholars and industry experts. As a student, you'll also benefit from established collaborations within the local business and nonprofit communities, as well as other nationally renowned institutions within the region, including the Clinical and Translational Science Institute, Medical College of Wisconsin, Milwaukee School of Engineering, University of Wisconsin system, and others.

Our research. Graduate students can participate in important research alongside our renowned faculty members — making you a contributing member of our research team, not just a face in the crowd like at some other universities. Marquette's overall research award volume in fiscal year 2010 reached a record high, with faculty receiving more than \$28 million. Federal award dollars increased by 81 percent, and the average award size rose by 45 percent.

Our commitment. Class sizes are small and are usually taught by regular faculty members who are conducting cuttingedge research. Your teaching will be informed by current research, and you will often have the opportunity to participate in research.

Our network. As a graduate of Marquette, you'll become part of our alumni family of 110,000 around the world — creating a professional network that spans from right next door to across the globe.

Our values-based education. As a Jesuit institution of higher education, Marquette continues a centuries-old tradition of academic excellence, development of the whole person and research that addresses societal needs.

Be in demand. [WORKnet](#), Wisconsin's workforce and labor market information system, says computing is one of the fastest-growing occupations, according to projections through 2016. Job growth for network and data communication analysts will be more than 43 percent and more than 37 percent for computer software engineers. Many employers in these fields prefer to hire and promote individuals with graduate degrees.

Be curious. The prospect of changing careers can be intimidating, so our classes are designed to help you rapidly reach technical competency to ease the transition into your studies. Plus, you can explore other areas of interest with course options and electives in the [departments of Mathematics](#), Statistics and Computer Science and [Electrical and Computer Engineering](#) and the College of Business Administration's information technology program.

Be comfortable. The first courses you'll take provide a broad exposure to computer science. In a few semesters, you'll gain the background to discuss virtually any aspect of computer technology with confidence.

Be connected. Class sizes are small, meaning individualized attention. Faculty members take a real interest in the career goals of their students.

Be flexible. Our program is designed to meet the needs of working professionals and full-time students. Class times are flexible.

YOUR JOURNEY

Wisconsin's [WORKnet](#) lists network systems and data communication analyst positions as the fastest-growing occupations from 2006-16. This growth, combined with reduced enrollments in computer science undergraduate programs, means opportunities for career changes are outstanding. Expect to be in demand by several industries, including academia; administration and waste services; enterprise and management; the financial and insurance industries; health care and social assistance services; information technology providers; manufacturing, professional and technical services; retail trade; utilities; and more. Are you ready for a change and the career success it can bring?

Master of science

Applicants (2011): 48

Admitted (2011): 24

Course work:

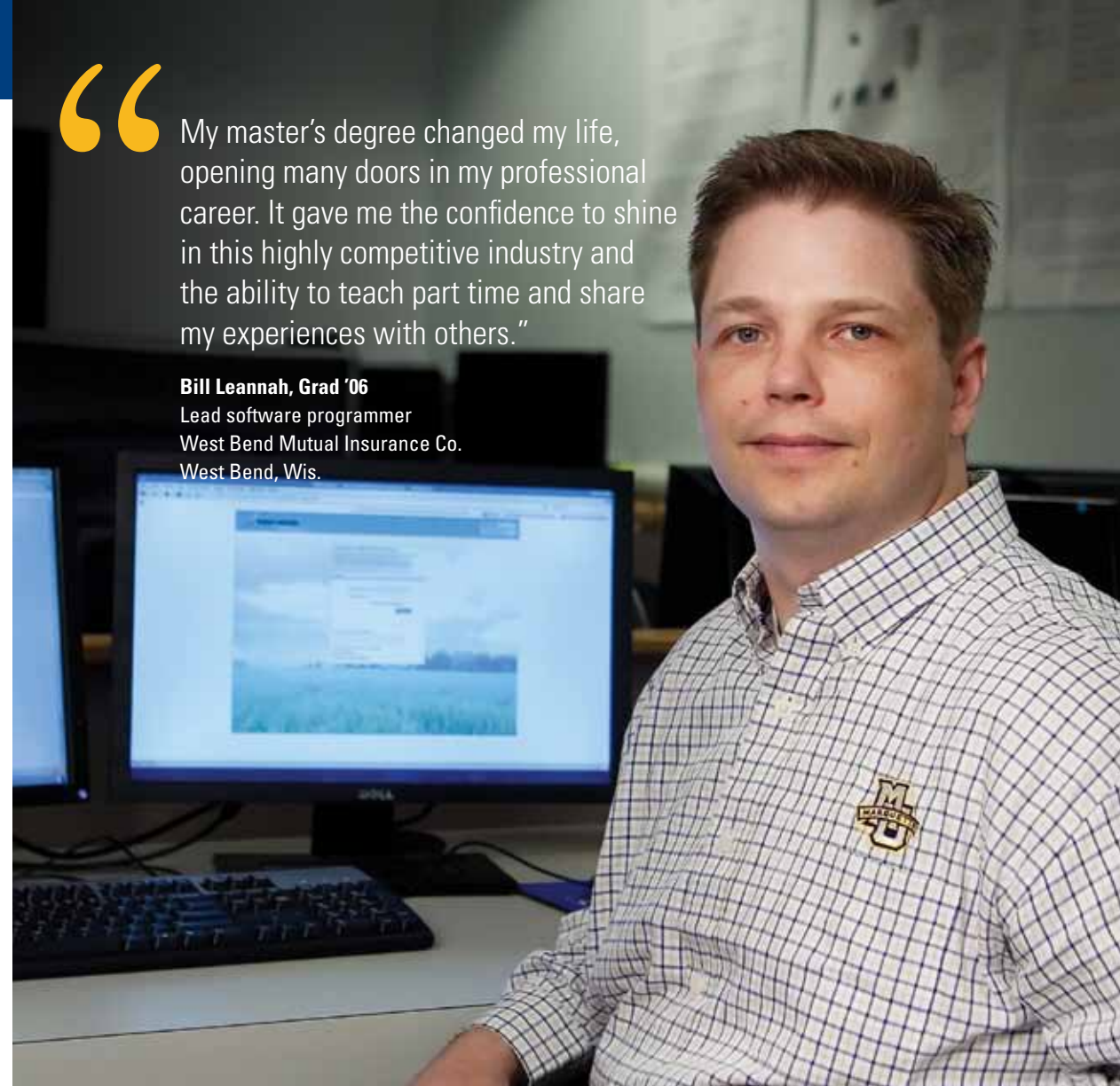
- [Non-thesis program](#)
 - Students complete [36 credit hours](#) (12 classes) of course work, of which at least 18 credit hours (six classes) are earned in graduate-level courses (6000 level or higher).
- [Thesis program](#)
 - Students must request a transfer into the thesis program.
 - Students complete [30 credit hours](#) (10 classes) of course work, of which at least 12 credit hours (four classes) are earned in graduate-level courses (6000 level or higher), and six thesis credits.
- Students select a primary and secondary concentration from available options.
 - Numerous concentration choices are available, including foundations of computing; distributed computing; software engineering, programming concepts and skills; intelligent systems and information management; and architecture and organization.
- Students complete 12 credit hours (four classes) of foundation classes designed to expose them to the terminology and foundations of the field. Students choose from courses in information management; architecture and organization; operating systems; programming concepts and skills; and software engineering.
- Students complete [18 credit hours](#) (six classes) in their chosen concentration.

“

My master's degree changed my life, opening many doors in my professional career. It gave me the confidence to shine in this highly competitive industry and the ability to teach part time and share my experiences with others.”

Bill Leannah, Grad '06

Lead software programmer
West Bend Mutual Insurance Co.
West Bend, Wis.



- [Six out-of-program elective credits](#) (two classes) may be selected from other Marquette graduate courses germane to computing or its applications, including engineering management, signal processing, simulation, finance and geology, among others.
- Most students are part time, taking three to six credits (one to two classes) each semester.
- Full-time students are required to take seven to nine credit hours (two classes plus a seminar or three classes) each semester.

Comprehensive examination and thesis requirements:

- Thesis program
 - Students complete a six-credit-hour master's thesis and pass an oral examination concentrating on the thesis.
 - The six-credit thesis hours are considered a secondary concentration.

Scheduling:

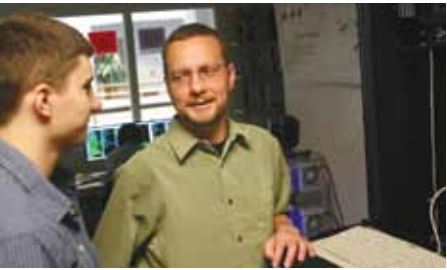
- Most courses are offered in the evenings or Saturday mornings.

For more program details, including requirements and course descriptions, see the *Graduate Bulletin* at [marquette.edu/grad](#).



Marquette's Graduate School produces a monthly newsletter for all graduate students. Visit [marquette.edu/grad/news-ews](#) to read about what's going on this month.

YOUR FACULTY MENTORS



Dr. Sheikh Iqbal Ahamed, associate professor
Ubiquitous computing, middleware, component-based software engineering, ad hoc networks

Dr. Dennis Brylow, assistant professor
Software engineering, real-time and embedded systems

Dr. George Corliss, professor
Software engineering, numerical analysis, software quality

Dr. Rong Ge, assistant professor
Computer architecture, energy-aware computing, high-performance computing, computer networks

Dr. J. Douglas Harris, professor
Computer networks, distributed architectures, topology

Dr. Thomas Kaczmarek, adjunct faculty and director
Software engineering, software quality and testing

Dr. Kate Kaiser, associate professor
IT workforce skills, offshore outsourcing

Dr. Praveen Madiraju, assistant professor and co-op coordinator
Databases, middleware, schema evolution, data models, mobile agents

Dr. Craig Struble, associate professor
Bioinformatics, data and text mining, microarray data analysis

Dr. Craig Walker, adjunct faculty
Enterprise architecture and security

For more information about the department's faculty members and their research, visit marquette.edu/computing/faculty.

FACULTY RESEARCH

The computing program has six research labs run by internationally recognized faculty and used by students, including:

Bioinformatics Lab

Dr. Craig Struble

This lab applies machine learning and algorithmic techniques to biologically motivated questions. A central interest is the application of high-performance computing to these problems. Projects include microarray data analysis and modeling — analyzing and interpreting microarray data for problems in RNA regulation, toxicology, and DNA transcription and biomedical text mining; automated information extraction and representation from scientific literature; and virtual screening for drug design — screening compounds for their potential as pharmaceuticals. Work is in collaboration with the Medical College of Wisconsin, Marquette's Department of Biological Sciences and the Great Lakes WATER Institute.

Computer Networks Lab

Dr. J. Douglas Harris

This lab explores protocols in network communication, patterns of protocols, separation of concerns and protocol design.

Database Lab

Dr. Praveen Madiraju

The database lab is dedicated to conducting research in theoretical and system aspects of databases. There are many potential areas that will benefit as a result of the research carried out in this laboratory, such as information systems, health care, bioinformatics and others.

GasDay Lab

Dr. Ron Brown, director, Dr. George Corliss, Tom Quinn and others

GasDay forecasts natural gas consumption for about 20 U.S. energy delivery companies. It builds mathematical models, performs statistical analysis of data, develops software, delivers that software to customer utilities and provides ongoing customer support. Participating faculty come from the colleges of Engineering and Business Administration, the Milwaukee School of Engineering, and the University of Wisconsin–Milwaukee. More information is available at gasday.com.

High-performance Computing Lab

Dr. Rong Ge

One of this lab's research interests is creating software and hardware techniques to measure and control emergent power-aware capabilities on real systems. Another project involves creating formal mathematical and statistical techniques to model, predict, and explain the whys and hows of performance on real systems.

Systems Lab

Dr. Dennis Brylow

The lab creates new tools and methods for building and studying complex computer systems. Our emphasis is on embedded, real-time and network systems, with strong ties to the electrical and computer engineering community and computer science education community.

UbiComp Lab

Dr. Sheikh Iqbal Ahamed

This lab focuses on the research issues in pervasive/ubiquitous computing systems and applications.

For more information about the department's faculty members and their research, visit marquette.edu/computing/faculty.

“Marquette's computing program gave me exactly what I needed to advance to the next level in my career. It was one of the best choices I have ever made.”

David A. Stern
Student
Principle engineer/technologist GWS-IT
Johnson Controls — Building Efficiency Group
Milwaukee



YOUR RESOURCES

As a graduate student in the computing program, you'll have access to:

- the MUGrid, a large cluster of computers anchored by a 1,000-node HP supercomputer, installed in 2009.
- multiple research labs supported by campus-wide licenses for Matlab, Maple and other computational software at the university.
- adjunct faculty with significant industrial and commercial computing experience.
- a network of students and alumni from the computing program.

Our graduate programs also provide excellent resources beyond the classrooms. Thanks to our location in downtown Milwaukee and community-connected faculty, you'll enjoy an urban setting with access to a vibrant arts scene, professional sports, restaurants and nightlife.

Marquette University

- Access to networking, career counseling, and job searching counselors and seminars through our free [Career Services Center](#)
- More than 20 academic centers and institutes that foster research in end-of-life care, ethics, neuroscience, rehabilitation engineering, transnational justice, water quality, sports law and others
- Access to more than 1.7 million volumes of books and bound journals, 22,000 journals and other serials in digital format, laptops for checkout, and extensive special collections ([Raynor Memorial Libraries](#) are open evenings and weekends)
- Access to a secure high-speed wireless network (54Mbps) for laptops and other devices
- Remote computer access to campus-only resources through our VPN
- [Student Health Service, Counseling Center](#) and [Campus Ministry](#)
- [Sports recreation](#) and fitness facilities
- [Big East Conference sports](#), including men's basketball, which has 27 NCAA appearances, 14 Sweet Sixteen appearances, three Final Four appearances and one NCAA championship (1977) and plays in front of 18,000 fans at the Bradley Center

Milwaukee

- The Milwaukee metropolitan area has approximately 1.7 million people, ranking among the top cities in the United States by population
- Home to 9 fortune 500 company headquarters, including Harley-Davidson, Johnson Controls, Northwestern Mutual and Rockwell Automation
- Milwaukee offers many art and cultural opportunities, including a [repertory theatre](#), a [symphony orchestra](#), two opera companies, a [ballet company](#), diverse art galleries, [a public museum](#), the [Milwaukee County Zoo](#) and the [Milwaukee Art Museum](#)
- Professional sports include baseball ([Brewers](#)), basketball ([Bucks](#)), hockey ([Admirals](#)), soccer ([Wave](#)) and skating exhibitions at the [Pettit National Ice Center](#) (an Olympic training facility)
- Known as the city of festivals, Milwaukee has abundant celebrations throughout the year honoring the city's diverse heritage, including [Summerfest](#) — the world's largest outdoor music festival
- More than 10 miles of lakefront, 1,500 restaurants and 15,000 acres of parks

YOUR INVESTMENT

Furthering your education is an investment you can count on. Financial aid — in several forms — can help meet the costs of your graduate education at Marquette.

Tuition*

For full-time students:

Nine credit hours per semester at \$945 per credit = \$8,505 per semester

For part-time students:

Three to six credits per semester at \$905 per credit = \$2,715 to \$5,430 per semester

A minimum of 36 credit hours is required to complete the non-thesis master's program.

A minimum of 30 credit hours plus six thesis credits is required to complete the thesis master's program.

*Figures provided are based on average credit hours taken per semester and exclude service fees and/or continuous enrollment/continuation course fees. Per-credit cost valid until May 2012.

Need-based aid

Enroll as a half- or full-time student in a degree program (at least four credit hours, usually two or more classes a semester), and you may be eligible for loans distributed through the Office of Student Financial Aid. Most student loans have competitive interest rates and do not require repayment until after you complete your course of study.

To apply, file the Free Application for Federal Student Aid each year between January 1 and mid-February. It's available from the Office of Student Financial Aid or at [fafsa.ed.gov](#). Once you have been admitted to your program and completed your financial aid paperwork, we will determine your eligibility and send you a notice explaining what financial aid you are eligible to receive from the university.

Additional resources

- Marquette offers a convenient payment plan that divides tuition costs into monthly installments. For more information, visit [marquette.edu/mucentral](#) or contact Marquette Central at (414) 288-4000.
- [Employment assistance](#) is available.
- Private lenders feature special educational loans.
- Your employer may offer a tuition-remission plan.
- Some private foundations offer financial aid for graduate study.
- Tax credits can be claimed for work-related educational expenses.

YOUR OPPORTUNITIES

Milwaukee is the world headquarters for several major corporations that rely heavily on computing, information technology and software engineering. Employees of these companies regularly become students in our programs to help their organizations achieve technical leadership and enhance their careers.

The companies include:

- GE Healthcare
- Harley-Davidson
- Johnson Controls
- Northwestern Mutual Insurance Corp.
- Rockwell Automation

Students also come from medium-sized companies that depend on computing, including:

- Direct Supply
- Wells Fargo (formerly Strong Funds)
- West Bend Mutual Insurance Corp.

Graduates of our program have moved into high-ranking positions at these companies because of the skills they gained and the networks they established at Marquette.

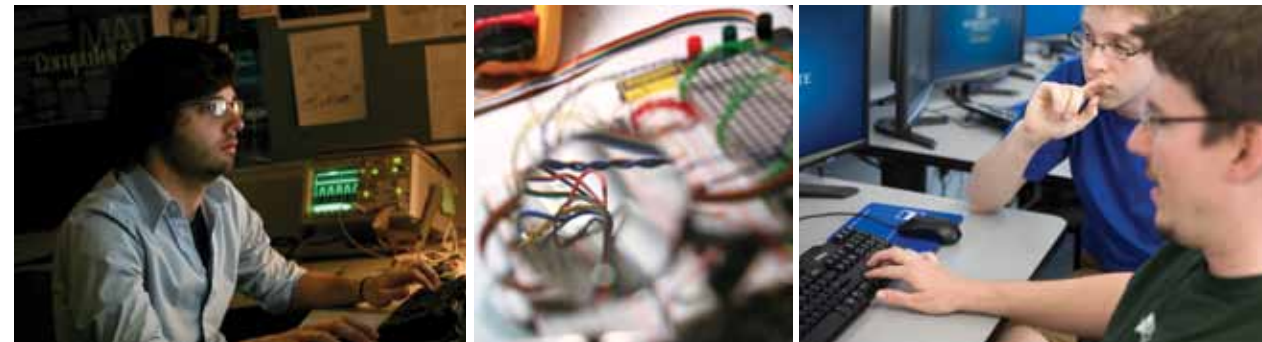
YOUR FIRST STEP

We invite you to apply.

Application requirement checklist

- Online application at marquette.edu/grad (must be submitted online before all other admission materials)
- Application fee
- Official transcripts from all current and previous colleges/universities except Marquette
- Three letters of reference from professors or professionals familiar with applicant's abilities, academic work and/or professional background
- Essay outlining relevant work experience or education, career goals, possible areas of interest and reason for seeking admission to the program
- (For international applicants only) TOEFL score or other acceptable proof of English proficiency; English-language publications authored by the applicant, including a master's thesis or essay, if applicable (optional, but strongly recommended)
- If necessary, submit any additional hard-copy materials in one envelope to:

Marquette University Graduate School
P.O. Box 1881
Milwaukee, WI 53201-1881



“Our classes teach you how to use the concepts of computer science, especially networking and distributed computing, to build something — and to build something that somebody really cares about. One of our measures of quality of instruction is what graduates are able to accomplish in their work, perhaps several years after completing our program.”

Dr. George Corliss
Professor
Marquette University

We invite you to speak with a faculty member.

Dr. Thomas Kaczmarek
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E-mail: thomas.kaczmarek@marquette.edu



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Marquette University Graduate School

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marquette.edu/grad